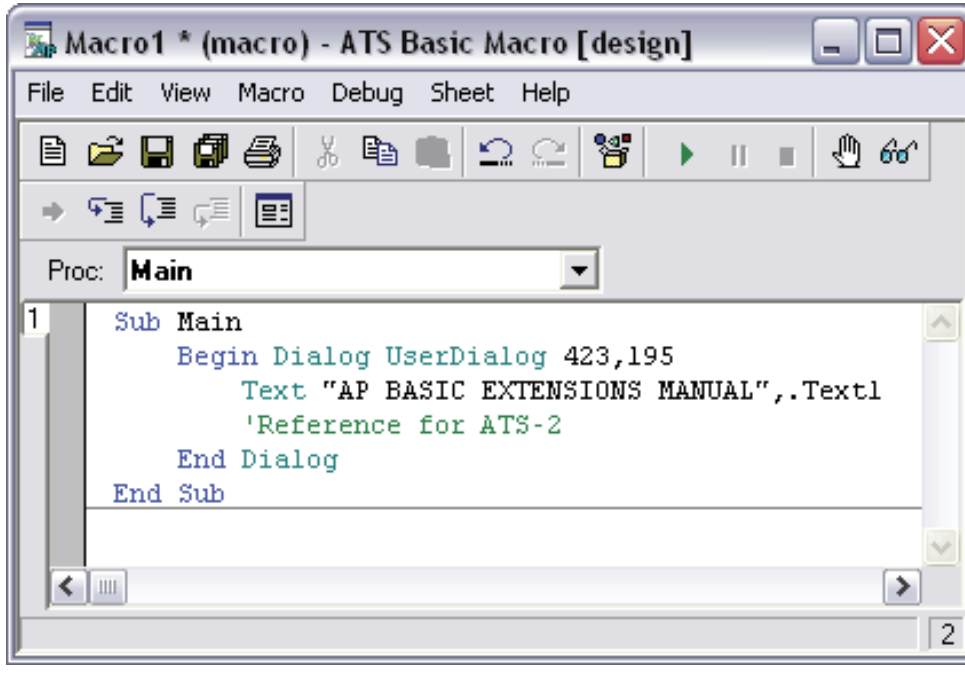
ATS-2

AP Basic Extensions Manual for the ATS-2



Audio precision

AP Basic Extensions Reference for ATS-2

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ATS Versions 1.6

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Sweep

Chapter 1

ATS Extensions Reference

Introduction

This chapter of the manual is divided into three sections.

The first section consists of ATS system panels listed alphabetically by panel title. Each page consists of one or more panels and the commands applicable to each panel.

The second section consists of an alphabetical listing of all AP Basic extensions.

The third section consists of technical reference information for the command extensions sorted alphabetically. Each command contains many of the following parts.

Name	Description
Syntax:	Programming usage information.
Command type:	Method or Property
Data type:	Setting Data Type.
Result:	Query Data Type.
Description:	Technical Information.
See also:	Commands related to the current command that may contain relevant information.
Example:	Example procedure/macro
Example Output:	When an example program produces output to the immediate window of the Procedure/Macro Editor or output to a file a sample of what the output will be shown in this location.
Comments:	Additional information relating to the example procedure/macro.

Manual Conventions

This manual uses the following typographic conventions.

Example	Description
event, *var, arg*	For the syntax part of each command, italicized words indicate place holders where the user must enter additional information.
`FILENAME.TXT`	Words in all CAPITOL letters indicate file names.

`Sub Main`
`  ATS2.AGen.Amp = 1.0`
`End Sub`
	This font is used in all example macros and code modules.

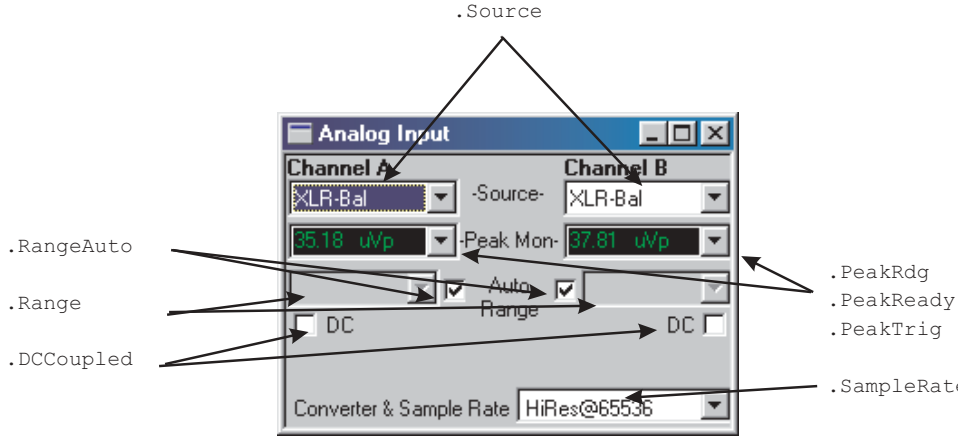
[*expression list****]***	In syntax, items inside square brackets are optional.
{*While* **|** *Until****}***	In syntax, braces and a vertical bar indicate a choice between two or more items.
Command	For the syntax part of each command, the bold characters identify the part of the command that must be entered.
`ATS.Prompt. _` `  Text "Example"`	The line continue character (_) is used to indicate that the code from one line to the next should be typed on one line.

Chapter 2

System Panels

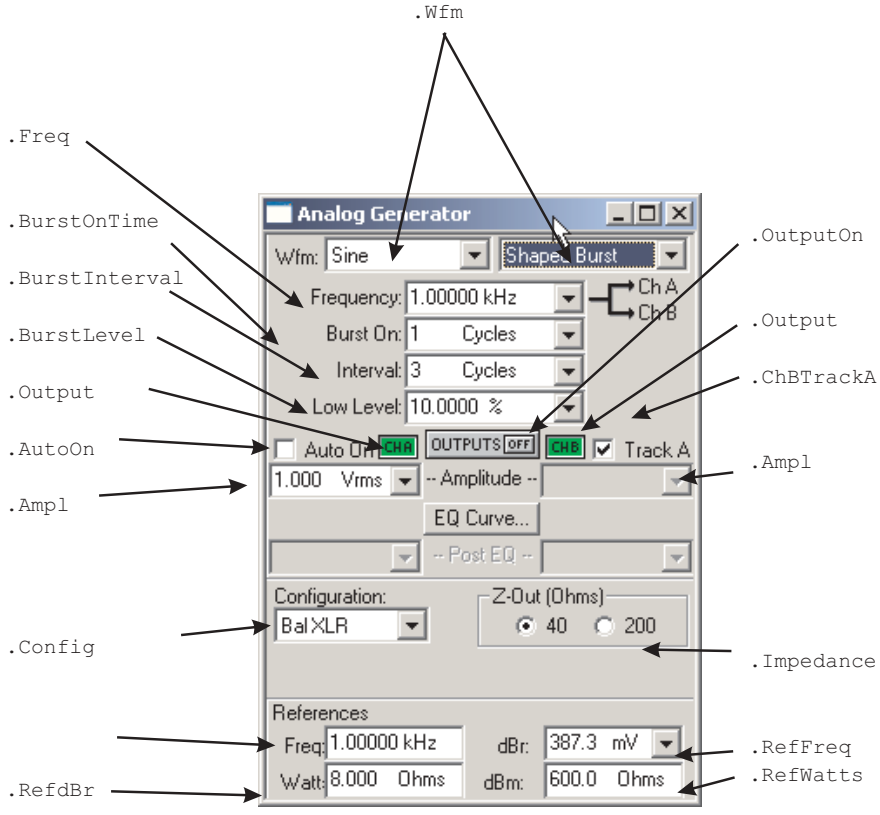
Analog Input

All commands on this page start with the following:
ATS2.AnalogIn
Example: ATS2.AnalogIn.DCCoupled



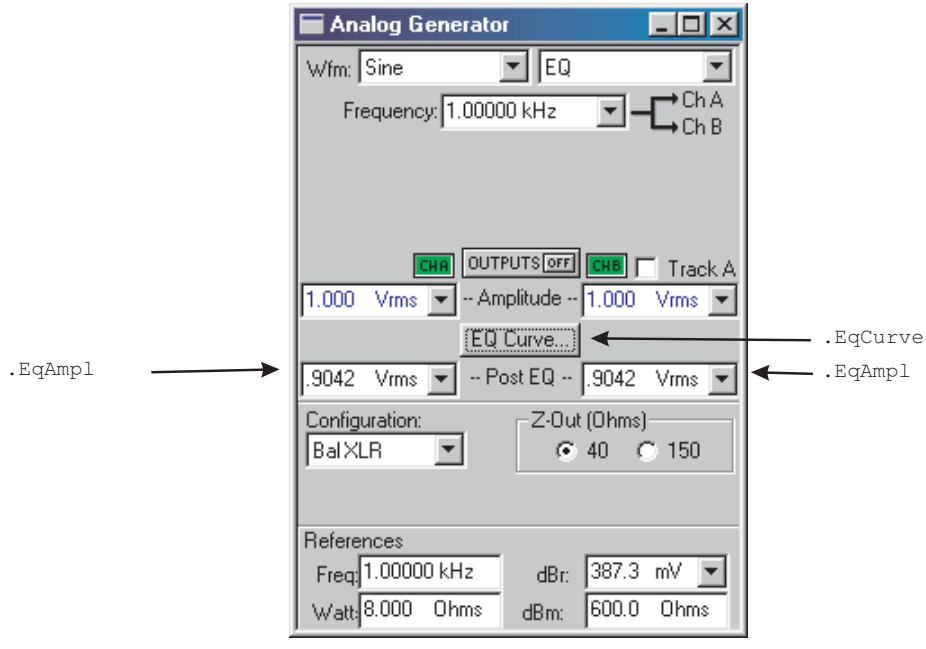
Analog Generator ...

All commands on this page start with the following:
ATS2.AGen
Example: ATS2.AGen.Freq



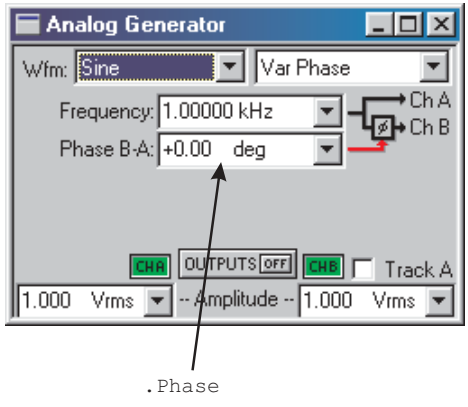
Analog Generator Continued ...

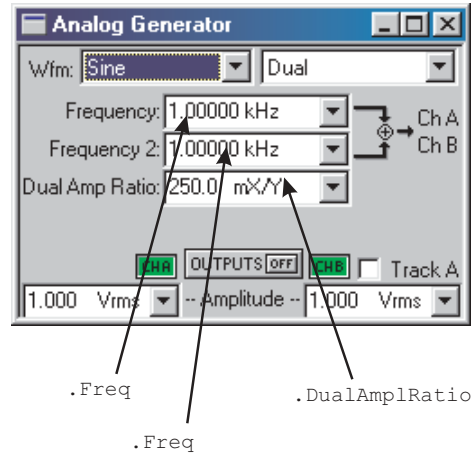
All commands on this page start with the following:
ATS2.AGen
Example: ATS2.AGen.EqAmpl

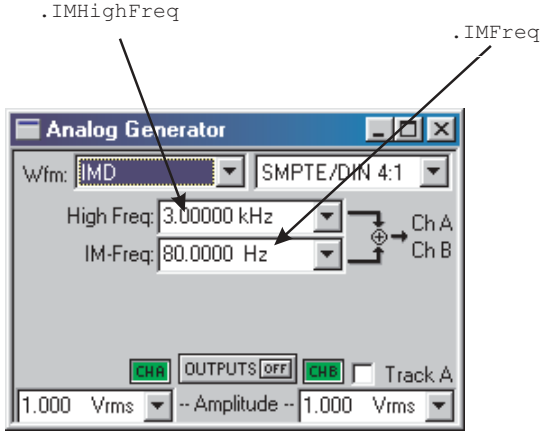


Analog Generator Continued

All commands on this page start with the following:
ATS2.AGen
Example: ATS2.AGen.Phase

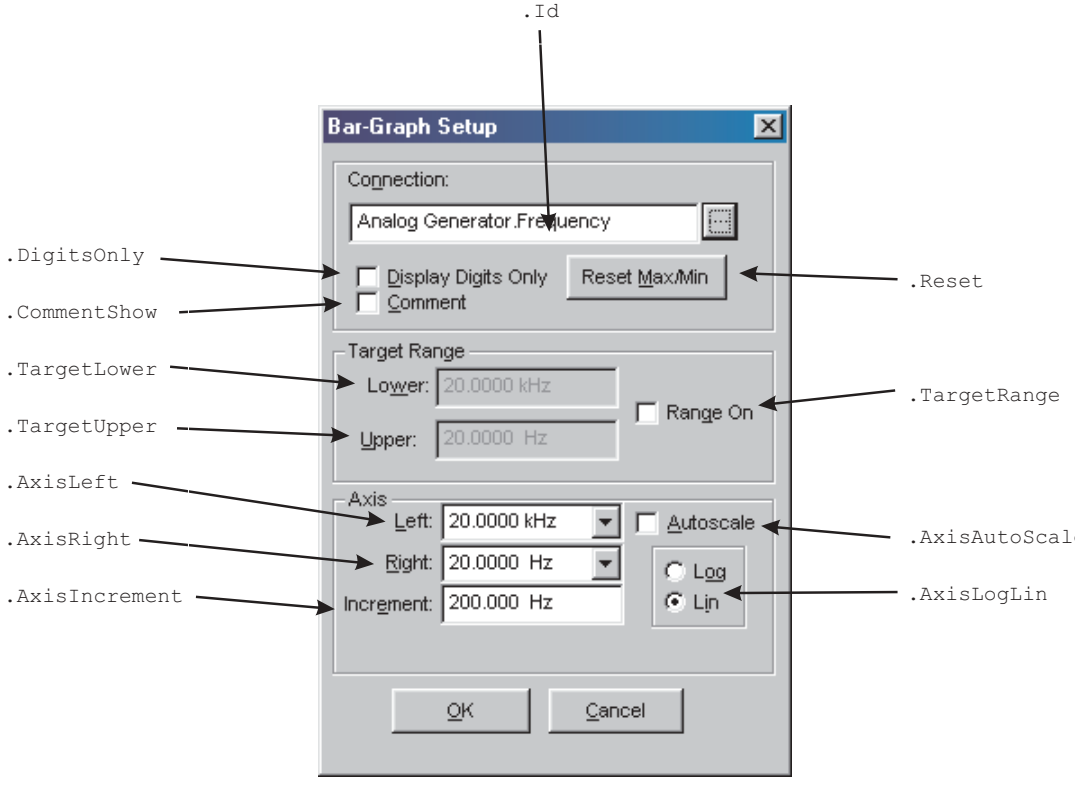






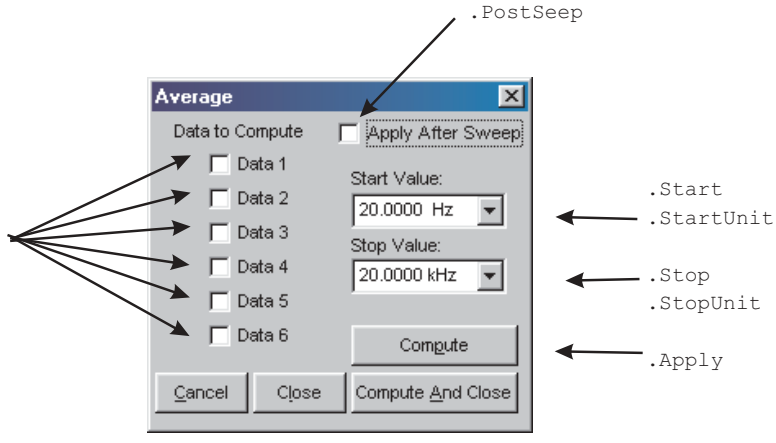
BarGraph

All commands on this page start with the following:
ATS.Bar
Example: ATS.Bar.DigitsOnly

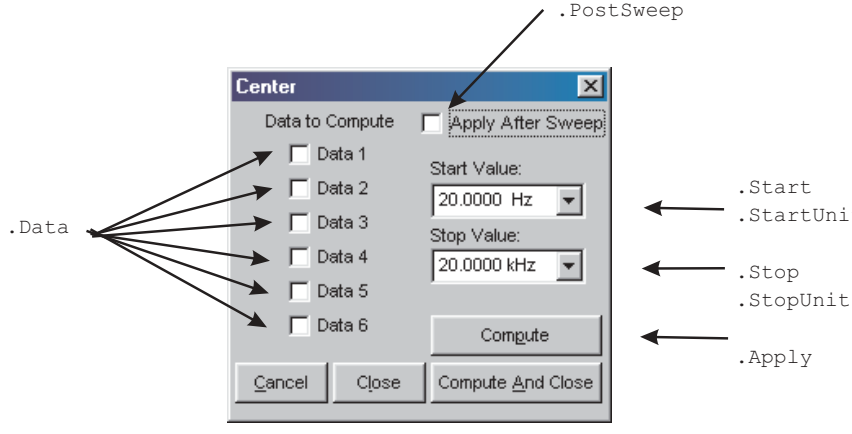


Computes ...

All commands for the top diagram start with the following:
ATS.Compute.Avg
Example: ATS.Compute.Avg.Apply

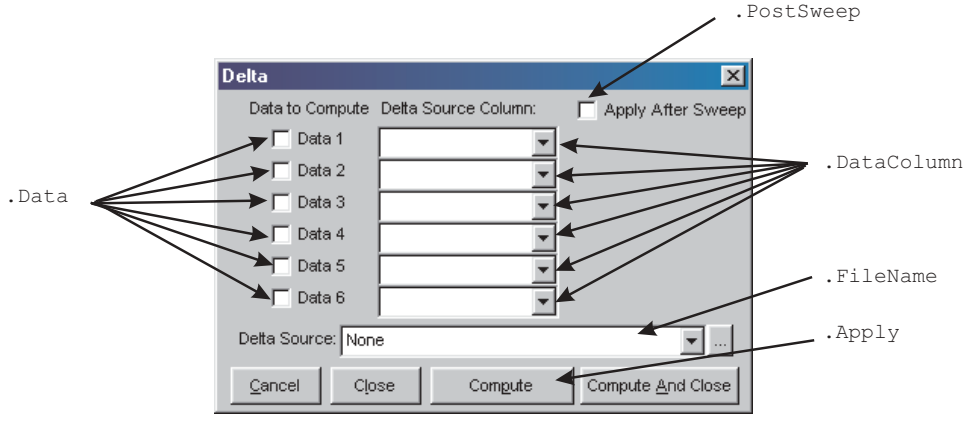


All commands for the bottom diagram start with the following:
ATS.Compute.Center
Example: ATS.Compute.Center.Apply

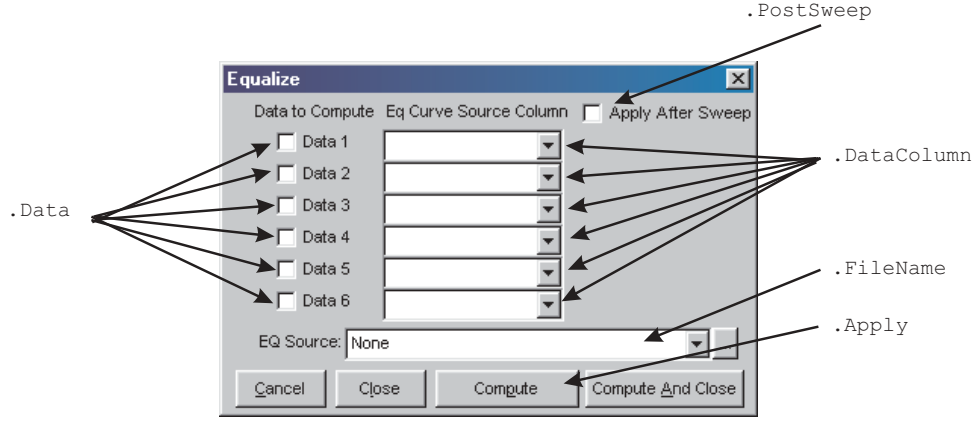


Computes Continued …

All commands for the top diagram start with the following:
ATS.Compute.Delta
Example: ATS.Compute.Delta.Apply

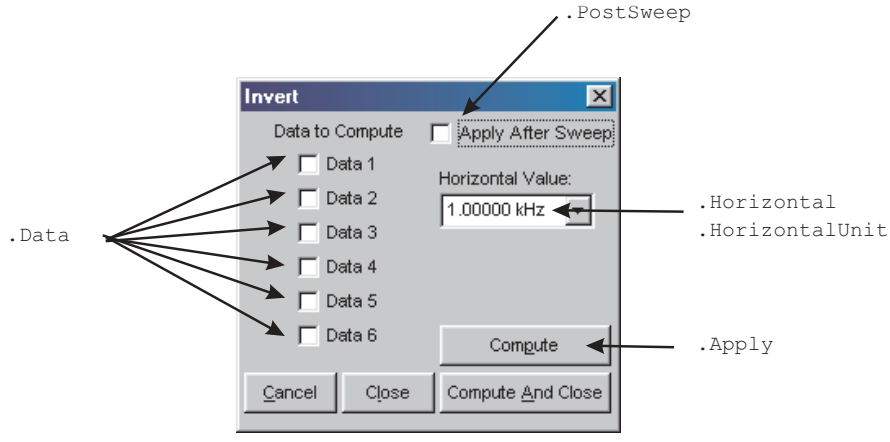


All commands for the bottom diagram start with the following:
ATS.Compute.Equalize
Example: ATS.Compute.Equalize.Apply

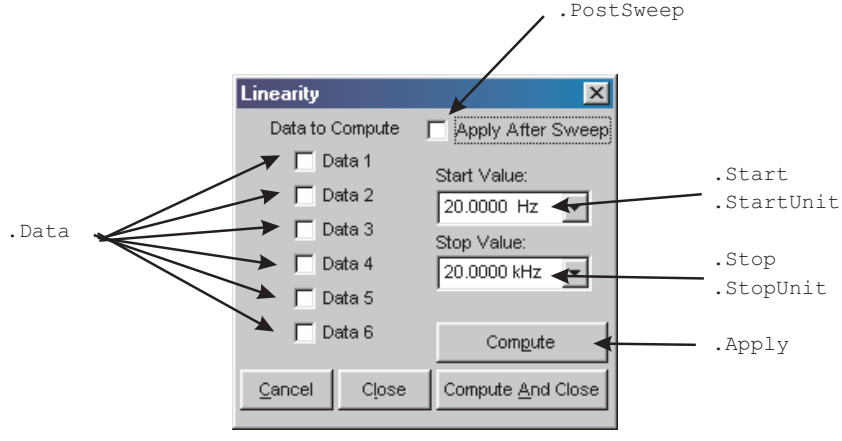


Computes Continued ...

All commands for the top diagram start with the following:
ATS.Compute.Invert
Example: ATS.Compute.Invert.Apply

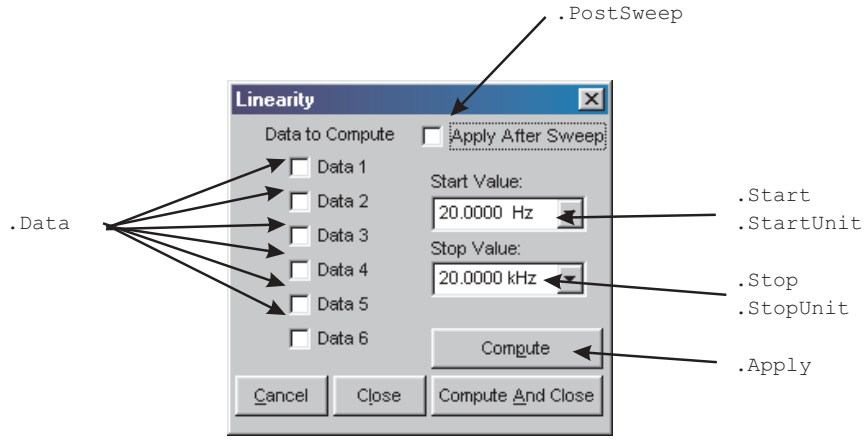


All commands for the bottom diagram start with the following:
ATS.Compute.Linearity
Example: ATS.Compute.Linearity.Apply

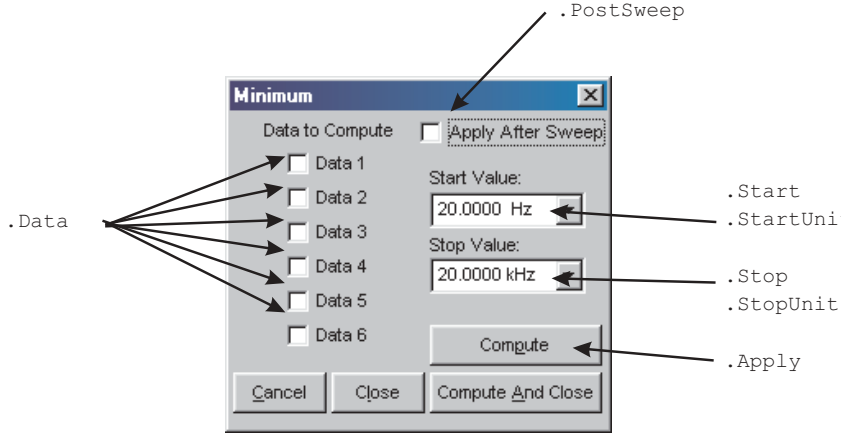


Computes Continued ...

All commands for the top diagram start with the following:
ATS.Compute.Max
Example: ATS.Compute.Max.Apply

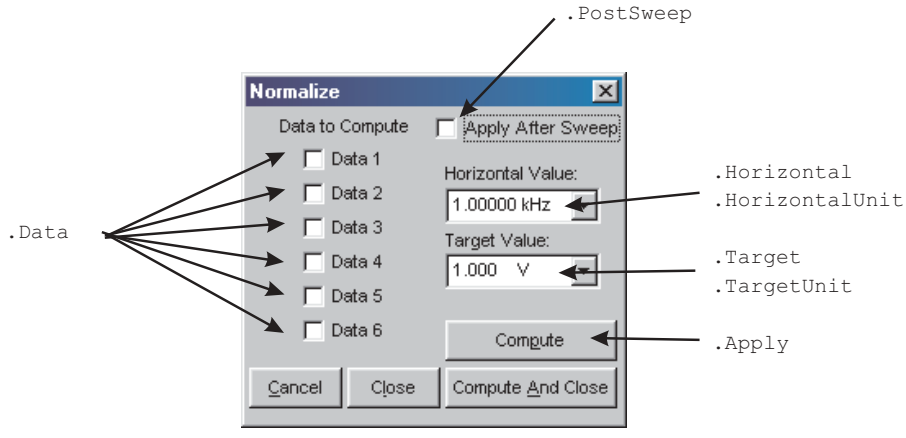


All commands for the bottom diagram start with the following:
ATS.Compute.Min
Example: ATS.Compute.Min.Apply

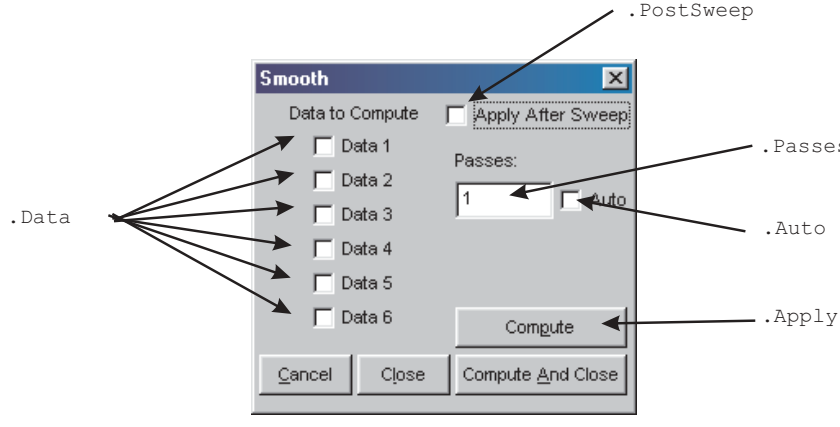


Computes Continued ...

All commands for the top diagram start with the following:
ATS.Compute.Normalize
Example: ATS.Compute.Normalixe.Apply



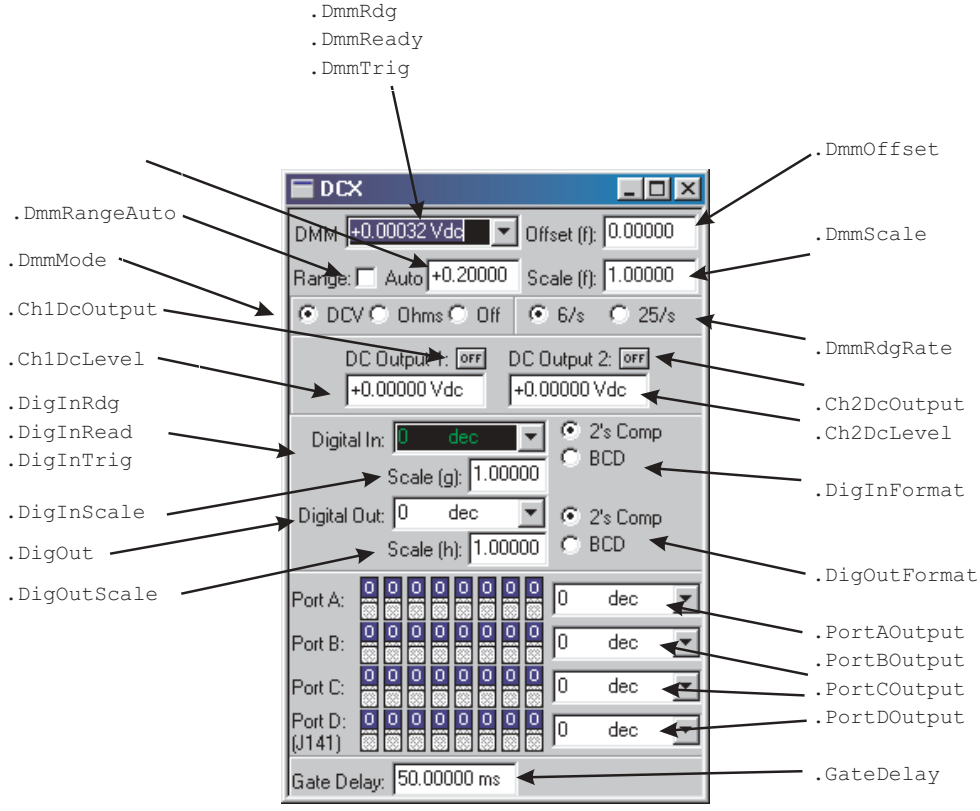
All commands for the bottom diagram start with the following:
ATS.Compute.Smooth
Example: ATS.Compute.Smooth.Apply



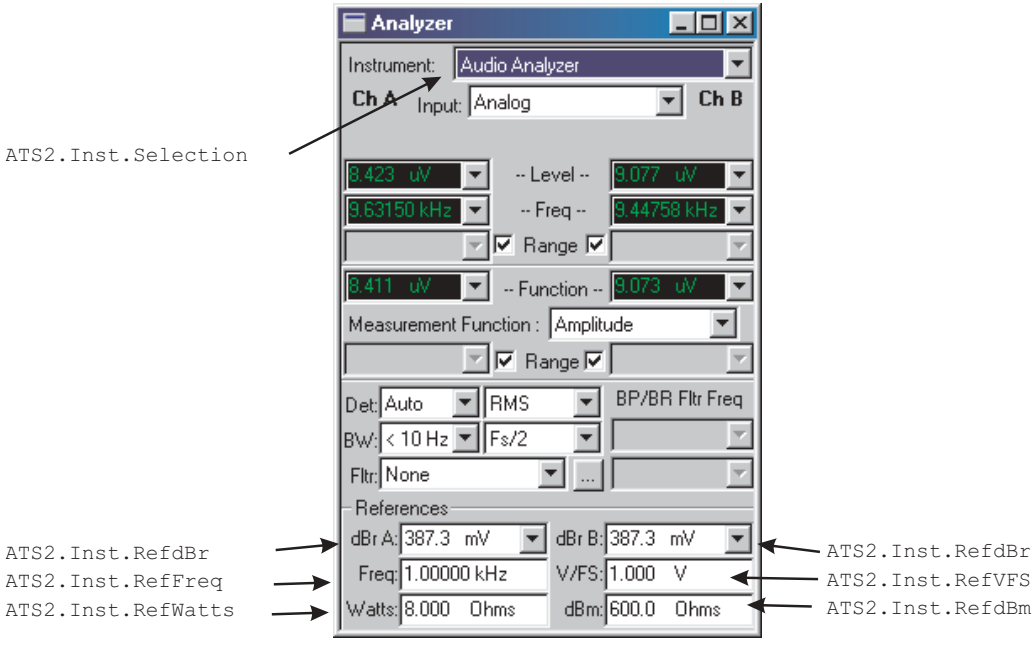
DCX-127

All commands on this page start with the following:
ATS2.DCX
Example: ATS2.DCX.DigOut

.DmmRange

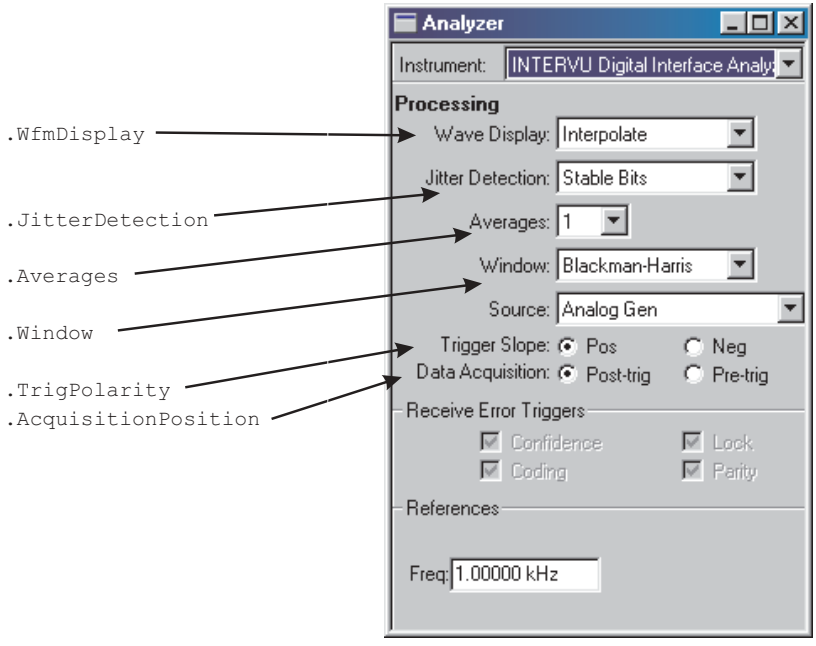


Digital Analyzer Panels



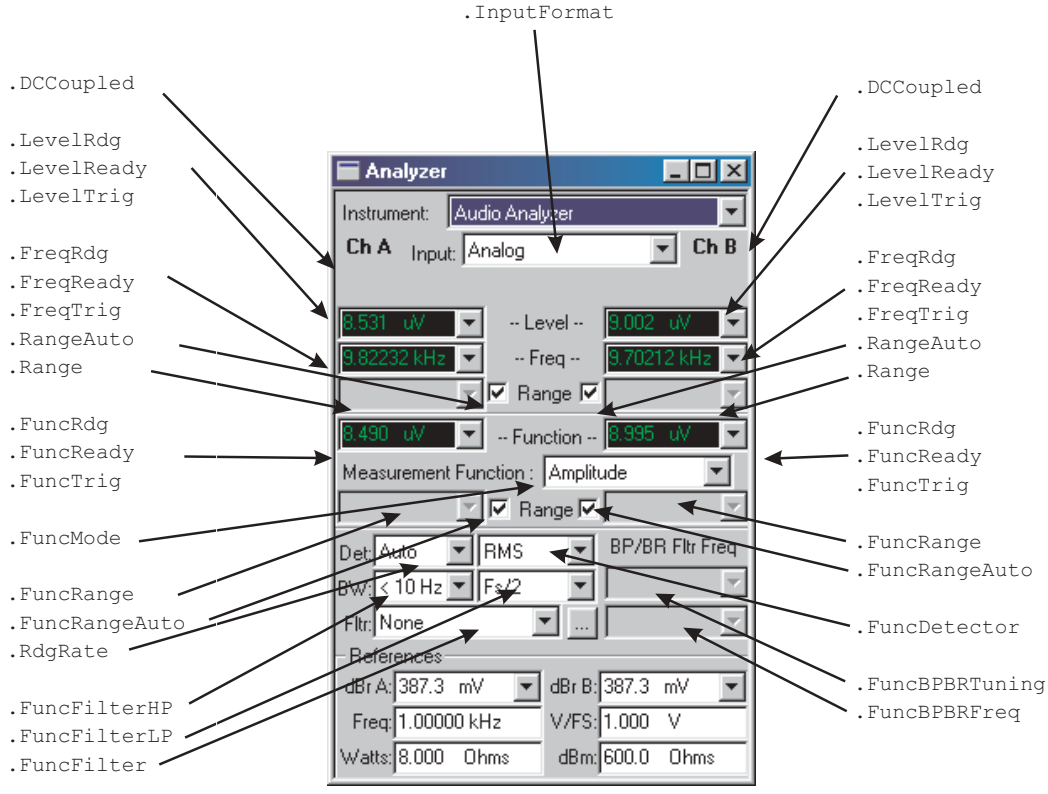
Digital Interface Analyzer (INTERVU)

All commands on this page start with the following:
ATS2.Inst.Intervu
Example: ATS2.Inst.Intervu.WfmDisplay



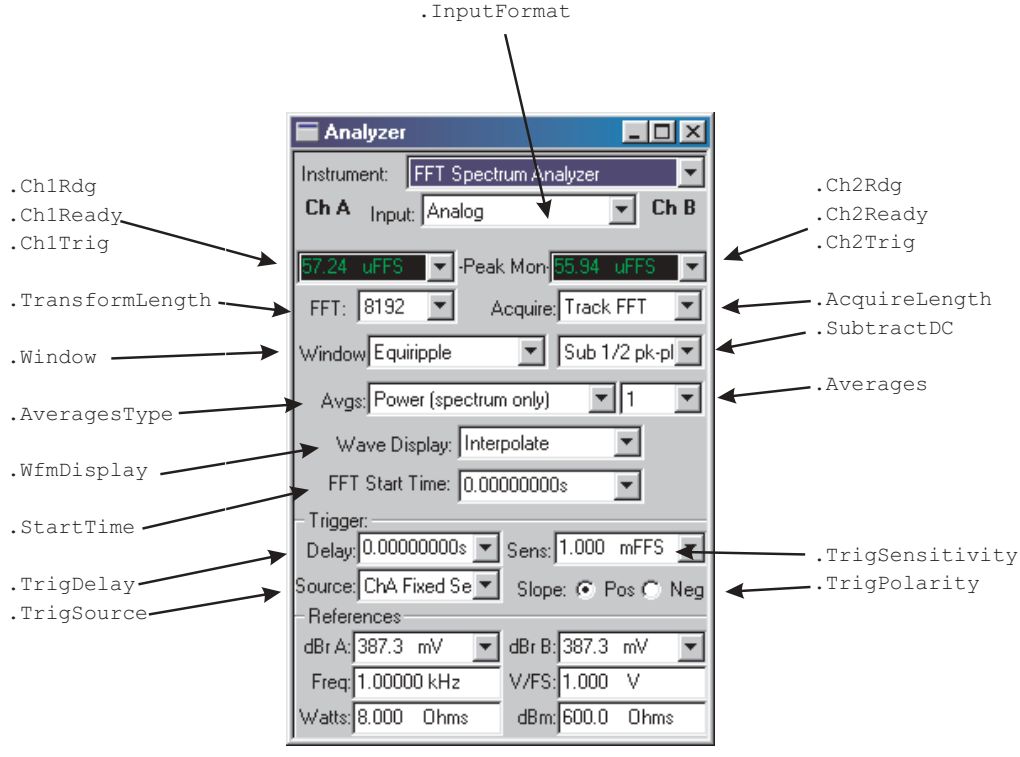
Audio Analyzer (ANALYZER)

All commands on this page start with the following:
ATS2.Inst.Analyzer
Example: ATS2.Inst.Analyzer.LevelRdg



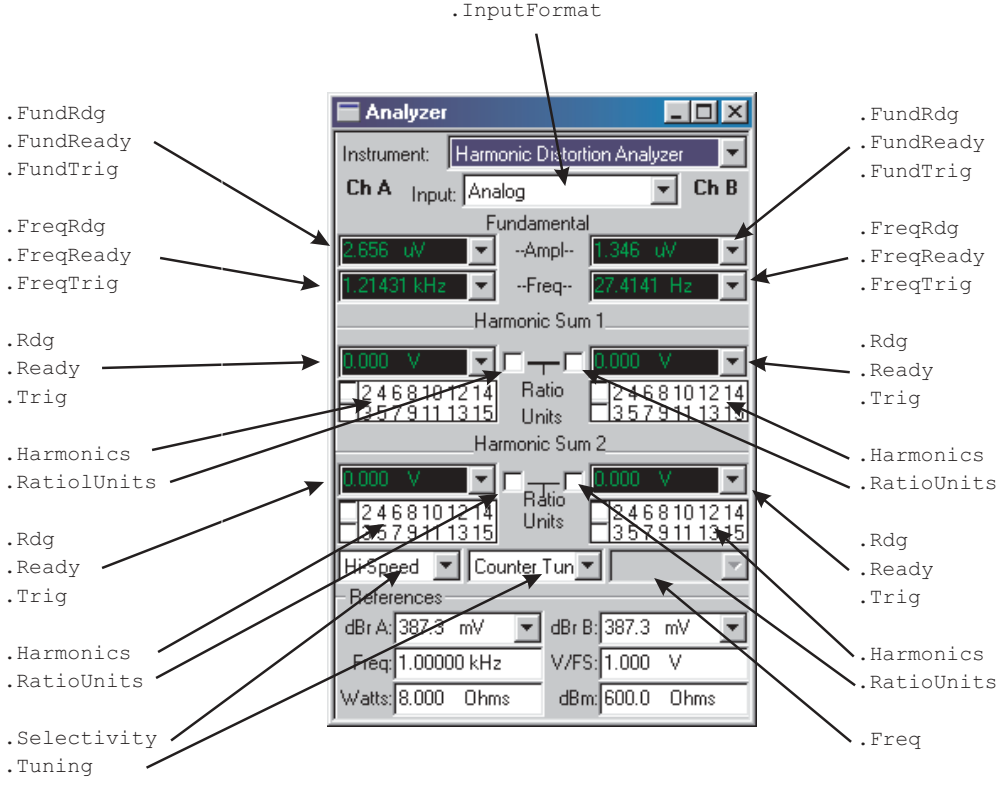
FFT Spectrum Analyzer (FFT)

All commands on this page start with the following:
AST2.Inst.FFT
Example: ATS2.Inst.FFT.InputFormat



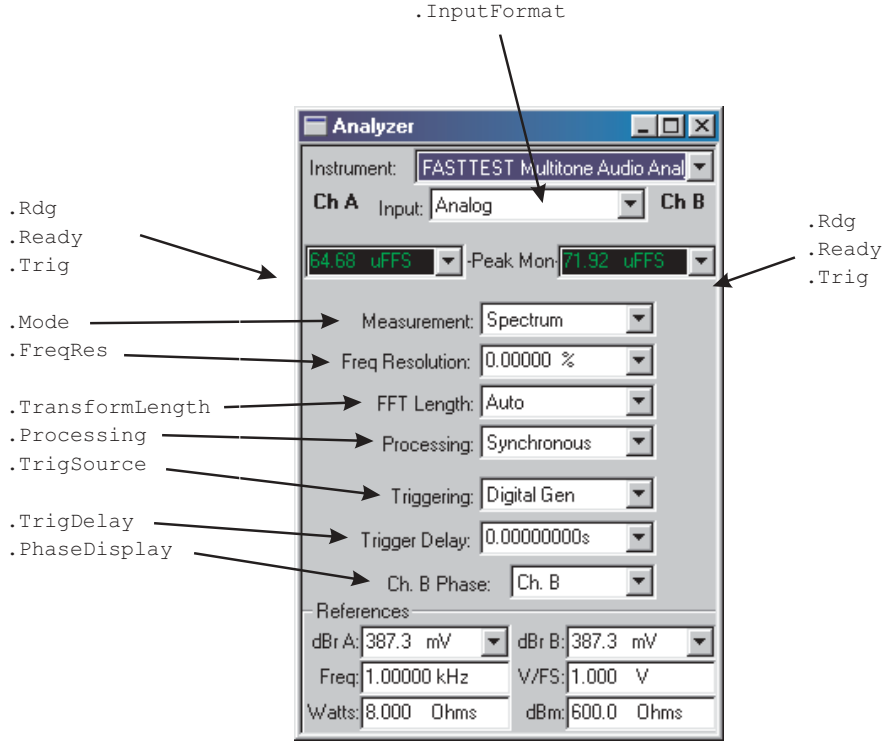
Harmonic Distortion Analyzer (DISTORT)

All commands on this page start with the following:
ATS2.Inst.Harmonic
Example: ATS2.Inst.Harmonic.InputFormat



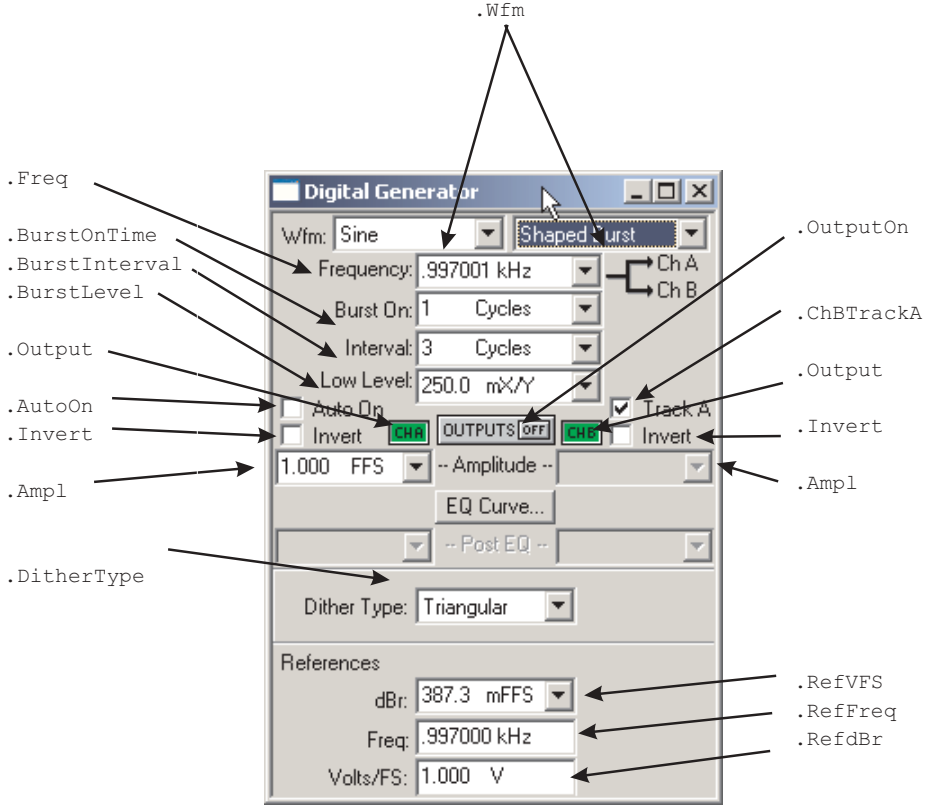
Multitone Audio Analyzer (FASTTEST)

All commands on this page start with the following:
ATS2.Inst.FastTest
Example: ATS2.Inst.FastTest.InputFormat



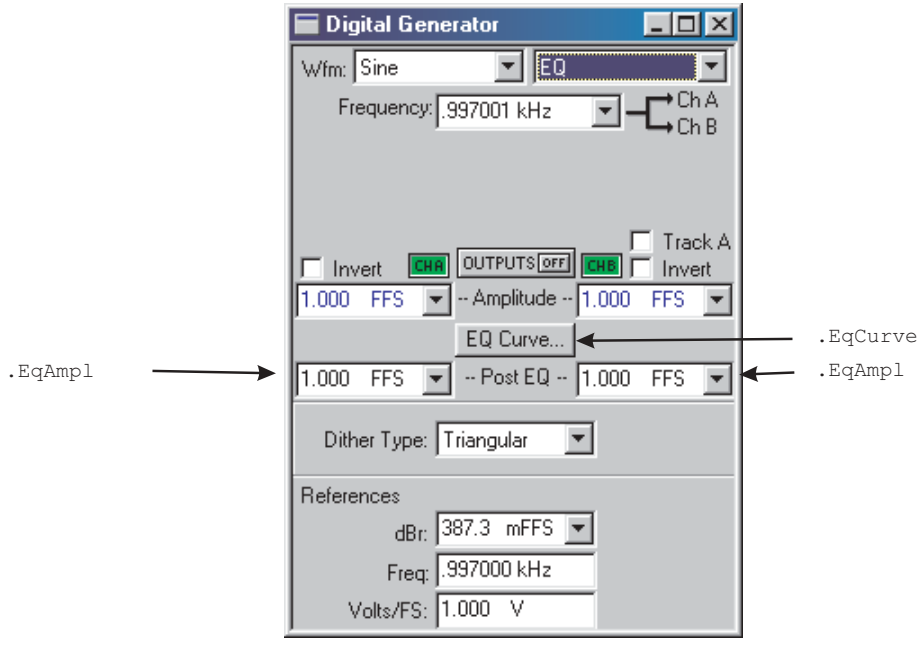
Digital Generator ...

All commands on this page start with the following:
ATS2.DGen
Example: ATS2.DGen.Freq



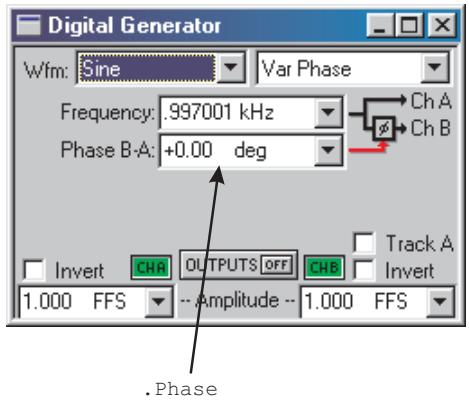
Digital Generator Continued ...

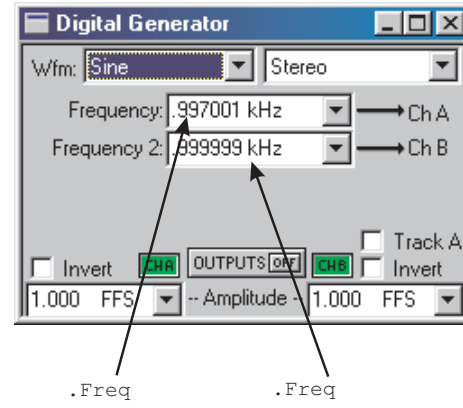
All commands on this page start with the following:
ATS2.DGen
Example: ATS2.DGen.EqAmpl

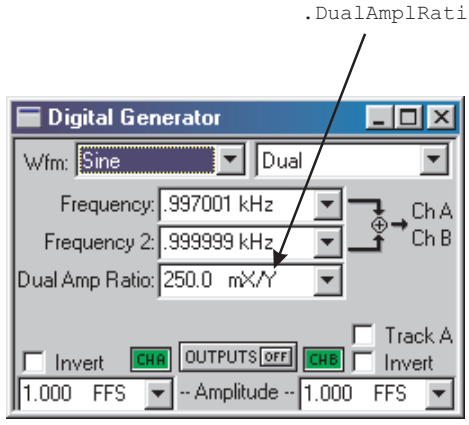


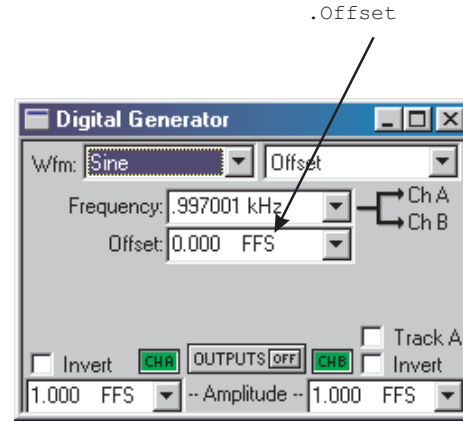
Digital Generator Continued ...

All commands on this page start with the following:
ATS2.DGen
Example: ATS2.DGen.Phase



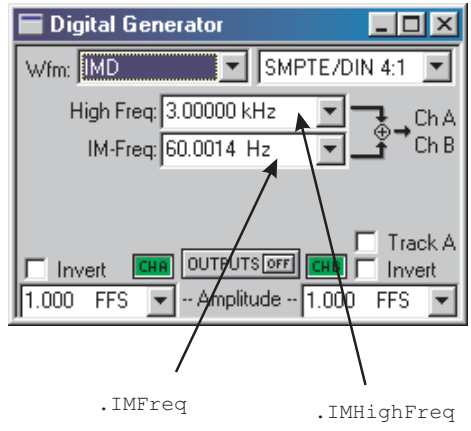


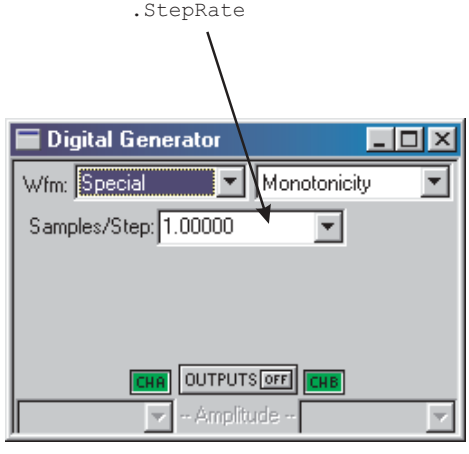


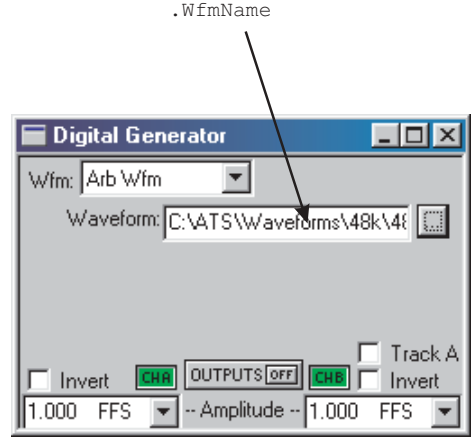


Digital Generator Continued

All commands on this page start with the following:
ATS2.DGen
Example: ATS2.DGen.IMFreq

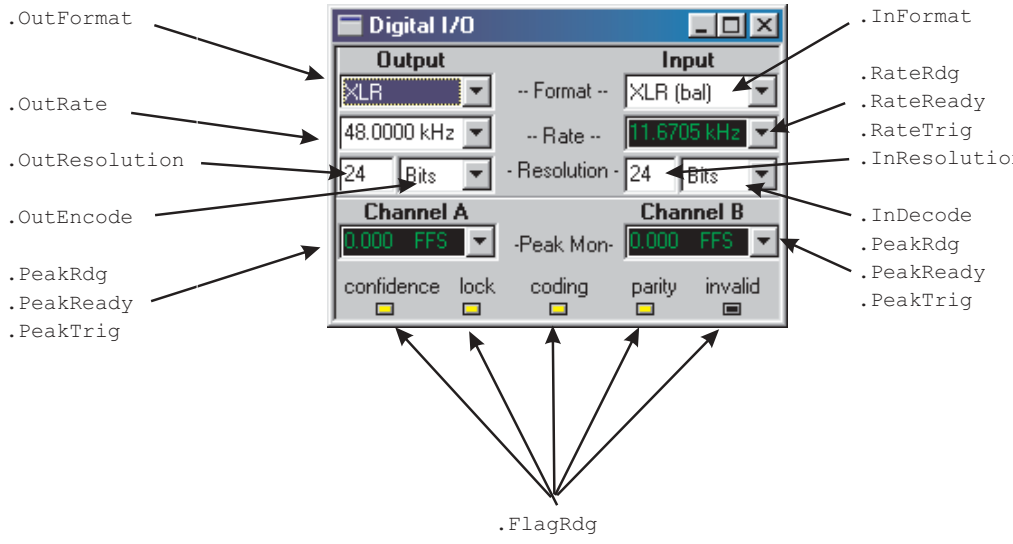






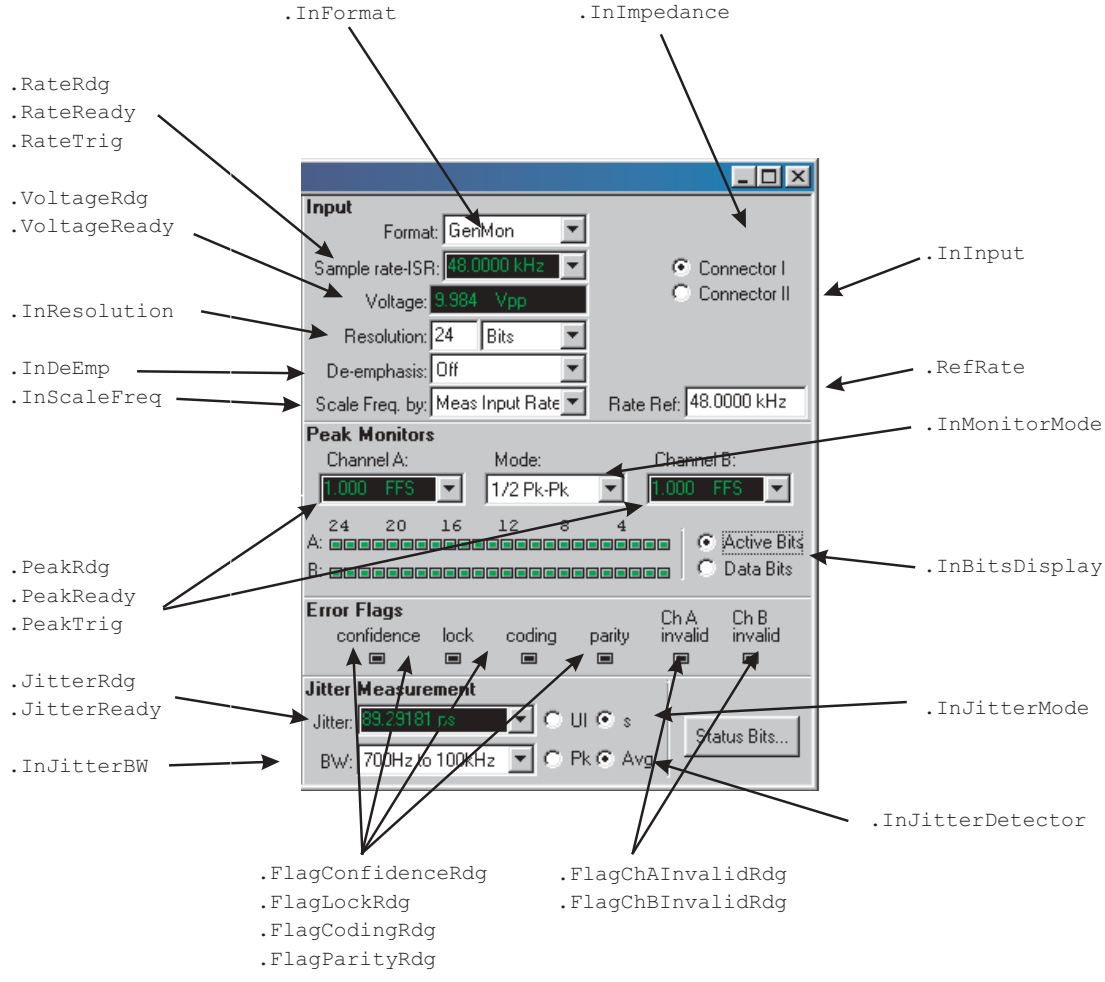
Digital IO Parameters - Input/Output small panel view...

All commands on this page start with the following:
ATS2.Dio
Example: ATS2.Dio.OutFormat



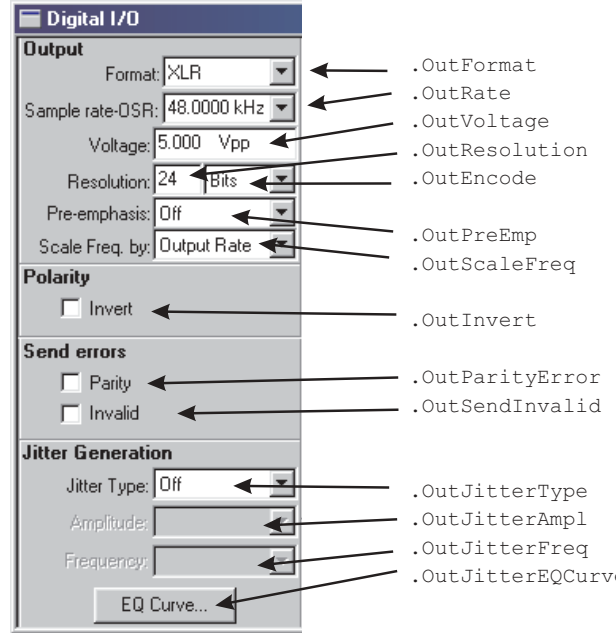
Digital IO Parameters - Input ...

All commands on this page start with the following:
ATS2.Dio
Example: ATS2.Dio.InFormat



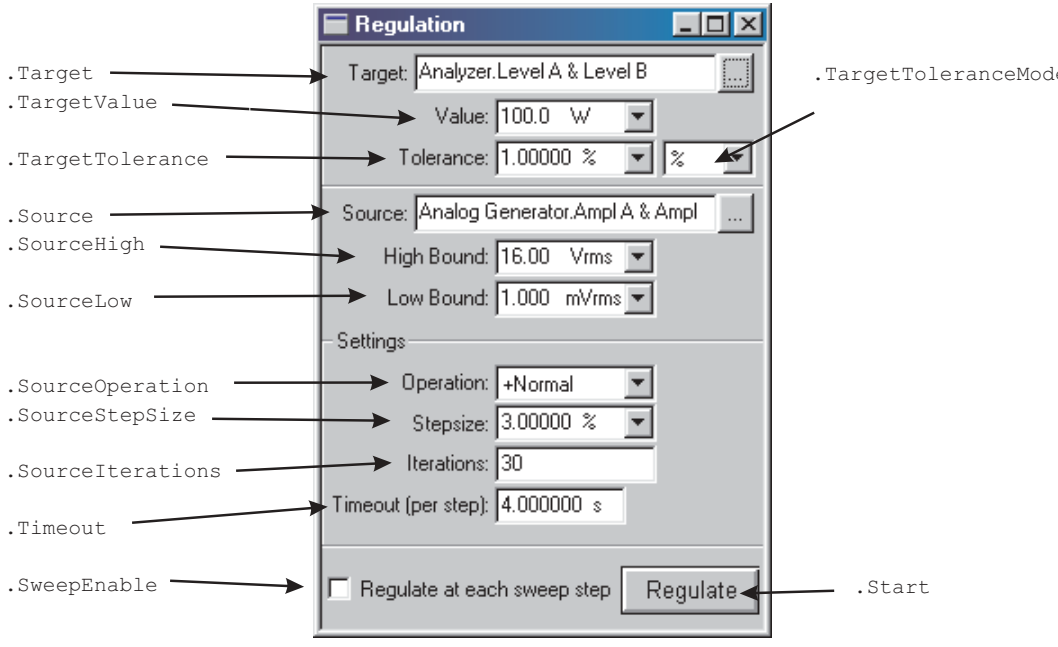
Digital IO Parameters - Output Continued

All commands on this page start with the following:
ATS2.Dio
Example: ATS2.Dio.OutFormat

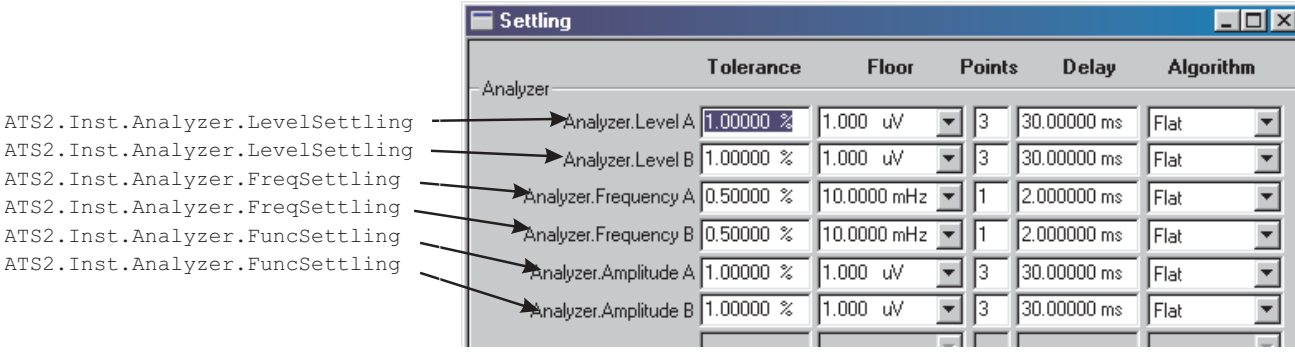


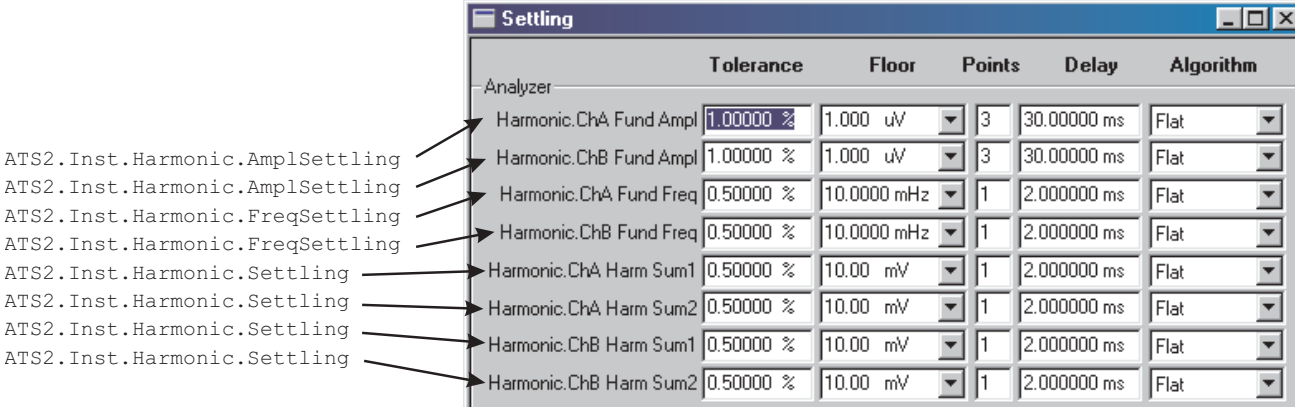
Regulation

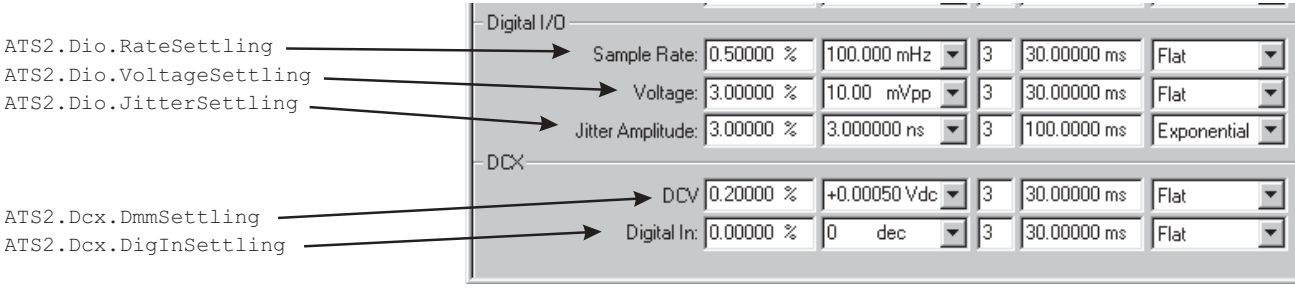
All commands on this page start with the following:
AST2.Reg
Example: ATS2.Reg.Target



Settling

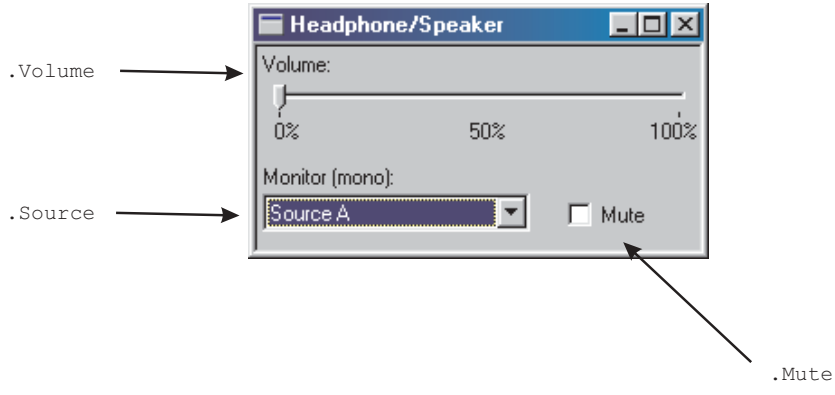

ATS2.Inst.Analyzer.LevelSettling
ATS2.Inst.Analyzer.LevelSettling
ATS2.Inst.Analyzer.FreqSettling
ATS2.Inst.Analyzer.FreqSettling
ATS2.Inst.Analyzer.FuncSettling
ATS2.Inst.Analyzer.FuncSettling
Settling
Tolerance
Floor
Points
Delay
Algorithm
Analyzer
Analyzer.Level A
Analyzer.Level B
Analyzer.Frequency A
Analyzer.Frequency B
Analyzer.Amplitude A
Analyzer.Amplitude B
1.00000 %
1.000 uV
3
30.00000 ms
Flat
0.50000 %
10.0000 mHz
1
2.000000 ms


ATS2.Inst.Harmonic.AmplSettling
ATS2.Inst.Harmonic.AmplSettling
ATS2.Inst.Harmonic.FreqSettling
ATS2.Inst.Harmonic.FreqSettling
ATS2.Inst.Harmonic.Settling
ATS2.Inst.Harmonic.Settling
ATS2.Inst.Harmonic.Settling
ATS2.Inst.Harmonic.Settling
Settling
Tolerance
Floor
Points
Delay
Algorithm
Analyzer
Harmonic.ChA Fund Ampl
Harmonic.ChB Fund Ampl
Harmonic.ChA Fund Freq
Harmonic.ChB Fund Freq
Harmonic.ChA Harm Sum1
Harmonic.ChA Harm Sum2
Harmonic.ChB Harm Sum1
Harmonic.ChB Harm Sum2
1.00000 %
1.000 uV
10.0000 mHz
0.50000 %
10.00 mV
3
1
30.00000 ms
2.000000 ms
Flat


ATS2.Dio.RateSettling
ATS2.Dio.VoltageSettling
ATS2.Dio.JitterSettling
ATS2.Dcx.DmmSettling
ATS2.Dcx.DigInSettling
Digital I/O
Sample Rate:
Voltage:
Jitter Amplitude:
DCX
DCV
Digital In:
0.50000 %
100.000 mHz
3.00000 %
10.00 mVpp
3.000000 ns
100.0000 ms
Exponential
0.20000 %
+0.00050 Vdc
0.00000 %
0 dec
3
30.00000 ms
Flat

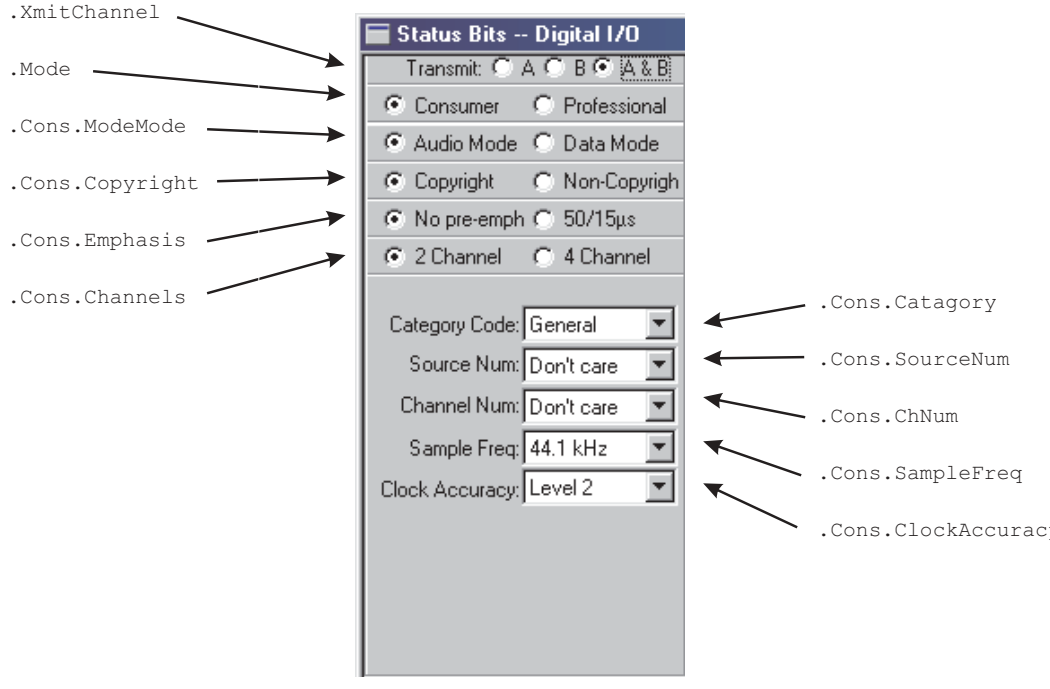
Speaker

All commands on this page start with the following:
ATS2.Speaker
Example: ATS2.Speaker.Source



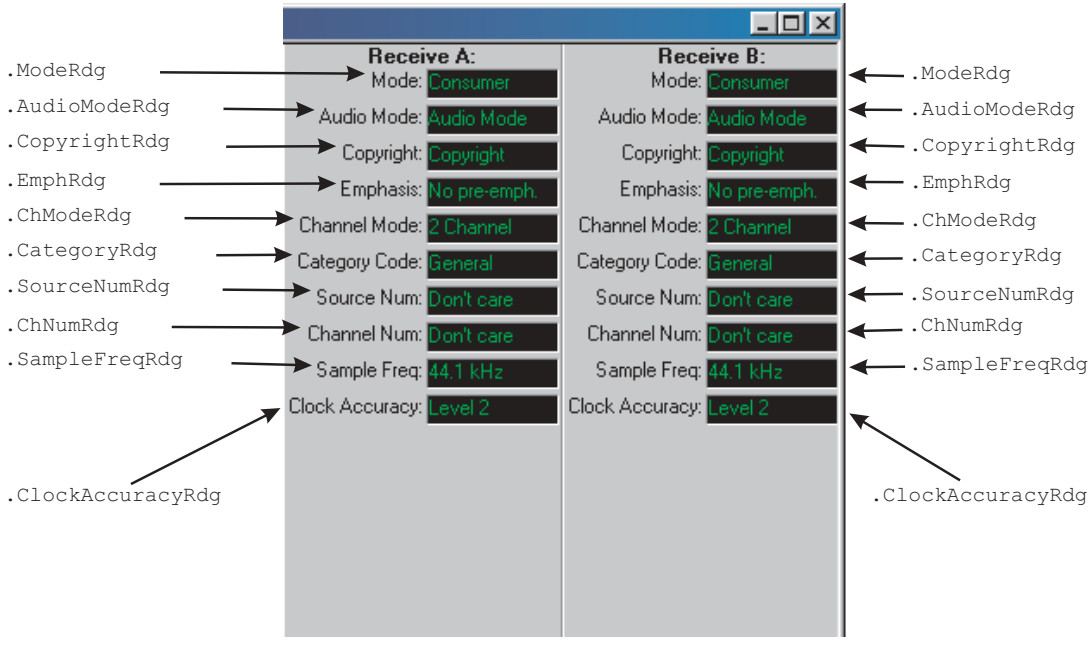
Status Bits — Digital IO - Transmit Consumer

All commands on this page start with the following:
ATS2.Bits
Example: ATS2.Bits.Mode



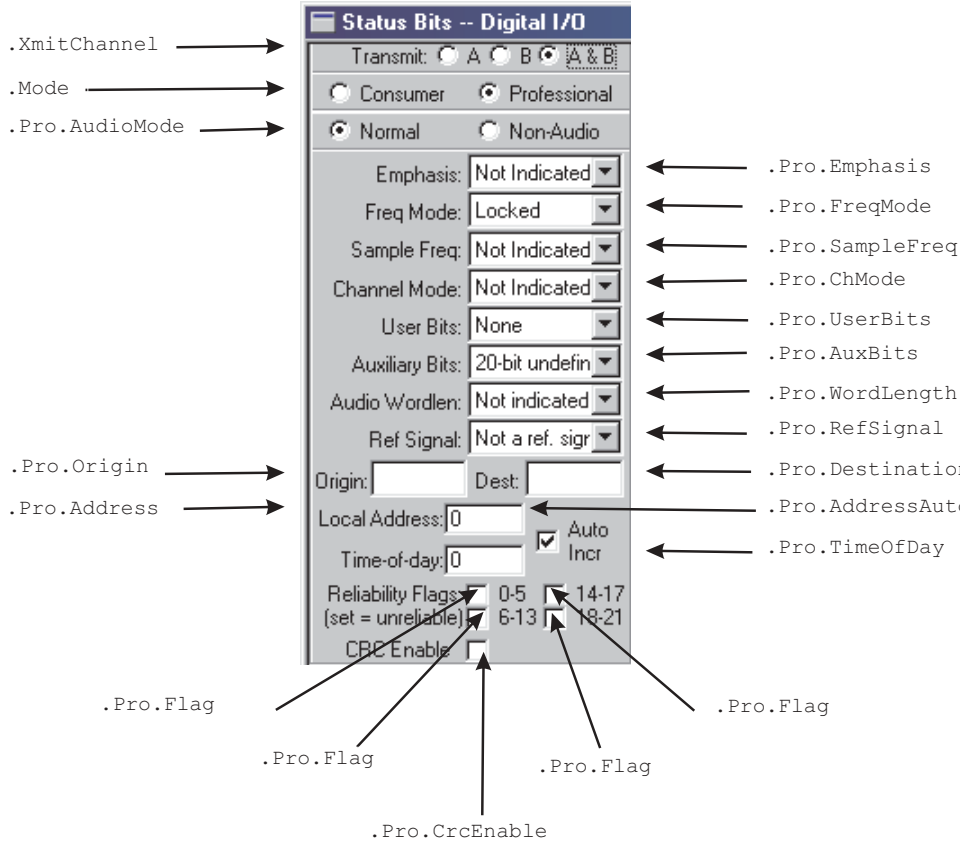
Status Bits — Digital IO - Receive Consumer

All commands on this page start with the following:
ATS2.Bits
Example: ATS2.Bits.



Status Bits — Digital IO - Transmit Professional

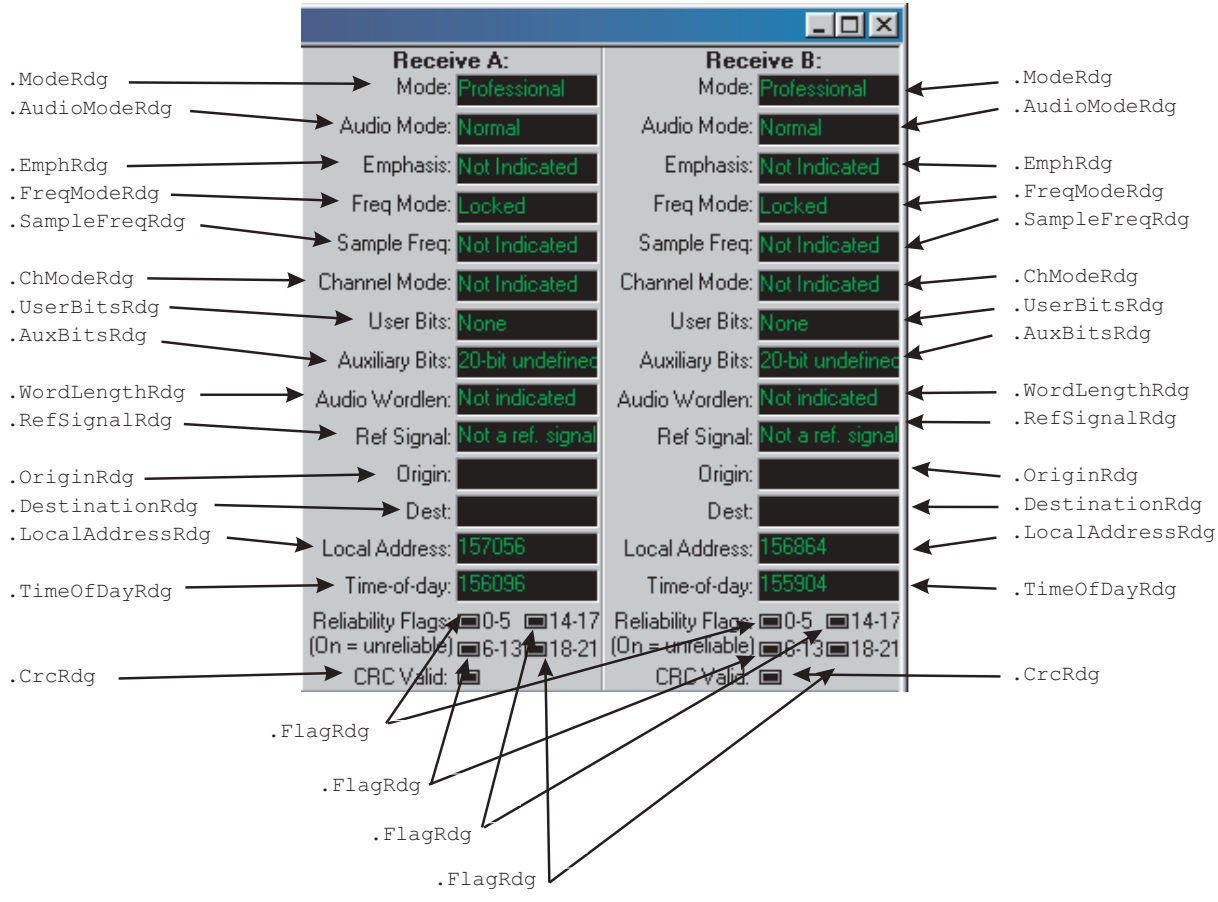
All commands on this page start with the following:
ATS2.Bits
Example: ATS2.Bits.XmitChannel



Status Bits — Digital IO - Receive Professional

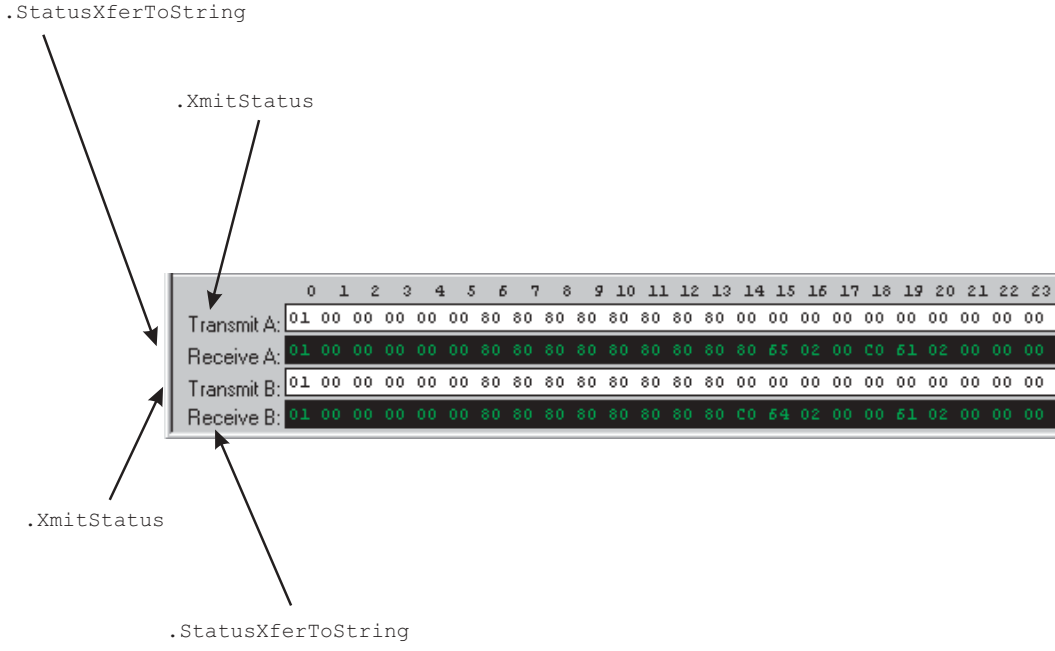
.ModeRdg

All commands on this page start with the following:
ATS2.Bits
Example: ATS2.Bits.



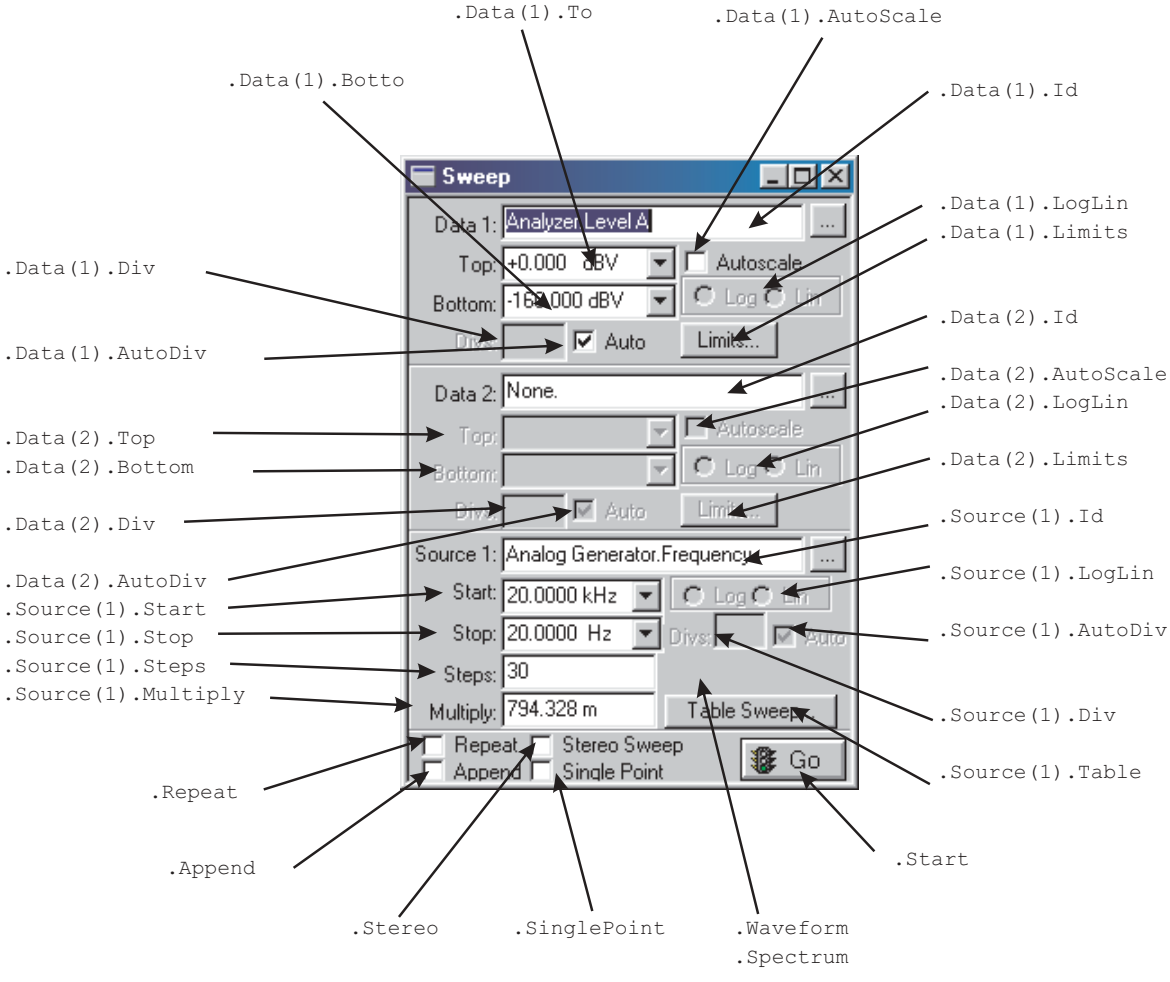
Status Bits — Digital IO - Receive Professional

All commands on this page start with the following:
ATS2.Bits
Example: ATS2.Bits.StatusXferToArray



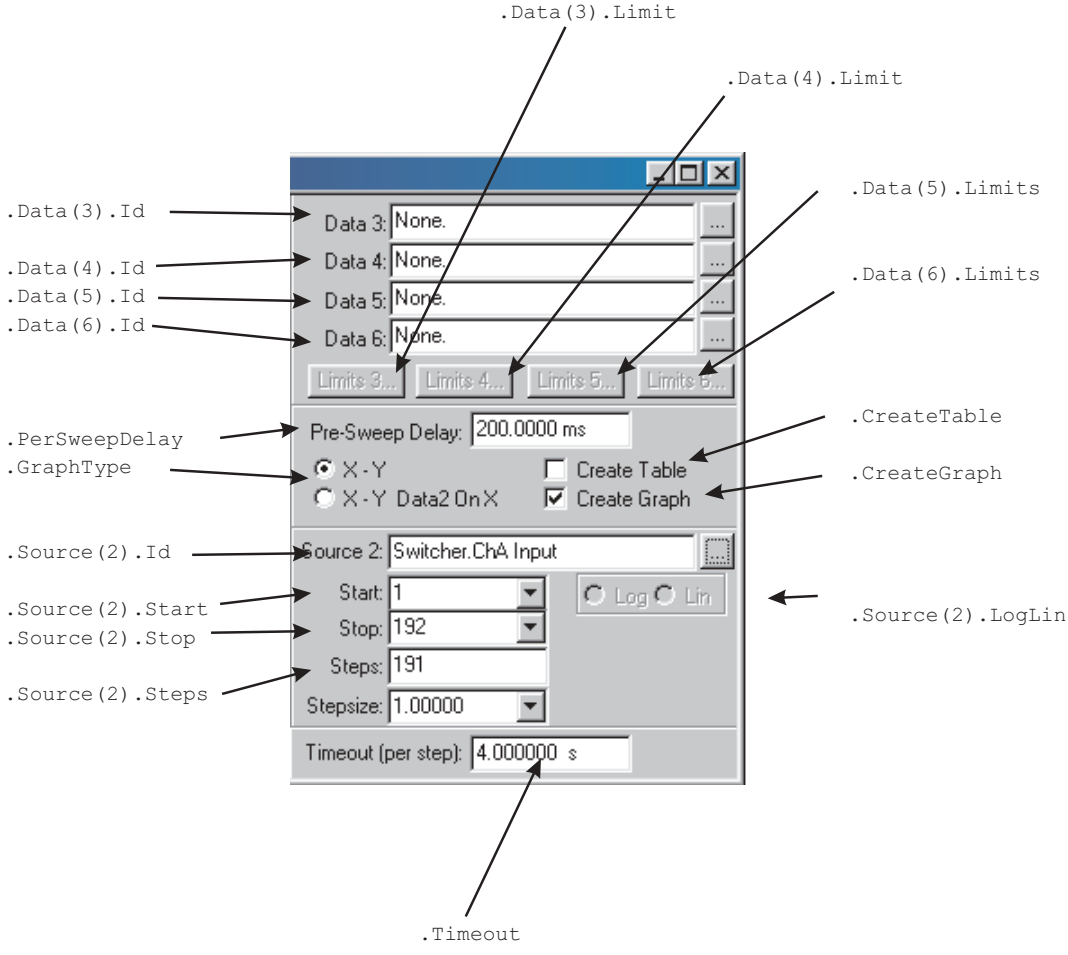
Sweep ...

All commands on this page start with the following:
ATS.Sweep
Example: ATS.Sweep.Data(1).Id



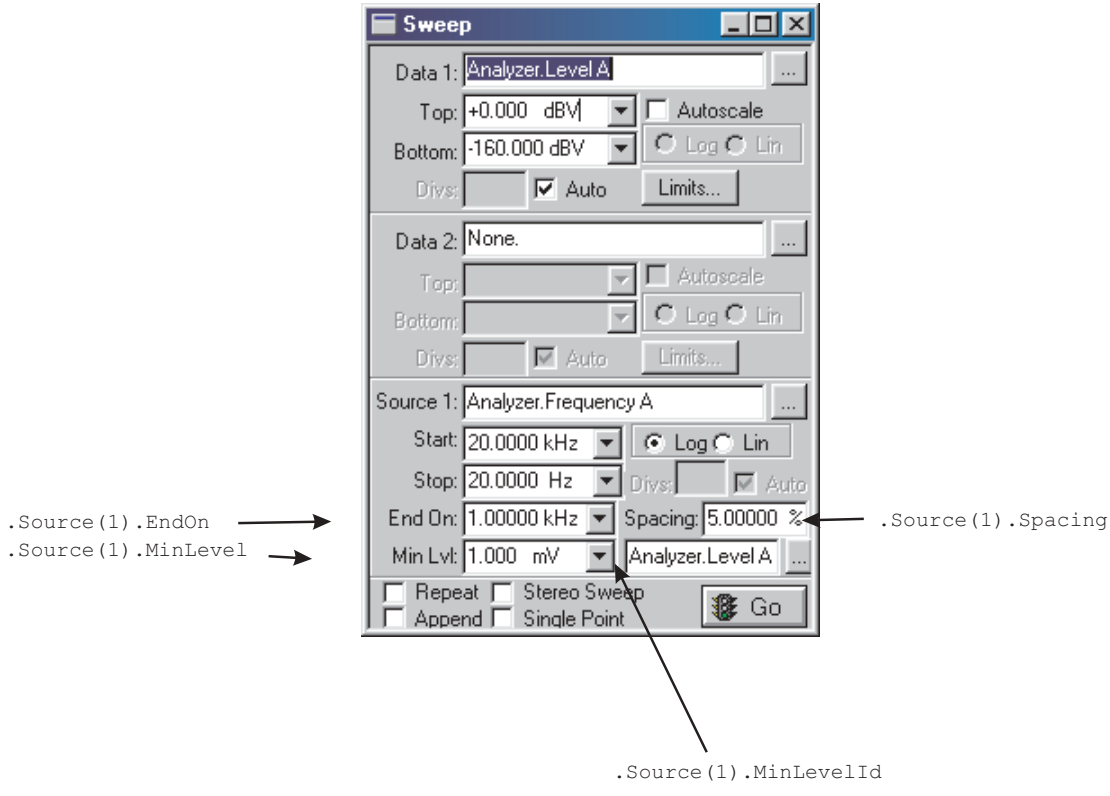
Sweep Continued …

All commands on this page start with the following:
ATS.Sweep
Example: ATS.Sweep.Data(1).Id



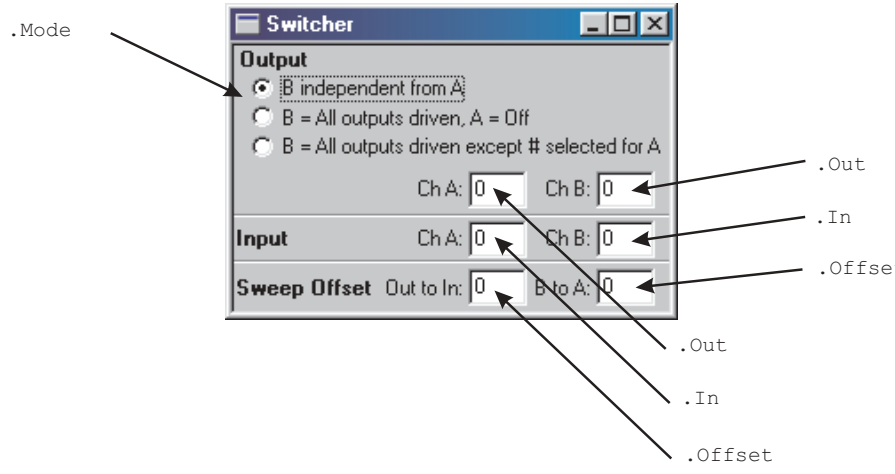
Sweep Continued ...

All commands on this page start with the following:
ATS.Sweep
Example: ATS.Sweep.Source(1).EndOn



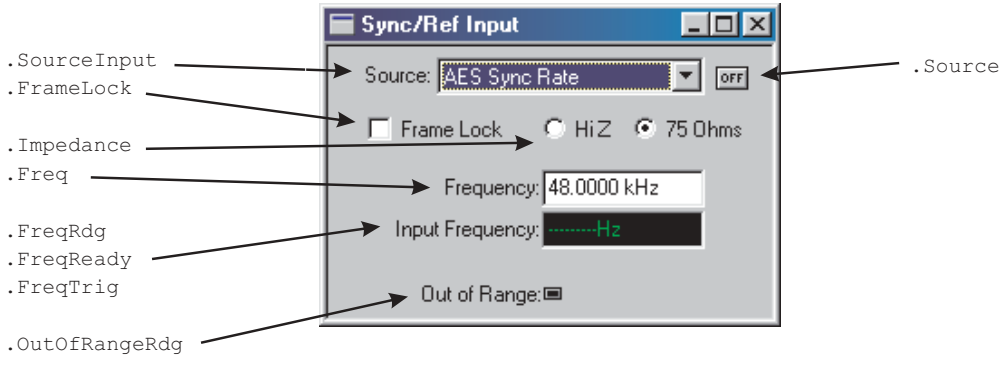
Switcher

All commands on this page start with the following:
ATS2.Swr
Example: ATS2.Swr.Mode



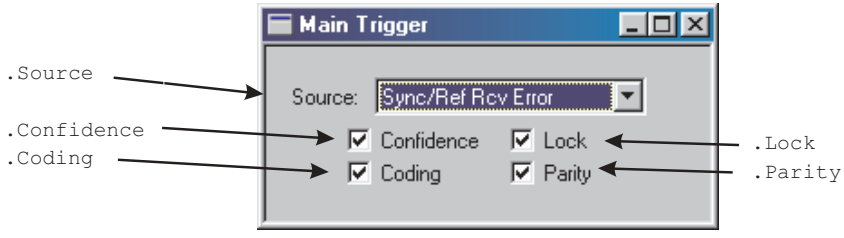
Sync

All commands on this page start with the following:
ATS2.Sync
Example: ATS2.Sync.Source



Main Triggers

All commands on this page start with the following:
ATS2.Sync
Example: ATS2.Triggers.Coding



Chapter 3
Application

ATS.Application.AppDir — Method

Syntax `ATS.Application.AppDir`

Result String

Description This command returns the application directory. When installing the software the default application directory is `"C:\Program Files\Audio Precision\ATS n.nn\"`.

Example

```
Declare Function GetShortPathName Lib "kernel32" _
  Alias "GetShortPathNameA" _
  (ByVal lpLongPath As String, _
  ByVal lpShortPath As String, _
  ByVal nSizeShortPath As Long) As Long

Sub main()
  Dim LongPath As String
  Dim ShortPath As String
  ShortPath = String(255, vbNullChar)

  LongPath = ATS.Application.AppDir
  ReturnLength = GetShortPathName(LongPath, _
     ShortPath, Len(ShortPath))
  ShortPath = Left(ShortPath, ReturnLength)
  Debug.Print "Long Path = " & LongPath
  Debug.Print "Short Path = " & ShortPath
End Sub
```

Output

```
Long Path = C:\PROGRAM FILES\AUDIO PRECISION\ATS n.nn\
Short Path = C:\PROGRA~1\AUDIOP~1\ATS~1\
```

ATS.Application.ClearCurrentError Method

Syntax **ATS.Application.ClearCurrentError**

Description This command when executed clears the current error.

Note: In AP Basic, "Dim WithEvents" is allowed in any module. In Visual Basic, "Dim WithEvents" is only allowed in Class modules.

See Appendix D Extensions Error Codes for Error String numbers and descriptions.

Example

```
Sub Main
  ATS2.AGen.Ampl(apbChA, "Vrms") = 111.9
  'Cause an error and see what happens.
End Sub

Public Sub ATSEvent_OnError(ByVal ErrorCode As Long)
  Debug.Print "Got number " & ErrorCode & " " & _
     ATS.Application.GetCurrentErrorString

  ' If you are going to handle the error, then call
  ' ATS.Application.ClearCurrentError before you exit
  ' this subroutine to stop ATS from displaying the
  ' error,

  ATS.Application.ClearCurrentError

  ' It is also preferable to call
  ' ATS.Application.ClearCurrentError before you
  ' make any other calls into ATS in case these
  ' calls also generate an unexpected error
End Sub
```

ATS.Application.CloseAll Method

Syntax **ATS.Application.CloseAll(**ByVal *PageNum* As Integer)

Parameter	Name	Description
	PageNum	1 - 5 = Remove all panels from view specified page.

Description This command removes all panels from view on the selected page.

Example

```
Sub Main
  ATS.Application.NewTest
  ATS.Application.PanelOpen(apbAnalogGen, apbLarge)
  ATS.Application.PanelOpen(apbSweep, apbSmall)
  ATS2.AGen.OutputOn = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS2.Inst.Analyzer.FuncFilterHP = apbAnlrHP400
  ATS.Application.Page = 3
  ATS.Application.CloseAll(2)
  ATS.Application.Page = 2
  ATS.Sweep.Start
End Sub
```

ATS.Application.CloseAllPages Method

Syntax **ATS.Application.CloseAllPages**

Description This command removes all panels from view on all pages.

Example

```
Sub Main
  ATS.Application.NewTest
  ATS.Application.PanelOpen(apbAnalogGen, apbLarge)
  ATS.Application.PanelOpen(apbSweep, apbSmall)
  ATS2.AGen.OutputOn = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS2.Inst.Analyzer.FuncFilterHP = apbAnlrHP400
  ATS.Application.Page = 3
  ATS.Application.CloseAllPages
  ATS.Application.Page = 2
  ATS.Sweep.Start
End Sub
```

ATS.Application.CopyPanelToClipboard Method

Syntax **ATS.Application.CopyPanelToClipboard**

Description This command copies the graphic image of the panel that has focus to the Clipboard.

Example

```
Sub Main
  ATS.Application.NewTest
  ATS2.AGen.OutputOn = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS2.Inst.Analyzer.FuncFilterHP = apbAnlrHP400
  ATS2.Inst.Analyzer.FuncFilterLP = apbAnlrLP20k
  ATS.Sweep.Data(1).Id = 6343
  ATS.Sweep.Source(1).Start("Hz") = 30000.0
  ATS.Sweep.Start
  ATS.Graph.OptimizeLeft
  ATS.Application.CopyPanelToClipboard

  Dim MSWord As Object
  Set MSWord = CreateObject("Word.Basic") 'Start Word
  With MSWord
     .AppShow             'Display MS Word
     .FileOpen Name:= CurDir & "\GENERIC.DOC"
     .EditFind "Place Graph Here" 'Search for string

     .EditPaste           'Paste Graph into Word
     Wait 10
     .FileCloseAll 2      'Close all open files
     .AppClose            'Close MS Word
  End With
End Sub
```

ATS.Application.DisplayCurrentError Method

Syntax **ATS.Application.DisplayCurrentError**

Result None

Description This command temporally overrides display suppression of error messages by the error handler and displays for the current error.

Example

```
Sub Main
  ATS.Gen.Ampl(apbChA, "Vrms") = 111.9
  'Cause an error and see what happens.
End Sub
Public Sub ATSEvent_OnError(ByVal ErrorCode As Long)
  Debug.Print "Got number " & ErrorCode & " " & _
     ATS.Application.GetCurrentErrorString

' In some cases you may want the operator to see the
' error message.  The following command will display
' the error.

  ATS.Application.DisplayCurrentError

' If you are going to handle the error, then call
' ATS.Application.ClearCurrentError before you exit
' this subroutine to stop ATS from displaying the
' error.

  ATS.Application.ClearCurrentError

' It is also preferable to call
' ATS.Application.ClearCurrentError before you make
' any other calls into ATS in case these calls also
' generate an unexpected error.
End Sub
```

ATS.Application.DisplayDataOnTestOpen Property

Syntax **ATS.Application.DisplayDataOnTestOpen**

Data Type Boolean

True	Display data on test open.
False	Don't display data on test open.

Description This command specifies whether the measurement data saved in a test file is displayed when the file is loaded.

Example

```
Sub Main
  ATS.Application.DisplayDataOnTestOpen = False
  ATS.File.OpenTest "SAMPLE1.ATS2"
  String1$ = "Test Loaded and data NOT displayed."
  ATS.Prompt.Text = String1$
  ATS.Prompt.FontSize = 10
  ATS.Prompt.Position -1,-1,290,120
  ATS.Prompt.ShowWithContinue
  Stop

  ATS.Application.DisplayDataOnTestOpen = True
  ATS.File.OpenTest "SAMPLE1.ATS2"
  String1$ = "Test loaded and data displayed."
  ATS.Prompt.Text = String1$
  ATS.Prompt.FontSize = 10
  ATS.Prompt.Position -1,-1,290,100
  ATS.Prompt.ShowWithContinue
  Stop
End Sub
```

ATS.Application.DoReadings — Method

Syntax **ATS.Application.DoReadings**

Result None

Description This command forces a reading cycle to take place. The reading cycle allows the reading commands (commands ending in Rdg such as `ATS2.Inst.Analyzer.FuncRdg`) to make and return a measurement. Under normal conditions when a dialog is displayed the automatic readings cycle is disabled and readings will not return correctly. Use this command to force a reading cycle to take place while a dialog is displayed.

Example

```
Sub Main
  ATS.Application.NewTest
  ATS2.AGen.OutputOn = True
```

```
   ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
   ATS2.AGen.Ampl(apbChA, "Vrms") = 0.5

   Begin Dialog UserDialog 270,105,"Readings _
         Example",.Handler 'GRID:10,7,1,1
      PushButton 40,7,190,21,"Make _
         Reading",.PushButton1
      TextBox 40,35,190,21,.TextBox1
      CancelButton 40,63,190,21
   End Dialog
   Dim dlg As UserDialog
   Select Case Dialog (dlg)
   Case 0
      End
   End Select
End Sub

Private Function Handler(DlgItem$, Action%, _
      SuppValue&) As Boolean
   Select Case Action%
   Case 1
   Case 2
      If DlgItem$ = "PushButton1" Then
         Handler = True
         ATS2.Inst.Analyzer.FuncSettling(apbChA, 5.0,
            1.0e-007, "V", 3, 0.05, apbExponential)
         ATS2.Inst.Analyzer.FuncTrig(apbChA)
         Do
            ATS.Application.DoReadings
         Loop Until ATS.Analyzer.FuncReady(apbChA)
         AReading = ATS2.Inst.Analyzer.FuncRdg _
            (apbChA, "V")
         DlgText "TextBox1", "Amplitude = " & _
            Format(AReading, "#.00000") & " V"
      End If
   Case 3         'TextBox or ComboBox text changed
   Case 4         'Focus changed
   Case 5         'Idle
      Rem Handler = True 'Continue getting idle
actions
   Case 6         'Function key
```

```
  End Select
End Function
```

ATS.Application.GetCurrentErrorString Method

Syntax **ATS.Application.GetCurrentErrorString**

Result String

Description This command returns the ASCII text string for the current error.

See Appendix D Extensions Error Codes for Error String numbers and descriptions.

Example See example for `ATS.Application.ClearCurrentError`.

ATS.Application.GetEnumString Method

Syntax **ATS.Application.GetEnumString(**ByVal *Function* As String, ByVal *Enumeration* As Integer**)**

Result String

Parameter

Name	Description
Function	OLE command extension.
Enumeration	Enumerated Constant.

Description This command returns the ASCII text string for the specified Enumerated Constant.

Example

```
Sub Main
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInBNC_Unbal
  Debug.Print apbAnalogInBNC_Unbal
  Debug.Print ATS.Application.GetEnumString _
  ("ATS2.AnalogIn.Source", apbAnalogInBNC_Unbal)
End Sub
```

Output

```
 1847
apbAnalogInBNC_Unbal
```

ATS.Application.HomeDir Method

Syntax **ATS.Application.HomeDir**

Result String

Description This command returns the home directory. When installing the software the default home directory is "C:\Documents and Settings*username*\My Documents\Audio Precision\ATS n.nn\". The home directory is the default location for saved tests, sample files, log files and other user files.

ATS.Application.MacroDir (OLE) Method

Syntax **ATS.Application.MacroDir**

Result String

Description This command returns the running macro source directory. This command is like the MacroDir$ command in the Language reference section of AP Basic with the exception that this command can be used from an OLE client that is accessing ATS to determine the directory from which the selected macro was loaded.

Example

```
Private Sub Form_Load()
  Dim ATS As Object
  Dim ATS2 As Object
  Set ATS = CreateObject("ATS.Application")
  Set ATS2 = CreateObject("ATS.ATS-2")

'The following lines makes the Visual Basic Current
' Directory and the ATS Working Directory the same
' as the directory where the current AP Basic macro
' was loaded from.

  With ATS.Application
     .Visible = True
     ATS.File.OpenMacro ("C:\BUSY.ATSB")
     ChDir .MacroDir
     .WorkingDir = .MacroDir
```

```
  End With

  'Your code goes here.

End Sub
```

ATS.Application.Name — Method

Syntax **ATS.Application.Name**

Result String ASCII charactors.

Description This command returns the ATS Application Name "Audio Precision ATS". This text string is located in the upper left corner of the ATS application before the test name. This string is useful when using the AppActivate command located in the Language reference section of AP Basic.

Example

```
Sub Main
  AppActivate ATS.Application.Name
  SendKeys "%WC",1        'Clear all windows on page.
  SendKeys "%PO",1        'Display Data Editor.

  'In Debug mode focus is automatically returned to
  ' the editor each time the user interacts with the
  ' controls. Therefore it is important to note that
  ' sections of code containing commands that are to
  ' be sent to other applications via the SendKeys
  ' command need to be executed without interruption.

  'When debugging these areas place a breakpoints
  ' before and after the SendKeys commands to
  ' maintain
  ' the correct window/application focus.
End Sub
```

ATS.Application.NewData — Method

Syntax `ATS.Application.NewData`

Result Boolean

True	Data removed from memory.
False	Command failed to remove data from memory.

Description This command deletes the measurements currently in memory. The command is functionally the same as selecting File, New, Data from the Menu bar.

Example

```
Sub Main
  ATS.File.OpenTest "FRQ-RESP.ATS2"
  ATS.Application.NewData
  ATS.Sweep.Start
  ATS.File.SaveDataAs "FRQ-RESP.ATSA"
  ATS.File.OpenTest "THD-FRQ.ATS2"
  ATS.Application.NewData
  ATS.Sweep.Start
  ATS.File.SaveDataAs "THD-FRQ.ATSA"
  ATS.File.OpenTest "RESIDNOI.ATS2"
  ATS.Application.NewData
  ATS.Sweep.Start
  ATS.File.SaveDataAs "RESIDNOI.ATSA"
End Sub
```

ATS.Application.NewMacro — (OLE) Method

Syntax `ATS.Application.NewMacro`

Result Boolean

True	New macro created.
False	Command failed to create new macro.

Description This command initializes the macro editor and is only to be used via OLE. The command is functionally the same as selecting File, New, Macro, and OK from the Menu bar.

ATS.Application.NewTest

Method

Syntax **ATS.Application.NewTest**

Result Boolean

True	New test panel configuration restored.
False	Command failed to restore new test panel configuration.

Description This command initializes the current ATS test to the default test condition. The command is functionally the same as selecting New Test from the Standard Toolbar or selecting File, New, Test, and OK from the Menu bar.

Example

```
Sub Main
  ATS.Application.NewTest
  ATS2.AGen.OutputOn = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS2.Inst.Analyzer.FuncFilterLP = apbAnlrLP20k
  A = ATS2.Inst.Analyzer.FuncFilterLP
  ATS.Sweep.Source(1).Start("Hz") = 30000
  ATS.Sweep.Start
End Sub
```

ATS.Application.Page

Property

Syntax **ATS.Application.Page**

Data Type Integer

1	Page #1.
2	Page #2.
3	Page #3.
4	Page #4.
5	Page #5.

Description This command displays the selected page,

Example

```
Sub Main
  ATS.Application.NewTest
  ATS.Application.Page = 1
  Return = ATS.Application.Page
```

```
    Debug.Print "Page "; Return; " displayed."
    Wait 1   'So the user can see the page change.
    ATS.Application.Page = 2
    Return = ATS.Application.Page
    Debug.Print "Page "; Return; " displayed."
    Wait 1
    ATS.Application.Page = 3
    Return = ATS.Application.Page
    Debug.Print "Page "; Return; " displayed."
End Sub
```

ATS.Application.PanelClose — Method

Syntax **ATS.Application.PanelClose(**ByVal *PanelID* As Constant)

Parameter

Name	Description
PanelID	apbAnalogGen = Remove Analog Generator panel from view. apbAnalyzer = Remove the Analyzer panel from view. apbBarGraph? = Remove the desired Bar Graph 1 through 32 from view. apbDataEditor = Remove the Data Editor panel from view. apbDCX = Remove the DCX-127 panel from view. apbDiagnostic = Remove the Diagnostic panel from view. apbDigIO = Remove the Digital Input / Output panel from view. apbDigitalGen = Remove the Digital Generator panel from view. apbDIOStatusBits = Remove the Status Bits panel from view. apbGraph = Remove the Graph from view. apbRegulatio = Remove the Regulation panel from view. apbSettling = Remove the Settling panel from view. apbSpeaker = Remove the Speaker panel from view. apbSweep = Remove the Sweep panel from view. apbSwitcher = Remove the Switcher panel from view.

Description This command closes the selected panel,

Example

```
Sub Main
  ATS.Application.NewTest
  ATS.Application.PanelOpen(apbSweep, apbSmall)
  ATS2.AGen.OutputOn = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS2.Inst.Analyzer.FuncFilterHP = apbAnlrHP400
  ATS.Application.Page = 3
  ATS.Application.PanelClose(apbDigIO)
  ATS.Application.Page = 2
  ATS.Sweep.Start
End Sub
```

ATS.Application.PanelOpen — Method

Syntax

ATS.Application.PanelOpen(ByVal *Panel* As Constant[, ByVal Size As Constant]**)**

Parameter

Name	Description
Panel	apbAnalogGen = Display Analog Generator panel. apbAnalyzer = Display Analyzer panel. apbBarGraph? = Display Bar Graph panel 1 through 32. apbDataEditor = Display Data Editor panel. apbDCX = Display DCX-127 panel. apbDiagnostic = Display Diagnostic panel. apbDigIO = Display Digital Input / Output panel. apbDigitalGen = Display Digital Generator panel. apbDIOStatusBits = Display Status Bits panel. apbGraph = Display Graph panel. apbRegulation = Display Regulation panel. apbSettling = Display Settling panel. apbSpeaker = Display Speaker panel. apbSweep = Display Sweep panel. apbSwitcher = Display Switcher panel.
Size	apbSmall = Display small version of panel apbLarge = Display large version of panel

Description This command displays the selected panel on the current page.

Example See example for `ATS.Application.PanelClose`.

ATS.Application.Quit Method

Syntax **`ATS.Application.Quit`**

Description This command terminates ATS and returns to Windows. If the "Prompt to Save Test when a test is closed" selection in the Utilities, Config menu is enabled the operator will be prompted to save changed files when ATS-2 quits.

Example

```
Sub Main
Start:
  ChDir MacroDir
  Begin Dialog UserDialog 430,105
     PushButton 20,21,380,28,"Your Code",.Field1
     PushButton 130,63,180,28,"Exit ATS",.Field3
  End Dialog
  Dim Main_Menu As UserDialog
  Select Case Dialog(Main_Menu)
     Case 1
        'Incert your code here...
     Case Else
        ATS.Application.Quit   'Exit ATS
  End Select
  GoTo Start:
End Sub
```

ATS.Application.Restore Method

Syntax **`ATS.Application.Restore`**

Description This command restores the hardware to the present state of the software.

This function should be used if the hardware loses power or becomes disconnected from the computer.

Example

```
Sub Main
```

```
   Start:
   Begin Dialog UserDialog 430,105,"Example Menu"
      PushButton 40,28,170,42,"Restore _
         Hardware",.Field1
      PushButton 230,28,160,42,"Exit Macro",.Field2
   End Dialog
   Dim Main_Menu As UserDialog

   Select Case Dialog(Main_Menu)
      Case 1
         ATS.Application.Restore
      Case Else
         End
   End Select
   GoTo Start:
End Sub
```

ATS.Application.SetWatchDogTimer Method

Syntax

ATS.Application.SetWatchDogTimer(ByVal *Number* As Integer, ByVal *Sec* As Double [, Optional ByVal *ThrowError* As Variant]**)**

Parameter

Name	Description
Number	1 or 2 Two timers can be defined.
Sec	Defines the amount of time that will elapse after starting the WatchDog Timer before the ATSEvent_OnWatchDogTimeout event is generated. To disable the timer at any time set the time value to (0) zero seconds.
ThrowError	Optional parameter. Set this parameter to True to throw/raise an error (11021) when the defined time has elapsed. Basic's On Error mechanism can then detect the error. The default (False) condition will not throw/raise an error when the defined time has elapsed.

Description

This command sets up and starts the defined timer. When the defined time expires the ATSEvent_OnWatchDogTimeout event is

generated. In addition an error can be thrown/raised to allow Basic's On Error mechanism to intercept the error.

Example

```
Dim Halt As Boolean
Sub Main
  Halt = False
  ATS.Application.NewTest
  ATS2.AGen.OutputOn = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS.Sweep.Source(1).Steps = 30
  ATS.Application.SetWatchDogTimer(1, 5.0 ,False)
  ATS.Sweep.StartNoWait
  Do
  Loop While Halt = False
End Sub
Sub ATSEvent_OnWatchDogTimeout(ByVal Id As Long)
  If Id = 1 Then
    If ATS.Sweep.IsRunning = True Then
      ATS.Sweep.Stop
      Debug.Print "Sweep Stopped"
    End If
  End If
End Sub
```

ATS.Application.SysType — Method

Syntax **ATS.Application.SysType**

Result String

Description This command returns the path of the test (.AT2R) that is currently loaded.

Example

```
Sub Main
  Select Case(ATS.Application.SysType)
    Case "ATS-2"
      ATS.Prompt.Text = "ATS configured for _
        ATS-2 hardware."
  End Select
  ATS.Prompt.ShowWithContinue
```

```
   Stop
End Sub
```

ATS.Application.TempDir Method

Syntax **ATS.Application.TempDir**

Result String

Description This command returns the user's Windows temp directory. The default temp directory is "`C:\Documents and Settings\username\Local Settings\Temp`".

ATS.Application.TestDir Method

Syntax **`ATS.Application.TestDir`**

Result String

Description This command returns the path of the test (.ATS2) that is currently loaded.

Example

```
Sub Main
   ATS.Application.DisplayDataOnTestOpen = True
   ATS.File.OpenTest "SAMPLE1.ATS2"
   TestName$ = ATS.Application.TestName
   TestDir$ = ATS.Application.TestDir
   String1$ = "Test file "
   String2$ = " was loaded from the "
   String3$ = " directory."
   ATS.Prompt.Text = String1$ & TestName$ & String2$ _
      & TestDir$ & String3$
   ATS.Prompt.FontSize = 10
   ATS.Prompt.Position -1,-1,300,150
   ATS.Prompt.ShowWithContinue
   Stop
End Sub
```

ATS.Application.TestName — Method

Syntax `ATS.Application.TestName`

Result String

Description This command returns the test (.ATS2) file name of the test that is currently loaded.

Example See example for `ATS.Application.TestDir`.

ATS.Application.ThrowErrors — Property

Syntax `ATS.Application.ThrowErrors`

Data Type Boolean

True	Expose Errors and Warrnings.
False	Don't expose Errors and Warrnings..

Description This command exposes errors and warrnings generated by ATS to the Err. object.

See Appendix D Extensions Error Codes for Error String numbers and descriptions.

Example

```
Sub Main
   ' Pick one the three On Error possiblities below
   'On Error GoTo 0  'Disable your error handler
                     '(default). Basic will handle
                     'the error by termination.
   On Error GoTo MyErrorHandler ' Send error
                     'conditions to "MyHandler"
   'On Error Resume Next   ' Error conditions continue
                     'execution at the next statement.
         'Caution - This is generally very dangerous
         ' as no error will be seen
         'ATS will not send errors to Basic's
         ' "On Error" unless ATS.Application.
         ' ThrowErrors is set to True
         'After this is set to True, ATS will
         ' no longer display errors, they will all
```

```
        ' be passed to Basic
   ATS.Application.ThrowErrors = True
   'Now cause an error and see what happens.
   ATS2.AGen.Ampl(apbChA, "Vrms") = 111.9
   ' Cause another error and see what happens.
   ATS2.AGen.Freq(apbChA, "Hz") = 1.0
   MsgBox "Resumed after the offending Call"
Exit Sub' Exit to avoid handler.

MyErrorHandler:
   'Show some debug info
   Debug.Print "Err=";Err.Number
   Debug.Print "Description=";Err.Description
   Debug.Print "Source=";Err.Source

   'Select different actions for errors
   Select Case Err.Number    ' Evaluate error number
      Case 8504
         '"Generator Amplitude" error.
         'Put your error handler code here
         MsgBox "Got to the Handler"
         'If you handled the error, then resume
         Resume Next
      Case Else
         'Handle other situations here...
         'If we don't know about the err then or
         ' instead you could decide that Basic
         ' Should handle this
         'Note that if this is a called subroutine,
         ' Basic will pass the error back to the
         ' calling subroutine.
         'Passing all the info:
         Err.Raise(Err.Number, Err.Source _
            ,Err.Description)
         ' Or more simply
         Error Err
         ' Or you could exit this subroutime
         Exit Sub
   End Select
End Sub
```

ATS.Application.Version — Method

Syntax **ATS.Application.VisibleMacroEditor**

Result Double

Description This command returns the running ATS Application Version number. This command can be used to check if the running version of ATS is compatible with the running macro.

Example

```
Sub Main
  If ATS.Application.Version < 1.0 Then End
  ATS.Application.NewTest
  ATS.Application.PanelOpen(apbSweep, apbSmall)
  ATS2.AGen.OutputOn = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS2.Inst.Analyzer.FuncFilterHP = apbAnlrHP400
  ATS.Application.Page = 3
  ATS.Application.PanelClose(apbDigIO)
  ATS.Application.Page = 2
  ATS.Sweep.Start
End Sub
```

ATS.Application.Visible — Property

Syntax **ATS.Application.Visible**

Data Type Boolean

True	Restore ATS to view.
False	Remove ATS from view.

Description This command when executed makes the ATS window visible or invisible. The Macro Editor remains visible.

Example

```
Sub Main
  ATS.Application.Visible = False
  ATS.Application.NewTest
  ATS2.AGen.OutputOn = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS.Sweep.Start
```

```
  ATS.Application.Visible = True
End Sub
```

ATS.Application.VisibleMacroEditor Property

Syntax **ATS.Application.VisibleMacroEditor(**ByVal *bVisible* As Boolean**)**

Data Type Boolean

True	Restore Macro Editor to view.
False	Remove Macro Editor from view.

Description This command when executed makes the ATS Macro Editor visible or invisible. Dialogs displayed when the Macro Editor is invisible have a higher Z-order (which window is on top of another) than the ATS window, therefore when focus is moved to the ATS window the dialog remains displayed on top of the ATS application. If the Macro Editor is visible then the Z-order is relative to the Macro Editor and the dialog may be covered by any other window that has focus.

Example

```
Sub Main
  ATS.Application.VisibleMacroEditor = False
  ATS.Application.NewTest
  ATS2.AGen.OutputOn = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS.Sweep.Start
  ATS.Application.VisibleMacroEditor = True
End Sub
```

ATS.Application.VisibleOnTestLoad Property

Syntax **ATS.Application.Visible(**ByVal ID As Constant**)**

Data Type Boolean

True	Restore to view.
False	Remove from view.

Parameter	Name	Description
	ID	apbAll = This constant enables or disables display of the Graph and Bar-Graph displays, Data Editor, and Panels when a test is loaded during Macro execution only. apbBarGraphs = This constant enables or disables display of the Bar-Graph display, when a test is loaded during Macro execution only. Use this command at the beginning of your macro to decrease overall test times. apbDataEditor = This constant enables or disables display of the Data Editor panel when a test is loaded during Macro execution only. Use this constant at the beginning of your macro to decrease overall test times. apbGraph = This constant enables or disables display of the Graph display when a test is loaded during Macro execution only. Use this constant at the beginning of your macro to decrease overall test times. apbPanels = This constant enables or disables display of the Panels when a test is loaded during Macro execution only. Use this constant at the beginning of your macro to decrease overall test times.

Description This command enables or disables display of specified sections when a test is loaded during Macro execution only. Use this command at the beginning of your macro to decrease overall test times.

Example

```
Sub Main
  ATS.Application.VisibleOnTestLoad(apbAll) = False
  ATS.File.OpenTest("SAMPLE1.ATS2")
  Wait 5
  ATS.Application.VisibleOnTestLoad(apbPanels) = True
  ATS.File.OpenTest("SAMPLE1.ATS2")
  Wait 5
  ATS.Application.VisibleOnTestLoad(apbGraphs) = True
  ATS.File.OpenTest("SAMPLE1.ATS2")
End Sub
```

ATS.Application.WorkingDir — Property

Syntax `ATS.Application.WorkingDir`

Data Type String

Description This command sets or returns the current working directory. This command is like the `ChDir$` command in the Language reference section of AP Basic with the exception that this command can be used from an OLE client to change the ATS working directory.

Example

```
Private Sub Form_Load()
   Dim ATS As Object
   Set ATS = ("ATS.Application")
   'The following line makes the ATS Working Directory
   '  the same as the VB current directory.
   If ATS.Application.AppDir <> CurDir Then
      ATS.Application.WorkingDir = CurDir
      'Your code goes here.
   End If
End Subo
```

Chapter 4

Auxiliary Instrument

ATS.Aux.ReadingRdg — Property

Syntax `ATS.Aux.ReadingRdg(ByVal Number As Constant)`

Data Type Double

Parameter

Name	Description
Number	apbAux1 = Auxiliary Instrument 1 apbAux2 = Auxiliary Instrument 2 apbAux3 = Auxiliary Instrument 3 apbAux4 = Auxiliary Instrument 4

Description This command returns a settled reading for Auxiliary Instrument Reading and zeros the ready count.

See Also `ATS.Aux.ReadingReady, ATS.Aux.ReadingSettling, ATS.Aux.ReadingTrig`

Example

```
' Uses the ATS-GPIB Library GPIBLIB.ATSB
' A National Instruments GPIB card must be installed
' in your system to use this file.
'#Uses "gpib-lib.atsb"
' See the GPIB-LIB.atsb file for instructions on use.
'#Uses "APNiglob.bas"
'#Uses "APVbib32.bas"
Public iAP As Integer

Sub Main
Dim iStatus As Integer, iAddr As Integer, _
  iAnyOneHome As Integer, sResponse As String

  iAP = ildev(0, 1, NO_SAD, T3s, 1, 0) 'Open I/O to _
     this GPIB address  ** Assumes Board 0, Address 1
```

```
   iStatus = illn(iAP, 1, NO_SAD, iAnyOneHome)
   'Check for listener at address 1
   If iAnyOneHome Then 'Found a listener at address 1
      iStatus = ilclr(iAP)   'Device clear
      GpibWrite iAP, "*IDN?" 'Query for Instrument _
         Identificaiton
      sResponse = GpibRead(iAP, 60) 'Get response
      If Not (ibsta And EERR) Then  'If no GPIB _
         read error Then save response string
         GpibWrite iAP, "*CLS;*RST;"
   'Clear status registers and reset all settings
      End If
   End If

   result = GpibWrite(iAP, ":HEADER OFF;")
   result = GpibWrite(iAP, ":SETTLE OFF;")
   result = GpibWrite(iAP, ":OUTPUT ON;")

   ATS.File.OpenTest("AUX GPIB Example.at2R")
   ATS.Aux.ReadingSettling(apbAux1, 1.0, 0.0000001, 3,
0.03, apbExponential)
   ATS.Aux.Setting(apbAux1) = 1000.0
'Set frequency for sweep to return to when done
   ATS.Sweep.Start
End Sub
Sub ATSEvent_OnSweepTrigger()
   ATS.Aux.ReadingTrig(apbAux1)
   While ATS.Aux.ReadingReady(apbAux1) = 0
      result = GpibWrite(iAP, ":M1?;")
      Str1 = GpibRead(iAP,80)'Read METER M1 result

      Debug.Print "Reading = " & Str1
      ATS.Aux.SetReading(apbAux1, Val(Str1))
      Wait .1
   Wend
   Debug.Print "Settled Reading = " & Str1
End Sub
Sub ATSEvent_OnSweepStep(Value As Variant, Source As
_
      Long)
   Value = Format(Value, "###.####")
```

```
   Debug.Print "Setting = " & Value
   'GPIB Code to set ATS-2 Generator Frequency
   ' to "Value" variable
   result = GpibWrite(iAP, ":GFREQUENCY " & _
      Str$(Value)&";")     'Set Aux Generator Freq
End Sub
```

ATS.Aux.ReadingReady — Property

Syntax **ATS.Aux.ReadingReady(**ByVal *Number* As Constant)

Data Type Integer

0	Reading not ready.
>0	Reading ready.

Parameter

Name	Description
Number	apbAux1 = Auxiliary Instrument 1 apbAux2 = Auxiliary Instrument 2 apbAux3 = Auxiliary Instrument 3 apbAux4 = Auxiliary Instrument 4

Description This command returns the Auxiliary Instrument Reading settled reading ready count.

Because readings do not return until a reading is ready, this command may be used to avoid waiting for a reading. This command does NOT zero the ready count and so may be called any number of times. Only a call to the `ATS.Aux.ReadingRdg` or `ATS.Aux.ReadingTrig` commands will zero the ready count.

If the reading is found to be ready, a call to the `ATS.Aux.ReadingRdg` command will be guaranteed to return quickly.

See Also `ATS.Aux.ReadingRdg, ATS.Aux.ReadingSettling, ATS.Aux.ReadingTrig`

Example See example for `ATS.Aux.ReadingRdg`.

ATS.Aux.ReadingSettling Method

Syntax **ATS.Aux.ReadingSettling(**ByVal *Number* As Constant, ByVal *Tolerance* As Double, ByVal *Floor* As Double, ByVal *FloorUnit* As String, ByVal *Points* As Integer, ByVal *Delay* As Double, ByVal *Algorithm As Constant*)

Parameter See Appendix A for Settling Algorithm and parameter name descriptions.

Description This command sets the settling parameters for the ATS.Aux.ReadingRdg command.

See Also ATS.Aux.ReadingRdg, ATS.Aux.ReadingReady, ATS.Aux.ReadingTrig

Example See example for ATS.Aux.ReadingRdg.

ATS.Aux.ReadingTrig Method

Syntax **ATS.Aux.ReadingTrig(**ByVal *Number* As Constant)

Parameter

Name	Description
Number	apbAux1 = Auxiliary Instrument 1 apbAux2 = Auxiliary Instrument 2 apbAux3 = Auxiliary Instrument 3 apbAux4 = Auxiliary Instrument 4

Description Causes a restart of the reading cycle and zeros the ready count for the ATS.Aux.ReadingRdg command. The reading in progress is aborted.

See Also ATS.Aux.ReadingRdg, ATS.Aux.ReadingReady, ATS.Aux.ReadingSettling

Example See example for ATS.Aux.ReadingRdg.

ATS.Aux.SetReading — Method

Syntax `ATS.Aux.SetReading(ByVal Number As Constant, ByVal Value as Variant)`

Parameter

Name	Description
Number	apbAux1 = Auxiliary Instrument 1 apbAux2 = Auxiliary Instrument 2 apbAux3 = Auxiliary Instrument 3 apbAux4 = Auxiliary Instrument 4
Value	For *Number* 1 and 2 the *Value* Data Type is Double. For *Number* 3 and 4 the *Value* Data Type is Long.

Description This command sets the value used by the Auxiliary Instrument Reading parameter.

Example See example for `ATS.Aux.ReadingRdg`.

ATS.Aux.Setting — Property

Syntax `ATS.Aux.Setting(ByVal Number As Constant)`

Data Type Double

Parameter

Name	Description
Number	apbAux1 = Auxiliary Instrument 1 apbAux2 = Auxiliary Instrument 2 apbAux3 = Auxiliary Instrument 3 apbAux4 = Auxiliary Instrument 4

Description This command sets the value used by the Auxiliary Instrument Setting parameter.

Example See example for `ATS.Aux.ReadingRdg`.

User Notes

Chapter 5

Bar Graph

ATS.BarGraph.AxisAutoScale — Property

Syntax **ATS.BarGraph.AxisAutoScale(**ByVal *BarId* As Integer**)**

Data Type Boolean

True	Auto scale Bar Graph.
False	Disable auto scale.

Parameter

Name	Description
BarId	Bar Graph identification number (1-32). The identification number is located on the Bar Graph title bar.

Description Set the selected Bar Graph Axis to Auto Scale.

Example

```
Sub Main
  ATS.Application.NewTest
  ATS2.AGen.OutputOn = True
  ATS2.AGen.Freq(apbChA, "Hz") = 3000.0
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS2.Inst.Analyzer.FuncMode = apbAnlrBandpass
  ATS2.Inst.Analyzer.FuncBPBRTuning = apbAnlrFixed
  ATS2.Inst.Analyzer.FuncBPBRFreq("Hz") = 3000.0

  With ATS.BarGraph
     GenFreqBar = .New
     .Id(GenFreqBar) = 5051
     .AxisLogLin(GenFreqBar) = apbLin
     .AxisRight(GenFreqBar,"Hz") = 3500.0
     .AxisLeft(GenFreqBar,"Hz") = 2500.0
     .AxisIncrement(GenFreqBar,"Hz") = 10.0
     AnlrFuncRdg = .New
     .Id(AnlrFuncRdg) = 6345
```

```
      .DigitsOnly(AnlrFuncRdg) = False
      .AxisLogLin(AnlrFuncRdg) = apbLin
      .AxisLeft(AnlrFuncRdg,"V") = 0.8
      .AxisRight(AnlrFuncRdg,"V") = 1.2
      .AxisAutoScale(AnlrFuncRdg) = True
      .TargetLower(AnlrFuncRdg,"V") = 0.95
      .TargetUpper(AnlrFuncRdg,"V") = 1.05
      .TargetRange(AnlrFuncRdg) = True
      .Reset(GenFreqBar)
      .Reset(AnlrFuncRdg)

      String1$ = "Adjust Generator Frequency using _
         Bargraph #" & GenFreqBar
      String2$ = " for Maximum Amplitude on _
         Bargraph #" & AnlrFuncRdg & "."
      ATS.Prompt.Text = String1$ & String2$
      ATS.Prompt.Position(0,0,1150,120)
      ATS.Prompt.ShowWithContinue
      Stop

      GenMaxSet = .Max(GenFreqBar)
      GenMinSet = .Min(GenFreqBar)
      AnlrMaxRdg = .Max(AnlrFuncRdg)
      AnlrMinRdg = .Min(AnlrFuncRdg)
   End With

   MaxSet$ = "Maximum Frequency = " _
      & Left(Str$(GenMaxSet),6) & " Hz" & Chr(13)
   MinSet$ = "Minimum Frequency = " _
      & Left(Str$(GenMinSet),6) & " Hz" & Chr(13) _
      & Chr$(13)
   MaxRdg$ = "Maximum Voltage = " _
      & Left(Str$(AnlrMaxRdg),6) & " V" & Chr(13)
   MinRdg$ = "Minimum Voltage = " _
      & Left(Str$(AnlrMinRdg),6) & " V" & Chr(13) _
      & Chr$(13)
   CurSet$ = "Current Frequency Setting = " _
      & Left(Str$(Gen.Freq("Hz")),6) & " Hz" & Chr(13)
   CurRdg$ = "Current Amplitude Reading = " _
      & Left(Str$(Anlr.FuncRdg("V")),6) & " V"
```

```
    ATS.Prompt.Text = MaxSet$ & MinSet$ & MaxRdg$ _
       & MinRdg$ & CurSet$ & CurRdg$
    ATS.Prompt.Position(0,0,550,350)
    ATS.Prompt.ShowWithContinue
    Stop
End Sub
```

ATS.BarGraph.AxisIncrement — Property

Syntax **ATS.BarGraph.AxisIncrement(**ByVal *BarId* As Integer, ByVal *Unit* As String**)**

Data Type Double

Parameter

Name	Description
BarId	Bar Graph identification number (1-32). The identification number is located on the Bar Graph title bar.
Unit	Refer to the setting or reading defined by the ATS.BarGraph.Id command to determine the appropriate unit selections.

Description Set the selected Bar Graph increment decrement size. When the Bar Graph is configured to control a setting (for example the generator frequency) the arrow keys can be used to increment or decrement the frequency by the increment value.

Example See example for ATS.BarGraph.AxisAutoScale.

ATS.BarGraph.AxisLeft — Property

Syntax **ATS.BarGraph.AxisLeft(**ByVal *BarId* As Integer, ByVal *Unit* As String**)**

Data Type Double

Parameter

Name	Description
BarId	Bar Graph identification number (1-32). The identification number is located on the Bar Graph title bar.

	Unit	Refer to the setting or reading defined by the ATS.BarGraph.Id command to determine the appropriate unit selections.

Description This command defines the value on the left side of the Bar Graph.

See Also ATS.BarGraph.AxisRight, ATS.BarGraph.AxisAutoScale

Example See example for ATS.BarGraph.AxisAutoScale.

ATS.BarGraph.AxisLogLin — Property

Syntax **ATS.BarGraph.AxisLogLin(**ByVal *BarId* As Integer**)**

Data Type Constant

apbLog	Logarithmic axis.
apbLin	Linear axis.

Parameter	Name	Description
	BarId	Bar Graph identification number (1-32). The identification number is located on the Bar Graph title bar.

Description This command determines the Bar Graph axis data scaling type.

Example See example for ATS.BarGraph.AxisAutoScale.

ATS.BarGraph.AxisRight — Property

Syntax **ATS.BarGraph.AxisRight(**ByVal *BarId* As Integer**)**

Data Type Double

Parameter	Name	Description
	BarId	Bar Graph identification number (1-32). The identification number is located on the Bar Graph title bar.

	unit$	Refer to the setting or reading defined by the `ATS.BarGraph.Id` command to determine the appropriate unit selections.

Description This command defines the value on the right side of the Bar Graph.

See Also `ATS.BarGraph.AxisLeft`, `ATS.BarGraph.AxisAutoScale`

Example See example for `ATS.BarGraph.AxisAutoScale`.

ATS.BarGraph.Comment — Property

Syntax **`ATS.BarGraph.Comment(`**`ByVal` *`BarId`* `As Integer`**`)`**

Data Type String — ASCII characters.

Parameter

Name	Description
BarId	Bar Graph identification number (1-32). The identification number is located on the Bar Graph title bar.

Description This command transfers the ASCII characters to or from the comment section in the BarGraph panel to a string variable.

See Also `ATS.BarGraph.CommentShow`

Example

```
Sub Main
  ATS.Application.NewTest
  ATS2.AGen.OutputOn = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  With ATS2.Inst.Analyzer
     .FuncMode = apbAnlrBandpass
     .FuncBPBRTuning = apbAnlrFixed
     .FuncBPBRFreq("Hz") = 3000.0
  End With
  With ATS.BarGraph
     BarID1 = .New(6345)
     .AxisLeft(BarID1,"Hz") = 2500.0
     .AxisRight(BarID1,"Hz") = 3500.0
     .AxisIncrement(BarID1,"Hz") = 1.0
     .Title(BarID1) = "Bar Graph 1: _
        Analog Generator Frequency"
```

```
      BarID2 = .New(5907)
      .AxisLeft(BarID2,"V") = 0.50
      .AxisRight(BarID2,"V") = 1.50
      .CommentShow(BarID2) = True
      .Title(BarID2) = "Analog Analyzer Bandpass _
         Amplitude"
      .Comment(BarID2) = "Adjust Bar Graph #1 for _
         maximum amplitude reading."
   End With
   With ATS.Prompt
      .FontSize = 8
      .Position(290,244,225,120)
      .Text = Chr$(10) & "Press this button to _
         proceed."
      .ShowWithContinue
      Stop
   End With
   Debug.Print "Filter peek = " & _
      ATS2.AGen.Freq("Hz") & " Hz"
End Sub
```

ATS.BarGraph.CommentShow — Property

Syntax ATS.BarGraph.CommentShow

Data Type Boolean

True	Display Comment section.
False	Remove Comment section from view.

Description This command displays or removes from view the comment section in the Graph panel

See Also ATS.BarGraph.Comment

Example See example for ATS.BarGraph.Comment.

ATS.BarGraph.DigitsOnly Property

Syntax `ATS.BarGraph.DigitsOnly(ByVal BarId As Integer)`

Data Type Boolean

True	Display digits only.
False	Display digits and Bar Graph.

Parameter

Name	Description
BarId	Bar Graph identification number (1-32). The identification number is located on the Bar Graph title bar.

Description This command displays only the digits (numeric characters) or the digits and the bar on the Bargraph.

Example See example for `ATS.BarGraph.AxisAutoScale`.

ATS.BarGraph.Id Property

Syntax `ATS.BarGraph.Id(ByVal BarId As Integer)`

Data Type Long Instrument Parameter ID#.

Parameter

Name	Description
BarId	Bar Graph identification number (1-32). The identification number is located on the Bar Graph title bar.

Description This command is used to select the instrument parameter, which will return readings or control settings for the selected Bar Graph.

Refer to Appendix B to obtain instrument parameter identification numbers.

Example See example for `ATS.BarGraph.AxisAutoScale`.

ATS.BarGraph.Max Property

Syntax `ATS.BarGraph.Max(ByVal BarId As Integer, ByVal Unit As String)`

Parameter	Name	Description
	BarId	Bar Graph identification number (1-32). The identification number is located on the Bar Graph title bar.
	Unit	Refer to the setting or reading defined by the `ATS.BarGraph.Id` command to determine the appropriate unit selections.

Result Double

Description This command returns the maximum measured value obtained during the time since the last reset for the selected Bar Graph

See Also `ATS.BarGraph.Reset, ATS.BarGraph.Min`

Example See example for `ATS.BarGraph.AxisAutoScale`.

ATS.BarGraph.Min — Property

Syntax **`ATS.BarGraph.Min(`**`ByVal` *`BarId`* `As Integer, ByVal` *`Unit`* `As String`**`)`**

Parameter	Name	Description
	BarId	Bar Graph identification number (1-32). The identification number is located on the Bar Graph title bar.
	Unit	Refer to the setting or reading defined by the `ATS.BarGraph.Id` command to determine the appropriate unit selections.

Result Double

Description This command returns the minimum measured value obtained during the time since the last reset for the selected Bar Graph

See Also `ATS.BarGraph.Reset, ATS.BarGraph.Max`

Example See example for `ATS.BarGraph.AxisAutoScale`.

ATS.BarGraph.New — Method

Syntax **`ATS.BarGraph.New[(`**`Optional ByVal` *`ConId`* `As Variant`**`)]`**

Parameter	Name	Description
	ConId	Instrument identification number. Refer to Appendix B to obtain instrument parameter identification numbers.

Result Integer

1-32	Identification number of Bar Graph created.

Description This command creates a new Bar Graph and returns the identification number.

Example See example for `ATS.BarGraph.AxisAutoScale`.

ATS.BarGraph.Reset — Method

Syntax **`ATS.BarGraph.Reset(`**`ByVal` *`BarId`* `As Integer`**`)`**

Parameter	Name	Description
	BarId	Bar Graph identification number (1-32). The identification number is located on the Bar Graph title bar.

Description This command resets the selected Bar Graph. The reset action sets the Min and Max. values to the current reading and as additional readings are taken the Min and Max. readings track the deviations

See Also `ATS.BarGraph.Max, ATS.BarGraph.Min`

Example See example for `ATS.BarGraph.AxisAutoScale`.

ATS.BarGraph.TargetLower — Property

Syntax **`ATS.BarGraph.TargetLower(`**`ByVal` *`BarId`* `As Integer, ByVal` *`Unit`* `As String`**`)`**

Data Type Double

Parameter	Name	Description
	BarId	Bar Graph identification number (1-32). The identification number is located on the Bar Graph title bar.

Unit	Refer to the setting or reading defined by the `ATS.BarGraph.Id` command to determine the appropriate unit selections.

Description This command defines the target value for the left side of the Bar Graph.

See Also `ATS.BarGraph.TargetUpper`, `ATS.BarGraph.TargetRange`

Example See example for `ATS.BarGraph.AxisAutoScale`.

ATS.BarGraph.TargetRange — Property

Syntax **`ATS.BarGraph.TargetRange(`**`ByVal` *`BarId`* `As Integer`**`)`**

Data Type Boolean

True	Target area displayed.
False	Target area not displayed.

Parameter

Name	Description
BarId	Bar Graph identification number (1-32). The identification number is located on the Bar Graph title bar.

Description This command turns the selected Bar Graph Target Range ON or OFF.

See Also `ATS.BarGraph.TargetLowe`, `ATS.BarGraph.TargetUpper`

Example See example for `ATS.BarGraph.AxisAutoScale`.

ATS.BarGraph.TargetUpper — Property

Syntax **`ATS.BarGraph.TargetUpper(`**`ByVal` *`BarId`* `As Integer, ByVal Unit As String)`

Data Type Double

Parameter	Name	Description
	BarId	Bar Graph identification number (1-32). The identification number is located on the Bar Graph title bar.
	Unit	Refer to the setting or reading defined by the `ATS.BarGraph.Id` command to determine the appropriate unit selections.

Description This command defines the value on the right side of the Bar Graph.

See Also `ATS.BarGraph.TargetLower`, `ATS.BarGraph.TargetRange`

Example See example for `ATS.BarGraph.AxisAutoScale`.

ATS.BarGraph.Title Property

Syntax **`ATS.BarGraph.Title(`**`ByVal` *`BarId`* `As Integer`**`)`**

Data Type String ASCII charactors.

Parameter	Name	Description
	BarId	Bar Graph identification number (1-32). The identification number is located on the Bar Graph title bar.

Description This command transfers the ASCII characters to or from the title bar in the BarGraph panel to a string variable.

Example See example for `ATS.BarGraph.Comment`.

User Notes

Chapter 6

RS-232 Communication

ATS.Comm.Break — Property

Syntax `ATS.Comm(ByVal Num as Integer).Break`

Data Type Boolean

True	Sets the break signal.
False	Clears the break signal.

Parameter

Name	Description
Num	1 or 2 Two RS-232 communication channels can be defined at one time.

Description This command sets or clears the break signal. Setting the break signal to True stops sending characters and places the line in a break state until the Break command is set to False.

ATS.Comm.CDHolding — Property

Syntax `ATS.Comm(ByVal Num as Integer).CDHolding`

Data Type Boolean

True	Carrier Detect line high.
False	Carrier Detect line low.

Parameter

Name	Description
Num	1 or 2 Two RS-232 communication channels can be defined at one time.

Description This command returns the state of the Carrier Detect (CD) line. The state of the Carrier Detect line indicates to the computer whether or not the modem is online.

When the Carrier Detect line is high (CDHolding = True) and the time specified by the `ATS.Comm.CDTimeout` command has expired, the `ATS.Comm.CommError` command is set to comCDTO (Carrier Detect Timeout Error).

The Carrier Detect is also known as the Receive Line Signal Detect (RLSD).

See Also `ATS.Comm.CDTimeout`

ATS.Comm.CDTimeout — Property

Syntax **`ATS.Comm(`**`ByVal` *`Num`* `As Integer`**`).CDTimeout`**

Data Type Long

Parameter

Name	Description
Num	1 or 2 Two RS-232 communication channels can be defined at one time.

Description This command sets and returns the maximum amount of time (in milliseconds) that the control waits for the Carrier Detect (CD) signal before timing out. This command indicates a timeout condition by setting the `ATS.Comm.CommError` command to CDTO (Carrier Detect Timeout Error).

ATS.Comm.CommError — Property

Syntax **`Event = ATS.Comm(`**`ByVal` *`Num`* `As Integer`**`).CommError`**

Data Type Integer

The following list contains communications errors or events.

Setting	Value	Description
comBreak	*1001*	Break signal received.
comCTSTO	*1002*	Clear To Send Timeout. The Clear To Send line was low for the number of milliseconds specified

		by the ATS.Comm.CTSTimeout command while trying to send a character.
comDSRTO	*1003*	Data Set Ready Timeout. The Data Set Ready line was low for the number of milliseconds specified by the ATS.Comm.DSRTimeout command while trying to send a character.
comFrame	*1004*	Framing Error. The hardware detected a framing error.
comOverrun	*1006*	Port Overrun. A character was not read from the hardware before the next character arrived and was lost.
comCDTO	*1007*	Carrier Detect Timeout. The Carrier Detect line was low for the number of milliseconds specified by the ATS.Comm.CDTimeout command while trying to send a character.
comRxOver	*1008*	Receive Buffer Overflow. The receive buffer is full.
comRxParity	*1009*	Parity Error. Parity error detected.
comTxFull	*1010*	Transmit Buffer Full. The transmit buffer was full while trying to queue a character.

Parameter	Name	Description
	Num	1 or 2 Two RS-232 communication channels can be defined at one time.

Description Returns the most recent communication error.

ATS.Comm.CommId — Property

Syntax `ATS.Comm(ByVal Num As Integer).CommId`

Data Type Integer

Parameter	Name	Description
	Num	1 or 2 Two RS-232 communication channels can be defined at one time.

Description This command returns a handle that identifies the communications device.

ATS.Comm.CommPort

Property

Syntax **ATS.Comm(**ByVal *Num* As Integer**).CommPort**

Data Type Integer

Parameter

Name	Description
Num	1 or 2 Two RS-232 communication channels can be defined at one time.

Description his command sets and returns the communications port number.

The communications control generates error 68 (Device unavailable) if the port does not exist.

Warning You must set ATS.Comm.CommPort before opening the port.

Example

```
Sub Main
   If ATS.Comm(1).PortOpen = True Then
      ATS.Comm(1).PortOpen = False
   End If

   'Port Setup
   ATS.Comm(1).CommPort = 2
   ATS.Comm(1).Settings = "9600,N,8,1"
   ATS.Comm(1).OutBufferSize = 10
   ATS.Comm(1).InBufferSize = 10

   'Output to Comm Port 2
   ATS.Comm(1).PortOpen = True
   ATS.Comm(1).Output = "1234567890"

   'Input from Comm Port 2
   Character$ = ATS.Comm(1).Input
   Debug.Print Character$

   ATS.Comm(1).PortOpen = False
End Sub
```

ATS.Comm.CTSHolding Property

Syntax `ATS.Comm(ByVal Num As Integer).CTSHolding`

Data Type Boolean

True	Clear To Send line high.
False	Clear To Send line low.

Parameter

Name	Description
Num	1 or 2 Two RS-232 communication channels can be defined at one time.

Description This command returns the state of the of the Clear To Send (CTS) line. The state of the Clear To Send line indicates to the computer whether or not the transmission can proceed.

When the Clear To Send line is low (CTSHolding = False) and the time specified by the `ATS.Comm.CTSTimeout` command has expired, the `ATS.Comm.CommError` command is set to comCTSTO (Clear To Send Timeout).

The Clear To Send line is used in RTS/CTS (Request To Send/Clear To Send) hardware handshaking. The `ATS.Comm.CTSHolding` command provides a way to manually determine the state of the Clear To Send line.

See Also `ATS.Comm.Handshaking`

ATS.Comm.CTSTimeout Property

Syntax `ATS.Comm(ByVal Num As Integer).CTSTimeout`

Data Type Long

Parameter

Name	Description
Num	1 or 2 Two RS-232 communication channels can be defined at one time.

Description This command sets and returns the maximum amount of time (in milliseconds) that the control waits for the Clear To Send (CTS) signal before timing out. This command indicates a timeout condition

by setting the `ATS.Comm.CommError` command to CTSTO (Clear To Send Timeout Error).

ATS.Comm.DSRHolding — Property

Syntax **`ATS.Comm(`**`ByVal` *`Num`* `As Integer`**`).DSRHolding`**

Data Type Boolean

`True`	Data Set Ready line high.
`False`	Data Set Ready line low.

Parameter

Name	Description
`Num`	1 or 2 Two RS-232 communication channels can be defined at one time.

Description This command returns the state of the of the Data Set Ready (DSR) line. The state of the Data Set Ready line indicates to the computer whether or not the hardware is ready to proceed.

ATS.Comm.DSRTimeout — Property

Syntax **`ATS.Comm(`**`ByVal` *`Num`* `As Integer`**`).DSRTimeout`**

Data Type Long

Parameter

Name	Description
`Num`	1 or 2 Two RS-232 communication channels can be defined at one time.

Description This command sets and returns the maximum amount of time (in milliseconds) that the control waits for the Data Set Ready (DSR) signal before timing out. This command indicates a timeout condition by setting the `ATS.Comm.CommError` command to DSRTO (Data Set Ready Timeout Error).

ATS.Comm.DTREnable — Property

Syntax **`ATS.Comm(`**`ByVal` *`Num`* `As Integer`**`).DTREnable`**

Data Type Boolean

True	Enable the Data Terminal Ready (line high) when port opened and (line Low) when the port is closed.
False	(Default) Disable the Data Terminal Ready (line always low).

Parameter	**Name**	**Description**
	Num	1 or 2 Two RS-232 communication channels can be defined at one time.

Description This command determines whether to enable the Data Terminal Ready (DTR) line during communications. Typically, the Data Terminal Ready signal is sent by a computer to its modem to indicate that the computer is ready to accept incoming data.

Setting the Data Terminal Ready line to low in most cases hangs up the telephone.

ATS.Comm.Handshaking Property

Syntax **`ATS.Comm(`**`ByVal Num As Integer`**`).Handshaking`**

Data Type Constant

apbComNone
(Default) No handshaking.

apbComXON_XOFF
XON/XOFF handshaking.

apbComRTS_CTS
RTS/CTS (Request To Send/Clear To Send) handshaking.

apbComSendXON_XOFF
Both Request To Send and XON/XOFF handshaking.

Parameter	**Name**	**Description**
	Num	1 or 2 Two RS-232 communication channels can be defined at one time.

Description This command sets and returns the state of the hardware handshaking.

Handshaking refers to the internal communications protocol by which data is transferred from the hardware port to the receive buffer. When a character of data arrives at the serial port, the communications device has to move it into the receive buffer so that your program can read it. If there is no receive buffer and your program is expected to read every character directly from the hardware, you will probably lose data because the characters can arrive very quickly.

A handshaking protocol insures that data is not lost due to a buffer overrun, in which case data arrives at the port too quickly for the communications device to move the data into the receive buffer.

ATS.Comm.InBufferCount — Property

Syntax `ATS.Comm(ByVal Num As Integer).InBufferCount`

Data Type Integer

Parameter

Name	Description
Num	1 or 2 Two RS-232 communication channels can be defined at one time.

Description This command returns the number of characters in the receive buffer.

ATS.Comm.InBufferSize — Property

Syntax `ATS.Comm(ByVal Num As Integer).InBufferSize`

Data Type Integer

Description This command sets and returns the size of the receive buffer in bytes. The default receive buffer size is 1024.

Parameter

Name	Description
Num	1 or 2 Two RS-232 communication channels can be defined at one time.

Example See example for `ATS.Comm.CommPort`.

ATS.Comm.Input — Property

Syntax `ATS.Comm(ByVal Num As Integer).Input`

Result String

Parameter

Name	Description
Num	1 or 2 Two RS-232 communication channels can be defined at one time.

Description This command returns and removes a string of characters from the receive buffer. `The ATS.Comm.InputLen` command defines the number of characters that are read by the `ATS.Comm.Input` command.

Example See example for `ATS.Comm.CommPort`.

ATS.Comm.InputLen — Property

Syntax `ATS.Comm(ByVal Num As Integer).InputLen`

Data Type Integer

Parameter

Name	Description
Num	1 or 2 Two RS-232 communication channels can be defined at one time.

Description This command sets and returns the number of characters the ATS.Comm.Input command reads from the receive buffer.

Setting the `ATS.Comm.InputLen` command to 0 causes the `ATS.Comm.Input` command to read the entire contents of the receive buffer.

If InputLen characters are not available in the receive buffer, the `ATS.Comm.Input` command returns a zero-length string (""). The `ATS.Comm.InBufferCount` command can also be checked to determine if the required number of characters are present before using the `ATS.Comm.Input` command.

ATS.Comm.Interval Property

Syntax `ATS.Comm(ByVal Num As Integer).Interval`

Data Type Long

Parameter	Name	Description
	Num	1 or 2 Two RS-232 communication channels can be defined at one time.

Description This command sets the interval (milliseconds) for polling the hardware for data under the Windows 3.0 operating system.

ATS.Comm.NullDiscard Property

Syntax `ATS.Comm(ByVal Num As Integer).NullDiscard`

Data Type Boolean

True	Null characters are not transferred from the port to the receive buffer.
False	(Default) Null characters are transferred from the port to the receive buffer.

Parameter	Name	Description
	Num	1 or 2 Two RS-232 communication channels can be defined at one time.

Description This command determines whether null characters are allowed into the receive buffer.

A null character is defined as ASCII character 0, Chr$(0).

ATS.Comm.OutBufferCount Property

Syntax `ATS.Comm(ByVal Num As Integer).OutBufferCount`

Data Type Integer

Parameter	Name	Description
	Num	1 or 2 Two RS-232 communication channels can be defined at one time.

Description This command returns the number of characters in the transmit buffer. The transmit buffer can be cleared by setting the `ATS.Comm.OutBufferCount` command to 0.

ATS.Comm.OutBufferSize Property

Syntax `ATS.Comm(ByVal Num As Integer).OutBufferSize`

Data Type Integer

Parameter	Name	Description
	Num	1 or 2 Two RS-232 communication channels can be defined at one time.

Description This command sets and returns the size, in characters, of the transmit buffer. The default transmit buffer size is 512 bytes.

Example See example for `ATS.Comm.CommPort`.

ATS.Comm.Output Property

Syntax `ATS.Comm(ByVal Num As Integer).Output`

Data Type Variant

Parameter	Name	Description
	Num	1 or 2 Two RS-232 communication channels can be defined at one time.

Description This command sends a string of characters to the transmit buffer.

Example See example for `ATS.Comm.CommPort`.

ATS.Comm.ParityReplace Property

Syntax `ATS.Comm(ByVal Num As Integer).ParityReplace`

Data Type String

Parameter

Name	Description
Num	1 or 2 Two RS-232 communication channels can be defined at one time.

Description This command sets and returns the character that replaces an invalid character in the data if a parity error occurs.

The parity bit refers to a bit that is transmitted along with a specified number of data bits to provide error checking. When you use a parity bit, the communications control adds up all the bits that are set (having a value of 1) in the data and tests the sum as being odd or even (according to the parity setting used when the port was opened).

By default, the control uses a question mark (?) character for replacing invalid characters. Setting ParityReplace to an empty string ("") disables replacement of the character where the parity error occurs.

ATS.Comm.PortOpen Property

Syntax `ATS.Comm(ByVal Num As Integer).PortOpen`

Data Type Boolean

True	Port is opened.
False	Port is closed or closes the port and clears the receive and transmit buffers.

Parameter

Name	Description
Num	1 or 2 Two RS-232 communication channels can be defined at one time.

Description This command sets and returns the state of the communications port.

If either the `ATS.Comm.DTREnable` or the `ATS.Comm.RTSEnable` commands are set to True before the port is opened, the state of each command is set to False when the port is closed. Otherwise, the DTR and RTS lines remain in their previous state.

Example See example for `ATS.Comm.CommPort`.

ATS.Comm.RTSEnable — Property

Syntax **`ATS.Comm(`**`ByVal` *`Num`* `As Integer`**`).RTSEnable`**

Data Type Boolean

True	Enables the Request To Send line (line set high when port open and low when port closed).
False	The default condition, disables the Request To Send line.

Parameter

Name	Description
Num	1 or 2 Two RS-232 communication channels can be defined at one time.

Description This command determines the state of the Request To Send line.

The Request To Send line is used in RTS/CTS hardware handshaking.

ATS.Comm.Settings — Property

Syntax **`ATS.Comm(`**`ByVal` *`Num`* `As Integer`**`).Settings`**

Data Type String

The following table lists the valid baud rates.

Setting	Description
110	
300	
600	
1200	

2400	
9600	(Default)
14400	
19200	
38400	
57600	
11500	
230400	
460800	
921600	

The following table describes the valid parity values.

Setting	Description
E	Even
M	Mark
N	None (Default)
O	Odd
S	Space

The following table lists the valid data bit values.

Setting	Description
4	
5	
6	
7	
8	(default)

The following table lists the valid stop bit values.

Setting	Description
1	(Default)
1.5	
2	

Parameter

Name	Description
Num	1 or 2 Two RS-232 communication channels can be defined at one time.

Description

This command sets and returns the baud rate, parity, data bit, and stop bit settings.

If paramString$ is not valid when the port is opened, the communications control generates error 380 (Invalid property value).

Settings$ consists of four parts as specified in the following format:

"B,P,D,S"

Part	Description
B	Baud rate
P	Parity
D	Number of data bits
S	Number of stop bits

The default value of Settings$ is: "9600,N,8,1"

Example

See example for `ATS.Comm.CommPort`.

User Notes

Chapter 7

Computes

ATS.Compute.Avg.Apply — Method

Syntax `ATS.Compute.Avg.Apply`

Result Boolean

True	Computation performed.
False	Computation NOT performed.

Description This command applies the Average computation to the selected data (1-6). All of the measurements in the selected data will be replaced with the average value of the data within the Start and Stop settings for the Compute Average function.

See Also `ATS.Compute.Clear.All, ATS.Compute.Avg.Data, ATS.Compute.Avg.PostSweep, ATS.Compute.Avg.Start, ATS.Compute.Avg.Stop,`

Example

```
Sub Main
  ATS.Application.NewTest
  ATS2.AGen.OutputOn = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS.Compute.Avg.Data(1) = True
  ATS.Compute.Avg.PostSweep = False
  ATS.Compute.Avg.Start("Hz") = 5000
  ATS.Compute.Avg.Stop("Hz") = 100
  ATS.Sweep.Start
  ATS.Compute.Avg.Apply
End Sub
```

ATS.Compute.Avg.Data Property

Syntax `ATS.Compute.Avg.Data(ByVal Source As Integer)`

Data Type Boolean

True	Select specified data.
False	Deselect specified data.

Parameter

Name	Description
Source	1 = Data 1 measurements 2 = Data 2 measurements 3 = Data 3 measurements 4 = Data 4 measurements 5 = Data 5 measurements 6 = Data 6 measurements

Description This command determines which data (1-6) the Average computation is to be performed on. By using this command several times to select multiple data sources, several Average computations can be performed in one operation.

See Also `ATS.Compute.Avg.Apply`

Example See example for `ATS.Compute.Avg.Apply`.

ATS.Compute.Avg.PostSweep Property

Syntax `ATS.Compute.Avg.PostSweep`

Data Type Boolean

True	Enable computation to be applyed after sweep.
False	Disable computation after sweep.

Description This command instructs the test to perform the Average computation after a sweep is complete and sets the state of the Apply After Sweep field on the Compute Average panel.

ATS retains the order in which the Apply After Sweep field on the Compute panels is enabled. This permits multiple computations to be

performed on data from a single test. The order of the computations is also retained in the test file.

See Also `ATS.Compute.Avg.Apply`

Example See example for `ATS.Compute.Avg.Apply`.

ATS.Compute.Avg.Start — Property

Syntax **`ATS.Compute.Avg.Start(`**`ByVal` *`Unit`* `As String`**`)`**

Data Type Double

Parameter

Name	Description
`Unit`	The desired unit has to be available to the sweep panel: Source 1 for X-Y plots and Data 2 for X-Y Data 2 On X plots.

Description This command sets the Start value of the data over which the Average computation will be performed.

See Also `ATS.Compute.Avg.Stop, ATS.Compute.Avg.Apply`

Example See example for `ATS.Compute.Avg.Apply`.

ATS.Compute.Avg.StartUnit — Method

Syntax **`ATS.Compute.Avg.StartUnit`**

Result String

Description This command returns the Unit used for the Start setting for the Compute Average function.

See Also `ATS.Compute.Avg.StopUnit`

Example

```
Sub Main
   ATS.Compute.Avg.Data(1) = True
   ATS.Compute.Avg.Start("Hz") = 20000.0
   Debug.Print ATS.Compute.Avg.StartUnit
End Sub
```

Output `Hz`

ATS.Compute.Avg.Stop — Property

Syntax **`ATS.Compute.Avg.Stop(`**`ByVal` *`Unit`* `As String`**`)`**

Data Type Double

Parameter

Name	Description
`Unit`	The desired unit has to be available to the sweep panel: Source 1 for X-Y plots and Data 2 for X-Y Data 2 On X plots.

Description This command sets the Stop value of the data over which the Average computation will be performed.

See Also `ATS.Compute.Avg.Start, ATS.Compute.Avg.Apply`

Example See example for `ATS.Compute.Avg.Apply`.

ATS.Compute.Avg.StopUnit — Method

Syntax **`ATS.Compute.Avg.StopUnit`**

Result String

Description This command returns the Unit used for the Stop setting for the Compute Average function.

See Also `ATS.Compute.Avg.StartUnit`

Example

```
Sub Main
   ATS.Compute.Avg.Data(1) = True
   ATS.Compute.Avg.Stop("Hz") = 20000.0
   Debug.Print ATS.Compute.Avg.StopUnit
End Sub
```

Output `Hz`

ATS.Compute.Center.Apply — Method

Syntax `ATS.Compute.Center.Apply`

Result Boolean

True	Computation performed.
False	Computation NOT performed.

Description This command applies the Center computation to the selected data (1-6).

See Also `ATS.Compute.Clear.All, ATS.Compute.Center.Data, ATS.Compute.Center.PostSweep, ATS.Compute.Center.Start, ATS.Compute.Center.Stop`

Example

```
Sub Main
  ATS.File.OpenTest "CENTER.ATS2"
  ATS.Compute.Clear.All
  ATS.Compute.Center.Data(1) = True
  ATS.Compute.Center.PostSweep = False
  ATS.Compute.Center.Start("Hz") = 200000
  ATS.Compute.Center.Stop("Hz") = 10
  ATS.Sweep.Start
  ATS.Compute.Center.Apply
End Sub
```

ATS.Compute.Center.Data — Property

Syntax `ATS.Compute.Center.Data(ByVal Source As Integer)`

Data Type Boolean

True	Select specified data.
False	Deselect specified data.

Parameter

Name	Description
Source	1 = Data 1 measurements 2 = Data 2 measurements 3 = Data 3 measurements 4 = Data 4 measurements

5 = Data 5 measurements
6 = Data 6 measurements

Description This command determines which data (1-6) the Center computation is to be performed on. By using this command several times to select multiple data sources, several Center computations can be performed in one operation.

See Also `ATS.Compute.Center.Apply`

Example See example for `ATS.Compute.Center.Apply`.

ATS.Compute.Center.PostSweep Property

Syntax **`ATS.Compute.Center.PostSweep`**

Data Type Boolean

`True`	Enable computation to be applyed after sweep.
`False`	Disable computation after sweep.

Description This command instructs the test to perform the Center computation after a sweep is complete and sets the state of the Apply After Sweep field on the ComputeCenter panel.

ATS retains the order in which the Apply After Sweep field on the Compute panels is enabled. This permits multiple computations to be performed on data from a single test. The order of the computations is also retained in the test file.

See Also `ATS.Compute.Center.Apply`

Example See example for `ATS.Compute.Center.Apply`.

ATS.Compute.Center.Start Property

Syntax **`ATS.Compute.Center.Start(`**`ByVal` *`Unit`* `As String`**`)`**

Data Type Double

Parameter	Name	Description
	Unit	The desired unit has to be available to the sweep panel: Source 1 for X-Y plots and Data 2 for X-Y Data 2 On X plots.

Description This command sets the Start value of the data over which the Center computation will be performed.

See Also `ATS.Compute.Center.Stop`, `ATS.Compute.Center.Apply`

Example See example for `ATS.Compute.Center.Apply`.

ATS.Compute.Center.StartUnit — Method

Syntax **`ATS.Compute.Center.StartUnit`**

Result String

Description This command returns the Unit used for the Start setting for the Compute Center function.

See Also `ATS.Compute.StopUnit`

Example

```
Sub Main
   ATS.Compute.Center.Data(1) = True
   ATS.Compute.Center.Start("Hz") = 0.02
   Debug.Print ATS.Compute.Center.StartUnit
End Sub
```

Output

```
Hz
```

ATS.Compute.Center.Stop — Property

Syntax **`ATS.Compute.Center.Stop(`**`ByVal` *`Unit`* `As String`**`)`**

Data Type Double

Parameter	Name	Description
	Unit	The desired unit has to be available to the sweep panel: Source 1 for X-Y plots and Data 2 for X-Y Data 2 On X plots.

Description This command sets the Stop value of the data over which the Center computation will be performed.

See Also `ATS.Compute.Center.Start`, `ATS.Compute.Center.Apply`

Example See example for `ATS.Compute.Center.Apply`.

ATS.Compute.Center.StopUnit — Method

Syntax **`ATS.Compute.Center.StopUnit`**

Result String

Description This command returns the Unit used for the Stop setting for the Compute Average function.

See Also `ATS.Compute.Center.StartUnit`

Example

```
Sub Main
   ATS.Compute.Center.Data(1) = True
   ATS.Compute.Center.Stop("F/R") = 20000.0
   Debug.Print ATS.Compute.Center.StopUnit
End Sub
```

Output

```
F/R
```

ATS.Compute.Clear.All — Method

Syntax **`ATS.Compute.Clear.All`**

Description This command clears all computes from the current test.

Example See example for `ATS.Compute.Center.Apply`.

ATS.Compute.Delta.Apply — Method

Syntax `ATS.Compute.Delta.Apply`

Result Boolean

True	Computation performed.
False	Computation NOT performed.

Description This command applies the Delta computation to the selected data (1-6).

See Also `ATS.Compute.Clear.All, ATS.Compute.Delta.Data, ATS.Compute.Delta.FileName, ATS.Compute.Delta.PostSweep`

Example

```
Sub Main
  ATS.File.OpenTest "DELTA.ATS2"
  ATS.Sweep.Start
  ATS.Compute.Delta.FileName = "DELTA1.ATSA"
  ATS.Compute.Delta.PostSweep = False
  ATS.Compute.Delta.Data(1,1) = True
  ATS.Compute.Delta.Apply
End Sub
```

ATS.Compute.Delta.Data — Property

Syntax `ATS.Compute.Delta.Data(ByVal Source As Integer, ByVal Column As Integer)`

Data Type Boolean

True	Select specified data.
False	Deselect specified data.

Parameter

Name	Description
Source	Number of the Sweep Data (1-6) of the data in memory.
Column	Number of the Data Column (0-7) of the data specified by the `ATS.Compute.Delta.FileName` command.

Description This command determines which data (Data 1-6) in memory and which data (Column 0-7) as specified by the

`ATS.Compute.Delta.FileName` command the Delta computation is to be performed on. By using this command several times to select multiple data sources, several Delta computations can be performed in one operation.

See Also `ATS.Compute.Delta.Apply`, `ATS.Compute.Delta.FileName`

Example See example for `ATS.Compute.Delta.Apply`.

ATS.Compute.Delta.DataColumn — Method

Syntax **`ATS.Compute.Delta.DataColumn(`**`ByVal` *`Data`* `As Integer)`

Data Type Integer

Parameter

Name	Description
Data	Number of the Sweep Data (1-6) of the data in memory.

Description This command returns the column in the attached file used in the Delta computation for the specified Sweep Data.

See Also `ATS.Compute.Delta.Data`, `ATS.Compute.Delta.FileName`

Example

```
Sub Main
  ATS.File.OpenTest "Delta Data Column.ats2"
  Debug.Print "Compute Delta using column #" _
     & ATS.Compute.Delta.DataColumn(1)
End Sub
```

Output

```
Compute Delta using column #1
```

ATS.Compute.Delta.FileName — Property

Syntax **`ATS.Compute.Delta.FileName`**

Data Type String — Any valid DOS filename and extension. Enter "SweepData" for the file name to select data in memory.

Description This command attaches a data file to be used in the Compute Delta computation. The difference between the selected column data values in the data file and the selected data in memory will be calculated and then replace the data in memory.

See Also `ATS.Compute.Delta.Apply`

Example See example for `ATS.Compute.Delta.Apply`.

ATS.Compute.Delta.PostSweep — Property

Syntax **`ATS.Compute.Delta.PostSweep`**

Data Type Boolean

True	Enable computation to be applyed after sweep.
False	Disable computation after sweep.

Description This command instructs the test to perform the Delta computation after a sweep is complete and sets the state of the Apply After Sweep field on the Compute Delta panel.

ATS retains the order in which the Apply After Sweep field on the Compute panels is enabled. This permits multiple computations to be performed on data from a single test. The order of the computations is also retained in the test file.

See Also `ATS.Compute.Delta.Apply`

Example See example for `ATS.Compute.Delta.Apply`.

ATS.Compute.Equalize.Apply — Method

Syntax **`ATS.Compute.Equalize.Apply`**

Result Boolean

True	Computation performed.
False	Computation NOT performed.

Description This command applies equalization to the selected data (1-6).

See Also ATS.Compute.Clear.All,
ATS.Compute.Equalize.Data,
ATS.Compute.Equalize.FileName,
ATS.Compute.Equalize.PostSweep

Example

```
Sub Main
  ATS.File.OpenTest "EQ.ATS2"
  ATS.Sweep.Start
  ATS.Compute.Equalize.FileName = "EQ1.ATSA"
  ATS.Compute.Equalize.PostSweep = False
  ATS.Compute.Equalize.Data(1,1) = True
  ATS.Compute.Equalize.Data(2,2) = True
  ATS.Compute.Equalize.Apply
End Sub
```

ATS.Compute.Equalize.Data — Property

Syntax `ATS.Compute.Equalize.Data(ByVal Source As Integer, ByVal Column As Integer)`

Data Type Boolean

True	Select specified data.
False	Deselect specified data.

Parameter

Name	Description
Source	Number of the Sweep Data (1-6) of the data in memory.
Column	Number of the Data Column (0-7) of the data specified by the ATS.Compute.Equalize.FileName command.

Description This command determines which data (Data 1-6) in memory and which data (Column 0-7) as specified by the ATS.Compute.Equalize.FileName command the Equalization computation is to be performed on. By using this command several times to select multiple data sources, several Equalization computations can be performed in one operation.

See Also ATS.Compute.Equalize.Apply,
ATS.Compute.Equalize.FileName

Example See example for `ATS.Compute.Equalize.Apply`.

ATS.Compute.Equalize.DataColumn — Method

Syntax **`ATS.Compute.Equalize.DataColumn(`**`ByVal` *`Data`* `As Integer)`

Data Type Integer

Parameter

Name	Description
`Data`	Number of the Sweep Data (1-6) of the data in memory.

Description This command returns the column in the attached file used in the Equalize computation for the specified Sweep Data.

See Also `ATS.Compute.Equalize.Data`, `ATS.Compute.Equalize.FileName`

Example

```
Sub Main
  ATS.File.OpenTest "Equalize Data Column.ats2"

Debug.Print "Compute Equalize using EQ File " _
  & ATS.Compute.Equalize.FileName
Debug.Print "Compute Equalize using column #" _
  & ATS.Compute.Equalize.DataColumn(1)
End Sub
```

Output

```
Compute Equalize using EQ File 50US-de.atsq
Compute Equalize using column #1
```

ATS.Compute.Equalize.FileName — Property

Syntax **`ATS.Compute.Equalize.FileName`**

Data Type String — Any valid DOS filename and extension. Enter "SweepData" for the file name to select data in memory.

Description This command attaches a data file (Eq) to be used in the Compute Equalize computation. The data in memory is multipled by the data in the Eq file.

See Also `ATS.Compute.Equalize.Apply`

Example See example for `ATS.Compute.Equalize.Apply`.

ATS.Compute.Equalize.PostSweep — Property

Syntax **`ATS.Compute.Equalize.PostSweep`**

Data Type Boolean

True	Enable computation to be applyed after sweep.
False	Disable computation after sweep.

Description This command instructs the test to perform equalization after a sweep is complete and sets the state of the Apply After Sweep field on the Compute Equalize panel.

ATS retains the order in which the Apply After Sweep field on the Compute panels is enabled. This permits multiple computations to be performed on data from a single test. The order of the computations is also retained in the test file.

See Also `ATS.Compute.Equalize.Apply`

Example See example for `ATS.Compute.Equalize.Apply`.

ATS.Compute.Invert.Apply — Method

Syntax **`ATS.Compute.Invert.Apply`**

Result Boolean

True	Computation performed.
False	Computation NOT performed.

Description This command applies the Invert computation to the selected data (1-6).

See Also `ATS.Compute.Clear.All, ATS.Compute.Invert.Data, ATS.Compute.Invert.Horizontal, ATS.Compute.Invert.PostSweep`

Example

```
Sub Main
  ATS.File.OpenTest "INVERT.AT2R"
  ATS.Compute.Invert.PostSweep = False
  ATS.Compute.Invert.Data(1) = True
  ATS.Compute.Invert.Horizontal("Hz") = 5000
  ATS.Sweep.Start
  ATS.Compute.Invert.Apply
End Sub
```

ATS.Compute.Invert.Data — Property

Syntax `ATS.Compute.Invert.Data(ByVal Source As Integer)`

Data Type Boolean

True	Select specified data.
False	Deselect specified data.

Parameter

Name	Description
Source	1 = Data 1 measurements 2 = Data 2 measurements 3 = Data 3 measurements 4 = Data 4 measurements 5 = Data 5 measurements 6 = Data 6 measurements

Description This command determines which data (1-6) the Invert computation is to be performed on. By using this command several times to select multiple data sources, several Invert computations can be performed in one operation.

See Also `ATS.Compute.Invert.Apply`

Example See example for `ATS.Compute.Invert.Apply`.

ATS.Compute.Invert.Horizontal — Property

Syntax `ATS.Compute.Invert.Horizontal(ByVal Unit As String)`

Data Type Double

Parameter

Name	Description
Unit	The desired unit has to be available to the sweep panel: Source 1 for X-Y plots and Data 2 for X-Y Data 2 On X plots.

Description This command sets the horizontal value in which the data will be inverted around.

See Also `ATS.Compute.Invert.Apply`

Example See example for `ATS.Compute.Invert.Apply`.

ATS.Compute.Invert.HorizontalUnit — Method

Syntax `ATS.Compute.Invert.HorizontalUnit`

Result String

Description This command returns the Unit used for the Horizontal setting for the Compute Invert function.

See Also `ATS.Compute.Invert.Horizontal`

Example

```
Sub Main
  ATS.Compute.Invert.Data(1) = True
  ATS.Compute.Invert.Horizontal("Hz") = 1000.0
  Debug.Print ATS.Compute.Invert.HorizontalUnit
End Sub
```

Output

```
Hz
```

ATS.Compute.Invert.PostSweep — Property

Syntax `ATS.Compute.Invert.PostSweep`

Data Type Boolean

True	Enable computation to be applyed after sweep.
False	Disable computation after sweep.

Description This command instructs the test to perform the Invert computation after a sweep is complete and sets the state of the Apply After Sweep field on the Compute Invert panel.

ATS retains the order in which the Apply After Sweep field on the Compute panels is enabled. This permits multiple computations to be performed on data from a single test. The order of the computations is also retained in the test file.

See Also `ATS.Compute.Invert.Apply`

Example See example for `ATS.Compute.Invert.Apply`.

ATS.Compute.Linearity.Apply — Method

Syntax **`ATS.Compute.Linearity.Apply`**

Result Boolean

True	Computation performed.
False	Computation NOT performed.

Description This command applies the Linearity computation to the selected data (1-6). The differance

See Also
`ATS.Compute.Clear.All`,
`ATS.Compute.Linearity.Data`,
`ATS.Compute.Linearity.PostSweep`,
`ATS.Compute.Linearity.Start`,
`ATS.Compute.Linearity.Stop`,

Example

```
Sub Main
  ATS.File.OpenTest "LINEAR.ATS2"
  ATS.Compute.Linearity.PostSweep = False
  ATS.Compute.Linearity.Data(1) = True
  ATS.Compute.Linearity.Start("Vrms") = .5
  ATS.Compute.Linearity.Stop("Vrms") = 2
  ATS.Sweep.Start
```

```
    ATS.Compute.Linearity.Apply
    ATS.Sweep.Data(1).Bottom("V") = -.02
    ATS.Sweep.Data(1).Top("V") = .02
End Sub
```

ATS.Compute.Linearity.Data — Property

Syntax **ATS.Compute.Linearity.Data(**ByVal *Source* As Integer**)**

Data Type Boolean

True	Select specified data.
False	Deselect specified data.

Parameter

Name	Description
Source	1 = Data 1 measurements 2 = Data 2 measurements 3 = Data 3 measurements 4 = Data 4 measurements 5 = Data 5 measurements 6 = Data 6 measurements

Description This command determines which data (1-6) the Linearity computation is to be performed on. By using this command several times to select multiple data sources, several Linearity computations can be performed in one operation.

See Also ATS.Compute.Linearity.Apply

Example See example for ATS.Compute.Linearity.Apply.

ATS.Compute.Linearity.PostSweep — Property

Syntax **ATS.Compute.Linearity.PostSweep**

Data Type Boolean

True	Enable computation to be applyed after sweep.
False	Disable computation after sweep.

Description This command instructs the test to perform the Linearity computation after a sweep is complete and sets the state of the Apply After Sweep field on the Compute Linearity panel.

ATS retains the order in which the Apply After Sweep field on the Compute panels is enabled. This permits multiple computations to be performed on data from a single test. The order of the computations is also retained in the test file.

See Also `ATS.Compute.Linearity.Apply`

Example See example for `ATS.Compute.Linearity.Apply`.

ATS.Compute.Linearity.Start — Property

Syntax **`ATS.Compute.Linearity.Start(`**`ByVal` *`Unit`* `As String`**`)`**

Data Type Double

Parameter

Name	Description
`Unit`	The desired unit has to be available to the sweep panel: Source 1 for X-Y plots and Data 2 for X-Y Data 2 On X plots.

Description This command sets the Start value of the data over which the Linearity computation will be performed.

See Also `ATS.Compute.Linearity.Stop`, `ATS.Compute.Linearity.Apply`

Example See example for `ATS.Compute.Linearity.Apply`.

ATS.Compute.Linearity.StartUnit — Method

Syntax **`ATS.Compute.Linearity.StartUnit`**

Result String

Description This command returns the Unit used for the Start setting for the Compute Linearity function.

See Also `ATS.Compute.Linearity.StopUnit`

Example

```
Sub Main
   ATS.Compute.Linearity.Data(1) = True
   ATS.Compute.Linearity.Start("Hz") = 0.02
   Debug.Print ATS.Compute.Linearity.StartUnit
End Sub
```

Output

```
Hz
```

ATS.Compute.Linearity.Stop — Property

Syntax **`ATS.Compute.Linearity.Stop(`**`ByVal` *`Unit`* `As String`**`)`**

Data Type Double

Parameter

Name	Description
Unit	The desired unit has to be available to the sweep panel: Source 1 for X-Y plots and Data 2 for X-Y Data 2 On X plots.

Description This command sets the Stop value of the data over which the Linearity computation will be performed.

See Also `ATS.Compute.Linearity.Start`, `ATS.Compute.Linearity.Apply`

Example See example for `ATS.Compute.Linearity.Apply`.

ATS.Compute.Linearity.StopUnit — Method

Syntax **`ATS.Compute.Linearity.StopUnit`**

Result String

Description This command returns the Unit used for the Stop setting for the Compute Linearity function.

See Also ATS.Compute.Linearity.StartUnit

Example
```
Sub Main
  ATS.Compute.Linearity.Data(1) = True
  ATS.Compute.Linearity.Stop("Hz") = 20000.0
  Debug.Print ATS.Compute.Linearity.StopUnit
End Sub
```

Output
```
Hz
```

ATS.Compute.Max.Apply — Method

Syntax **ATS.Compute.Max.Apply**

Result Boolean

True	Computation performed.
False	Computation NOT performed.

Description This command applies the Maximum computation to the selected data (1-6).

See Also ATS.Compute.Clear.All, ATS.Compute.Max.Data, ATS.Compute.Max.PostSweep, ATS.Compute.Max.Start, ATS.Compute.Max.Stop

Example
```
Sub Main
  ATS.File.OpenTest "MAX.ATS2"
  ATS.Compute.Max.PostSweep = False
  ATS.Compute.Max.Data(1) = True
  ATS.Compute.Max.Start("Hz") = 2000
  ATS.Compute.Max.Stop("Hz") = 200
  ATS.Sweep.Start
  ATS.Compute.Max.Apply
End Sub
```

ATS.Compute.Max.Data — Property

Syntax **ATS.Compute.Max.Data(**ByVal *Source* As Integer**)**

Data Type Boolean

True	Select specified data.
False	Deselect specified data.

Parameter	**Name**	**Description**
	Source	1 = Data 1 measurements 2 = Data 2 measurements 3 = Data 3 measurements 4 = Data 4 measurements 5 = Data 5 measurements 6 = Data 6 measurements

Description This command determines which data (1-6) the Maximum computation is to be performed on. By using this command several times to select multiple data sources, several Maximum computations can be performed in one operation.

See Also `ATS.Compute.Max.Apply`

Example See example for `ATS.Compute.Max.Apply`.

ATS.Compute.Max.PostSweep Property

Syntax **`ATS.Compute.Max.PostSweep`**

Data Type Boolean

True	Enable computation to be applyed after sweep.
False	Disable computation after sweep.

Description This command instructs the test to perform the Maximum computation after a sweep is complete and sets the state of the Apply After Sweep field on the Compute Maximum panel.

ATS retains the order in which the Apply After Sweep field on the Compute panels is enabled. This permits multiple computations to be performed on data from a single test. The order of the computations is also retained in the test file.

See Also `ATS.Compute.Max.Apply`

Example See example for `ATS.Compute.Max.Apply`.

ATS.Compute.Max.Start Property

Syntax `ATS.Compute.Max.Start(ByVal Unit As String)`

Data Type Double

Parameter

Name	Description
Unit	The desired unit has to be available to the sweep panel: Source 1 for X-Y plots and Data 2 for X-Y Data 2 On X plots.

Description This command sets the Start value of the data over which the Maximum computation will be performed.

See Also `ATS.Compute.Max.Stop, ATS.Compute.Max.Apply`

Example See example for `ATS.Compute.Max.Apply`.

ATS.Compute.Max.StartUnit Method

Syntax `ATS.Compute.Max.StartUnit`

Result String

Description This command returns the Unit used for the Start setting for the Compute Maximum function.

See Also `ATS.Compute.Max.StopUnit`

Example

```
Sub Main
   ATS.Compute.Max.Data(1) = True
   ATS.Compute.Max.Start("Hz") = 0.02
   Debug.Print ATS.Compute.Max.StartUnit
End Sub
```

Output

```
Hz
```

ATS.Compute.Max.Stop Property

Syntax `ATS.Compute.Max.Stop(ByVal Unit As String)`

Data Type Double

Parameter

Name	Description
Unit	The desired unit has to be available to the sweep panel: Source 1 for X-Y plots and Data 2 for X-Y Data 2 On X plots.

Description This command sets the Stop value of the data over which the Maximum computation will be performed.

See Also `ATS.Compute.Max.Start, ATS.Compute.Max.Apply`

Example See example for `ATS.Compute.Max.Apply`.

ATS.Compute.Max.StopUnit — Method

Syntax **`ATS.Compute.Max.StopUnit`**

Result String

Description This command returns the Unit used for the Stop setting for the Compute Maximum function.

See Also `ATS.Compute.Max.StartUnit`

Example

```
Sub Main
   ATS.Compute.Max.Data(1) = True
   ATS.Compute.Max.Stop("Hz") = 20000.0
   Debug.Print ATS.Compute.Max.StopUnit
End Sub
```

Output

```
Hz
```

ATS.Compute.Min.Apply — Method

Syntax **`ATS.Compute.Min.Apply`**

Result Boolean

True	Computation performed.
False	Computation NOT performed.

Description This command applies the Minimum computation to the selected data (1-6).

See Also `ATS.Compute.Clear.All, ATS.Compute.Min.Data, ATS.Compute.Min.PostSweep, ATS.Compute.Min.Start, ATS.Compute.Min.Stop,`

Example

```
Sub Main
  ATS.File.OpenTest "MIN.ATS2"
  ATS.Compute.Min.PostSweep = False
  ATS.Compute.Min.Data(1) = True
  ATS.Compute.Min.Start("Hz") = 10000
  ATS.Compute.Min.Stop("Hz") = 200
  ATS.Sweep.Start
  ATS.Compute.Min.Apply
End Sub
```

ATS.Compute.Min.Data — Property

Syntax **`ATS.Compute.Min.Data(`**`ByVal` *`Source`* `As Integer`**`)`**

Data Type Boolean

True	Select specified data.
False	Deselect specified data.

Parameter

Name	Description
Source	1 = Data 1 measurements 2 = Data 2 measurements 3 = Data 3 measurements 4 = Data 4 measurements 5 = Data 5 measurements 6 = Data 6 measurements

Description This command determines which data (1-6) the Minmum computation is to be performed on. By using this command several times to select multiple data sources, several Minmum computations can be performed in one operation.

See Also `ATS.Compute.Min.Apply`

Example See example for `ATS.Compute.Min.Apply`.

ATS.Compute.Min.PostSweep Property

Syntax `ATS.Compute.Min.PostSweep`

Data Type Boolean

True	Enable computation to be applyed after sweep.
False	Disable computation after sweep.

Description This command instructs the test to perform the Minimum computation after a sweep is complete and sets the state of the Apply After Sweep field on the Compute Minimum panel.

ATS retains the order in which the Apply After Sweep field on the Compute panels is enabled. This permits multiple computations to be performed on data from a single test. The order of the computations is also retained in the test file.

See Also `ATS.Compute.Min.Apply`

Example See example for `ATS.Compute.Min.Apply`.

ATS.Compute.Min.Start Property

Syntax `ATS.Compute.Min.Start(ByVal Unit As String)`

Data Type Double

Parameter

Name	Description
Unit	The desired unit has to be available to the sweep panel: Source 1 for X-Y plots and Data 2 for X-Y Data 2 On X plots.

Description This command sets the Start value of the data over which the Minimum computation will be performed.

See Also `ATS.Compute.Min.Stop, ATS.Compute.Min.Apply`

Example See example for `ATS.Compute.Min.Apply`.

ATS.Compute.Min.StartUnit — Method

Syntax `ATS.Compute.Min.StartUnit`

Result String

Description This command returns the Unit used for the Start setting for the Compute Minimum function.

See Also `ATS.Compute.Min.StopUnit`

Example

```
Sub Main
   ATS.Compute.Min.Data(1) = True
   ATS.Compute.Min.Start("Hz") = 0.02
   Debug.Print ATS.Compute.Min.StartUnit
End Sub
```

Output

```
Hz
```

ATS.Compute.Min.Stop — Property

Syntax `ATS.Compute.Min.Stop(ByVal Unit As String)`

Data Type Double

Parameter

Name	Description
Unit	The desired unit has to be available to the sweep panel: Source 1 for X-Y plots and Data 2 for X-Y Data 2 On X plots.

Description This command sets the Stop value of the data over which the Minimum computation will be performed.

See Also `ATS.Compute.Min.Start, ATS.Compute.Min.Apply`

Example See example for `ATS.Compute.Min.Apply`.

ATS.Compute.Min.StopUnit — Method

Syntax `ATS.Compute.Min.StopUnit`

Result String

Description This command returns the Unit used for the Stop setting for the Compute Minimum function.

See Also `ATS.Compute.Min.StartUnit`

Example

```
Sub Main
   ATS.Compute.Min.Data(1) = True
   ATS.Compute.Min.Stop("Hz") = 20000.0
   Debug.Print ATS.Compute.Min.StopUnit
End Sub
```

Output

```
Hz
```

ATS.Compute.Normalize.Apply — Method

Syntax **`ATS.Compute.Normalize.Apply`**

Result Boolean

True	Computation performed.
False	Computation NOT performed.

Description This command applies the Normalize computation to the selected data (1-6).

See Also `ATS.Compute.Clear.All`, `ATS.Compute.Normalize.Data`, `ATS.Compute.Normalize.Horizontal`, `ATS.Compute.Normalize.PostSweep`, `ATS.Compute.Normalize.Target`

Example

```
Sub Main
   ATS.File.OpenTest "NORMAL.ATS2"
   ATS.Compute.Normalize.PostSweep = False
   ATS.Compute.Normalize.Data(1) = True
   ATS.Compute.Normalize.Horizontal("Hz") = 1000
   ATS.Compute.Normalize.Target("dBV") = 0.0
   ATS.Sweep.Start
   ATS.Compute.Normalize.Apply
End Sub
```

ATS.Compute.Normalize.Data Property

Syntax `ATS.Compute.Normalize.Data(ByVal Source As Integer)`

Data Type Boolean

True	Select specified data.
False	Deselect specified data.

Parameter

Name	Description
Source	1 = Data 1 measurements 2 = Data 2 measurements 3 = Data 3 measurements 4 = Data 4 measurements 5 = Data 5 measurements 6 = Data 6 measurements

Description This command determines which data (1-6) the Normalize computation is to be performed on. By using this command several times to select multiple data sources, several Normalize computations can be performed in one operation.

See Also `ATS.Compute.Normalize.Apply`

Example See example for `ATS.Compute.Normalize.Apply`.

ATS.Compute.Normalize.Horizontal Property

Syntax `ATS.Compute.Normalize.Horizontal(ByVal Unit As String)`

Data Type Double

Parameter

Name	Description
Unit	The desired unit has to be available to the sweep panel: Source 1 for X-Y plots and Data 2 for X-Y Data 2 On X plots.

Description This command sets the horizontal value in which the data will be normalized around.

See Also `ATS.Compute.Normalize.Apply`, `ATS.Compute.Normalize.Target`

Example See example for `ATS.Compute.Normalize.Apply`.

ATS.Compute.Normalize.HorizontalUnit — Method

Syntax **`ATS.Compute.Normalize.HorizontalUnit`**

Result String

Description This command returns the Unit used for the Horizontal setting for the Compute Normalize function.

See Also `ATS.Compute.Normalize.Horizontal`

Example

```
Sub Main
  ATS.Compute.Normalize.Data(1) = True
  ATS.Compute.Normalize.Horizontal("Hz") = 1000.0
  Debug.Print ATS.Compute.Normalize.HorizontalUnit
End Sub
```

Output

```
Hz
```

ATS.Compute.Normalize.PostSweep — Property

Syntax **`ATS.Compute.Normalize.PostSweep`**

Data Type Boolean

True	Enable computation to be applyed after sweep.
False	Disable computation after sweep.

Description This command instructs the test to perform the Normalize computation after a sweep is complete and sets the state of the Apply After Sweep field on the Compute Normalize panel.

ATS retains the order in which the Apply After Sweep field on the Compute panels is enabled. This permits multiple computations to be performed on data from a single test. The order of the computations is also retained in the test file.

See Also `ATS.Compute.Normalize.Apply`

Example See example for `ATS.Compute.Normalize.Apply`.

ATS.Compute.Normalize.Target — Property

Syntax **`ATS.Compute.Normalize.Target(`**`ByVal` *`Unit`* `As String`**`)`**

Data Type Double

Parameter

Name	Description
`Unit`	The desired unit has to be available to the sweep panel: Source 1 for X-Y plots and Data 2 for X-Y Data 2 On X plots.

Description This command sets the vertical value in which the data will be Normalized to.

See Also `ATS.Compute.Normalize.Apply`, `ATS.Compute.Normalize.Horizontal`

Example See example for `ATS.Compute.Normalize.Apply`.

ATS.Compute.Normalize.TargetUnit — Method

Syntax **`ATS.Compute.Normalize.TargetUnit`**

Result String

Description This command returns the Unit used for the Target setting for the Compute Normalize function.

See Also `ATS.Compute.Normalize.Target`

Example

```
Sub Main
   ATS.Compute.Normalize.Data(1) = True
   ATS.Compute.Normalize.Target("V") = 1.0
   Debug.Print ATS.Compute.Normalize.TargetUnit
End Sub
```

Output V

ATS.Compute.Smooth.Apply — Method

Syntax **ATS.Compute.Smooth.Apply**

Result Boolean

True	Computation performed.
False	Computation NOT performed.

Description This command performs a running 3-point smoothing computation to the selected data (1-6).

See Also ATS.Compute.Clear.All, ATS.Compute.Smooth.Data, ATS.Compute.Smooth.Passes, ATS.Compute.Smooth.PostSweep

Example

```
Sub Main
  ATS.File.OpenTest "SMOOTH.ATS2"
  ATS.Compute.Smooth.PostSweep = False
  ATS.Compute.Smooth.Auto = False
  ATS.Compute.Smooth.Data(1) = True
  ATS.Compute.Smooth.Passes = 1
  ATS.Sweep.Start
  ATS.Compute.Smooth.Apply
End Sub
```

ATS.Compute.Smooth.Auto — Property

Syntax **ATS.Compute.Smooth.Auto**

Data Type Boolean

True	Enable auto smoothing.
False	Disable auto smoothing.

Description This command automatically determines the number of passes that the smoothing algorithm performs on the selected data based on the number of measurements in the data.

See Also `ATS.Compute.Smooth.Apply`

Example See example for `ATS.Compute.Smooth.Apply`.

ATS.Compute.Smooth.Data Property

Syntax **`ATS.Compute.Smooth.Data(`**`ByVal` *`Source`* `As Integer`**`)`**

Data Type Boolean

`True`	Select specified data.
`False`	Deselect specified data.

Parameter

Name	Description
`Source`	1 = Data 1 measurements 2 = Data 2 measurements 3 = Data 3 measurements 4 = Data 4 measurements 5 = Data 5 measurements 6 = Data 6 measurements

Description This command determines which data (1-6) the Smooth computation is to be performed on. By using this command several times to select multiple data sources, several Smooth computations can be performed in one operation.

See Also `ATS.Compute.Smooth.Apply`

Example See example for `ATS.Compute.Smooth.Apply`.

ATS.Compute.Smooth.Passes Property

Syntax **`ATS.Compute.Smooth.Passes`**

Data Type Long

Description This command sets the number of times the smoothing alogrothum is applied to the selected data.

See Also `ATS.Compute.Smooth.Apply`, `ATS.Compute.Smooth.Data`

Example See example for `ATS.Compute.Smooth.Apply`.

ATS.Compute.Smooth.PostSweep — Property

Syntax **`ATS.Compute.Smooth.PostSweep`**

Data Type Boolean

`True`	Enable computation to be applyed after sweep.
`False`	Disable computation after sweep.

Description This command instructs the test to perform the Smooth computation after a sweep is complete and sets the state of the Apply After Sweep field on the Compute Smooth panel.

ATS retains the order in which the Apply After Sweep field on the Compute panels is enabled. This permits multiple computations to be performed on data from a single test. The order of the computations is also retained in the test file.

See Also `ATS.Compute.Smooth.Apply`

Example See example for `ATS.Compute.Smooth.Apply`.

ATS.Compute.Status.Id — Method

Syntax **`ATS.Compute.Status.Id(`**`ByVal` *`Num`* `As Integer`**`)`**

Data Type Integer — Type of computation.

142	Normalize
138	Invert
144	Smooth
139	Linearity
136	Center
137	Delta
135	Average
140	Minimum
141	Maximum
151	Equalize

Parameter

Name	Description
Num	Number representing computation order.

Description This command returns the Compute Status Identification Number.

See Also `ATS.Compute.Status.NumOf`

Example

```
Sub Main
  ATS.File.OpenTest("Status Id.ats2")
  Computations = ATS.Compute.Status.NumOf
  Debug.Print  Computations & _
  " Computations performed in the following order."

  For Counter = 0 To Computations - 1
     Debug.Print ComputationText _
        (ATS.Compute.Status.Id(Counter))
  Next Counter
End Sub
Function ComputationText(IdNum)
  Select Case(IdNum)
      Case 142
        ComputationText = "Normalize"
      Case 138
        ComputationText = "Invert"
      Case 144
        ComputationText = "Smooth"
      Case 139
        ComputationText = "Linearity"
      Case 136
        ComputationText = "Center"
      Case 137
        ComputationText = "Delta"
      Case 135
        ComputationText = "Average"
      Case 140
        ComputationText = "Minimum"
      Case 141
        ComputationText = "Maximum"
      Case 151
        ComputationText = "Equalize"
```

```
  End Select
End Function
```

Output

```
10 Computations performed in the following order
Normalize
Invert
Smooth
Linearity
Center
Delta
Average
Minimum
Maximum
Equalize
```

ATS.Compute.Status.NumOf Method

Syntax **`ATS.Compute.Status.NumOf`**

Data Type Integer

Description This command returns the number of computations applied to the Sweep Data after the sweep has completed.

See Also `ATS.Compute.Status.Id`

Example See example for `ATS.Compute.Status.Id`.

Chapter 8

Data

ATS.Data.AddRowToEnd — Method

Syntax **ATS.Data.AddRowToEnd(**ByVal *Id* As Integer**)**

Parameter

Name	Description
Id	Data identification number. Use an Id# of zero (0) to access sweep data. Refer to ATS.Data.Id command for additional information.

Result Integer

Description This command adds an additional row to the end of data and returns the number of the row added.

Example

```
Sub Main
   ATS.Application.NewTest
   ATS2.Inst.Analyzer.FuncMode = apbAnlrPhase
   ATS.Sweep.Data(2).Id = 5905  'Add Phase to Sweep
   StartValue = 20
   StopValue = 20000
   Frequencies = 31

   Counter = StartValue
   Do
      intAddRowToEnd = ATS.Data.AddRowToEnd(0)
      ATS.Data.Value(0,0,intAddRowToEnd,"Hz") = _
         Counter
      ATS.Data.Value(0,1,intAddRowToEnd,"V") = 1.0
      ATS.Data.Value(0,2,intAddRowToEnd,"deg") = 0.0
      Counter = Counter * 1.25893
   Loop Until Counter > StopValue

   intAddRowToEnd = ATS.Data.AddRowToEnd(0)
   ATS.Data.Value(0,0,intAddRowToEnd,"Hz") = StopValue
```

```
   ATS.Data.Value(0,1,intAddRowToEnd,"V") = 1.0
   ATS.Data.Value(0,2,intAddRowToEnd,"deg") = 0.0
   ATS.Data.UpdateDisplay(0)
End Sub
```

ATS.Data.ColLimitError — Method

Syntax

ATS.Data.ColLimitError(ByVal *Id* As Integer, ByVal *Column* As Integer**)**

Parameter

Name	Description
Id	Data identification number. Use an Id# of zero (0) to access sweep data. Refer to `ATS.Data.Id` command for additional information.
Column	Number of the Data Column (0-7).

Result

Integer

Description

This command returns a positive value if any measurement exceeds the upper or lower limit values for the specified column of data. A zero is returned if no errors occur. The returned value defines the number of measurements that exceed a limit.

See Also

`ATS.Data.LimitError`

Example

```
Sub Main
   ATS.File.OpenTest("FREQ.ATS2")
   ATS.Sweep.Start
   Errors = ATS.Data.ColLimitError(0,1)
   If Errors > 0 Then
      ErrorsUpper = ATS.Data.ColUpperLimitError(0,1)
      ErrorsLower = ATS.Data.ColLowerLimitError(0,1)
      String1$ = "This test Failed. " & Str(Errors) _
         & " Errors."
      String2$ = Str(ErrorsUpper) & " Upper Limit _
         Errors."
      String3$ = Str(ErrorsLower) & " Lower Limit
      Errors."
      Prompt.Text = String1$ & Chr(13) & String2$ & _
         Chr(13) & String3$
      ATS.Prompt.FontSize = 18
```

```
      ATS.Prompt.Position -1,-1,425,175
      ATS.Prompt.ShowWithContinue
      Stop
   ElseIf Errors = 0 Then
      ATS.Prompt.Text = "This test Passed."
      ATS.Prompt.FontSize = 18
      ATS.Prompt.Position -1,-1,290,100
      ATS.Prompt.ShowWithContinue
      Stop
   End If
End Sub
```

ATS.Data.ColLowerLimitError — Method

Syntax **ATS.Data.ColLowerLimitError(**ByVal *Id* As Integer, ByVal *Column* As Integer**)**

Parameter

Name	Description
Id	Data identification number. Use an Id# of zero (0) to access sweep data. Refer to ATS.Data.Id command for additional information.
Column	Number of the Data Column (0-7).

Result Integer

Description This command returns the number of lower limit errors for the selected data. A zero is returned if no errors occur.

Example See example for ATS.Data.ColLimitError.

ATS.Data.ColName — Method

Syntax **ATS.Data.ColName(**ByVal *Id* As Integer, ByVal *Column* As Integer**)**

Parameter

Name	Description
Id	Data identification number. Use an Id# of zero (0) to access sweep data. Refer to ATS.Data.Id command for additional information.

	Column	Number of the Data Column (0-7).

Result String

Description This command returns the string as shown on the sweep panel for the selected data. The string defines the meter that is returning measurements.

Example

```
Sub Main
   ATS.Application.NewTest
   ATS.Sweep.Start
   ColumnName$ = ATS.Data.ColName(0,1)
   Debug.Print "String definition For Data 1: = " & _
   ColumnName$
End Sub
```

Comment This macro puts up a prompt displaying the contents of the Data 1 control on the Sweep Panel.

Output

```
String definition For Data 1: = .Analyzer.Level A
```

ATS.Data.ColNumOf — Method

Syntax **ATS.Data.ColNumOf(**ByVal *Id* As Integer**)**

Parameter	Name	Description
	Id	Data identification number. Use an Id# of zero (0) to access sweep data. Refer to `ATS.Data.Id` command for additional information.

Result Integer

Description This command returns the number of columns of data.

Example See example for `ATS.Data.ColSize`.

ATS.Data.ColSize — Method

Syntax **ATS.Data.ColSize(**ByVal *Id* As Integer, ByVal *Column* As Integer**)**

Parameter	Name	Description
	Id	Data identification number. Use an Id# of zero (0) to access sweep data. Refer to `ATS.Data.Id` command for additional information.
	Column	Number of the Data Column (0-7).

Result Long

Description This command returns the number of rows in the specified column.

Example

```
Sub Main
   ATS.Application.NewTest
   ATS2.AGen.OutputOn = True
   ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
   ATS.Sweep.Start
   NumColumns = ATS.Data.ColNumOf(0)
   For Column = 1 To (NumColumns - 1) Step 1
      Size = ATS.Data.ColSize(0, Column)
      Debug.Print "Number of measurements for Column _
         " & Column & " = " & Size
   Next Column
End Sub
```

Output

```
Number of measurements for Column 1 = 31
```

ATS.Data.ColUnit — Property

Syntax **`ATS.Data.ColUnit(`**`ByVal` *`Id`* `As Integer, ByVal` *`Column`* `As Integer`**`)`**

Parameter	Name	Description
	Id	Data identification number. Use an Id# of zero (0) to access sweep data. Refer to `ATS.Data.Id` command for additional information.
	Column	Number of the Data Column (0-7).

Result String

Description This command returns the unit string for the data in the selected column. ATS computes all other relevant units for display.

Example

```
Sub Main
```

```
  ATS.Application.NewTest
  ATS2.AGen.OutputOn = True 'Turn Generator output ON
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS.Sweep.SinglePoint = True
  ATS.Sweep.Start
  UnitString = ATS.Data.ColUnit(0, 1)
  Debug.Print "The Unit for Data 1 is " & UnitString
End Sub
```

ATS.Data.ColUpperLimitError — Method

Syntax `ATS.Data.ColUpperLimitError(ByVal Id As Integer, ByVal Column As Integer)`

Parameter

Name	Description
Id	Data identification number. Use an Id# of zero (0) to access sweep data. Refer to `ATS.Data.Id` command for additional information.
Column	Number of the Data Column (0-7).

Result Integer

Description This command returns the number of upper limit errors for the selected data column.

Example See example for `ATS.Data.ColLimitError`.

ATS.Data.DeleteRow — Method

Syntax `ATS.Data.DeleteRow(ByVal Id As Integer, ByVal RowNum As Integer)`

Parameter

Name	Description
Id	Data identification number. Use an Id# of zero (0) to access sweep data. Refer to `ATS.Data.Id` command for additional information.
RowNum	Number of row to delete.

Result Boolean

True	Row deleted.

False	Row not deleted.

Description This command deletes the designated row.

Note that the row numbering begins with zero.

Example

```
Sub Main()
  Dim FreqData() As Double

  Size = ATS.Data.ColSize(0,0)
  ReDim FreqData(Size)
  FreqData = ATS.Data.Transfer(0,0, 0, Size - 1,"Hz")

  For Count1 = 0 To Size - 1
     LastDup = 0
     For Count2 = Count1 + 1 To Size - 1
        If FreqData(Count1) = FreqData(Count2) _
           And Count1 <> Count2 Then
           FreqData(Count2) = 0
           LastDup = Count2
           Data.Value(0,0,Count2,"Hz") = 0
        End If
     Next Count2
     If LastDup <> 0 Then Count1 = LastDup
  Next Count1

  Duplicates = 0
  For Count1 = Size - 1 To 0 Step -1
     If ATS.Data.Value(0,0,Count1,"Hz") = 0 Then
        ATS.Data.DeleteRow (0, count1)
        Duplicates = Duplicates + 1
     End If
  Next Count1
  If Duplicates > 0 Then
     ATS.Prompt.Text = Str$(Duplicates) & _
        " Duplicate frequency(s) removed."
     ATS.Prompt.Show
     Wait 2
     ATS.Prompt.Hide.
  End If
End Sub
```

ATS.Data.InsertRowAfter Method

Syntax `ATS.Data.InsertRowAfter(ByVal Id As Integer, ByVal RowNum As Integer)`

Parameter

Name	Description
Id	Data identification number. Use an Id# of zero (0) to access sweep data. Refer to `ATS.Data.Id` command for additional information.
RowNum	Number of row to insert after.

Result Boolean

True	Row inserted.
False	Row not inserted.

Description This command inserts an additional row before the designated row.

Note that the row numbering begins with zero.

Example See example for `ATS.Data.InsertRowBefore`.

ATS.Data.InsertRowBefore Method

Syntax `ATS.Data.InsertRowBefore(ByVal Id As Integer, ByVal RowNum As Integer)`

Parameter

Name	Description
Id	Data identification number. Use an Id# of zero (0) to access sweep data. Refer to `ATS.Data.Id` command for additional information.
RowNum	Number of row to insert before.

Result Boolean

True	Row deleted.
False	Row not deleted.

Description This command inserts an additional row after the designated row.

Note that the row numbering begins with zero.

Example See example for `ATS.Data.InsertRowAfter`.

ATS.Data.LimitError Method

Syntax `ATS.Data.LimitError(ByVal Id As Integer)`

Parameter

Name	Description
Id	Data identification number. Use an Id# of zero (0) to access sweep data. Refer to `ATS.Data.Id` command for additional information.

Result Integer

Description This command returns the number of measurements that exceed a limit.

Example

```
Sub Main
  ATS.File.OpenTest "S2-FREQ.ATS2"
  ATS.Sweep.Start
  Errors = ATS.Data.LimitError(0)
  If Errors > 0 Then
     ErrorsUpper = ATS.Data.ColUpperLimitError(0,1)
     ErrorsLower = ATS.Data.ColLowerLimitError(0,1)
     String1$ = "This test Failed. " & Str(Errors) _
        & " Errors. "
     String2$ = Str(ErrorsUpper) & " Upper Limit _
        Errors."
     String3$ = Str(ErrorsLower) & " Lower Limit _
        Errors."
     ATS.Prompt.Text = String1$ & vbCr & String2$ & _
        vbCr & String3$
     ATS.Prompt.FontSize = 18
     ATS.Prompt.Position -1,-1,425,175
     ATS.Prompt.ShowWithContinue
     Stop
  ElseIf Errors = 0 Then
     ATS.Prompt.Text = "This test Passed."
     ATS.Prompt.FontSize = 18
     ATS.Prompt.Position -1,-1,290,100
     ATS.Prompt.ShowWithContinue
     Stop
  End If
End Sub
```

ATS.Data.LowerLimitError Method

Syntax `ATS.Data.LowerLimitError(ByVal Id As Integer)`

Parameter

Name	Description
Id	Data identification number. Use an Id# of zero (0) to access sweep data. Refer to `ATS.Data.Id` command for additional information.

Result Integer

Description This command returns a positive value if any measurement is less than the lower limit values. A zero is returned if no errors occur. The returned value defines the number of measurements that are less than the limit.

Example

```
Sub Main
  ATS.File.OpenTest "FREQ.ATS2"
  ATS.Sweep.Start
  Flag = ATS.Data.LowerLimitError(0)
  If Flag > 0 Then
     ATS.Prompt.Text = "This test Failed."
     ATS.Prompt.FontSize = 18
     ATS.Prompt.Position -1,-1,290,100
     ATS.Prompt.ShowWithContinue
     Stop
  ElseIf Flag = 0 Then
     ATS.Prompt.Text = "This test Passed."
     ATS.Prompt.FontSize = 16
     ATS.Prompt.Position -1,-1,290,100
     ATS.Prompt.ShowWithContinue
     Stop
  End If
End Sub
```

ATS.Data.Status Property

Syntax `ATS.Data.Status(ByVal Id As Integer, ByVal Column As Integer, ByVal Index As Long, ByVal Status As Constant)`

Data Type Boolean

True	Data value status as specified by Status constant.
False	Data value status valid.

Parameter

Name	Description
Id	Data identification number. Use an Id# of zero (0) to access sweep data. Refer to `ATS.Data.Id` command for additional information.
Column	Number of the Data Column (0-7).
Index	This value defines which row a measurement is returned from. A column may have any number of rows. Use the `ATS.Data.ColSize` command to determine the number of rows in a column. Note that the row numbering begins with zero.
Status	apbInValid = Data displayed as Invalid. apbTimeout = Data displayed as Timed out. apbUnregulated = Data displayed as Unregulated.

Description This command set or returns the status of the specified data value.

Example

```
Sub Main
   Dim Timeouts As Integer
   Timeouts = 0
   ATS.File.OpenTest("Timeouts.ats2")
   For Row = 0 To (ATS.Data.ColSize(0, 1) - 1) Step 1
      Timeout = ATS.Data.Status(0, 1, Row, apbTimeout)
      If Timeout = True Then Timeouts = Timeouts + 1
   Next Row
   Debug.Print Timeouts & " timeouts detected."
End Sub
```

Output

```
2 timeouts detected.
```

ATS.Data.Transfer Property

Syntax

```
ATS.Data.ArrayTransfer(ByVal Id As Integer,
ByVal Column As Integer, ByVal StartIndex As
Long, ByVal StopIndex As Long, ByVal Unit As
String)
```

Data Type Variant

Parameter

Name	Description
Id	Data identification number. Use an Id# of zero (0) to access sweep data. Refer to `ATS.Data.Id` command for additional information.
Column	Number of the Data Column (0-7).
StartIndex	Starting row numbe.
StopIndex	Ending row number.
Unit	Refer to the setting or reading defined by the *column%* parameter to determine the appropriate unit selections.

Description This command transfers data to or from an array from memory. The order that data is placed into the array is defined by the *StartIndex* and *StopIndex*. Reversing the start and stop values will reverse the data taken from or placed into memory

See Also `ATS.Data.Id`

Example

```
Sub Main
  Dim A As Variant
  ATS.Application.NewTest
  ATS2.AGen.OutputOn = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS2.Inst.Analyzer.FuncFilterLP = apbAnlrLP15k
  ATS.Sweep.Data(1).Id = 6343
  ATS.Sweep.Source(1).Start("Hz") = 100000
  ATS.Sweep.Source(1).Steps = 4
  ATS.Application.NewData
  ATS.Sweep.Start
  Size = ATS.Data.ColSize (0, 1) - 1
  A = ATS.Data.Transfer(0, 1, 0, 5, "V")
  For Counter = 0 To (Size - 1) Step 1
     Debug.Print "Reading" & Counter;" = " & _
        Format(A(Counter), "#.0000") & " V"
  Next Counter
End Sub
```

Comment The values in the Output are taken from the array and then displayed.

Output

```
Reading 0 = .0223 V
```

```
Reading 1 = .9889 V
Reading 2 = .9953 V
Reading 3 = .9945 V
Reading4 = .9931 V
```

ATS.Data.UpdateDisplay — Method

Syntax `ATS.Data.UpdateDisplay(ByVal Id As Integer)`

Parameter

Name	Description
Id	Data identification number. Use an Id# of zero (0) to access sweep data only.

Description This command updates the data displayed in the table and graph displays.

Example

```
Sub Main
  Dim A As Variant
  ATS.Application.NewTest
  ATS2.AGen.OutputOn = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS2.Inst.Analyzer.FuncFilterLP = apbAnlrLP15k
  ATS.Sweep.Data(1).Id = 6343
  ATS.Sweep.Data(3).Id = 6343
  ATS.Sweep.Source(1).Start("Hz") = 30000
  ATS.Sweep.Source(1).Steps = 4
  ATS.Sweep.Start
  Size = ATS.Data.ColSize(0, 2) - 1
  A = ATS.Data.Transfer(0, 2, 0, Size, "V")

  For Reading = 0 To Size
     Debug.Print "Acquired Reading" & Reading & _
        " = " & Format(A(Reading), "#.0000") & " V"
     A(Reading) = A(Reading) * 1.20
     Debug.Print "Changed Reading" & Reading & _
        " = " & Format(A(Reading), "#.0000") & " V"
  Next Reading
  ATS.Data.UpdateDisplay(0)
End Sub
```

Output

```
Acquired Reading 0 = .0219 V
```

```
Acquired Reading 1 = .9874 V
Acquired Reading 2 = .9937 V
Acquired Reading 3 = .9933 V
Acquired Reading 4 = .9950 V
Changed Reading 0 = .0262 V
Changed Reading 1 = 1.1848 V
Changed Reading 2 = 1.1925 V
Changed Reading 3 = 1.1920 V
Changed Reading 4 = 1.1940 V
```

ATS.Data.UpperLimitError — Method

Syntax **ATS.Data.UpperLimitError(**ByVal *Id* As Integer**)**

Parameter

Name	Description
Id	Data identification number. Use an Id# of zero (0) to access sweep data. Refer to `ATS.Data.Id` command for additional information.

Result Integer

Description This command returns a positive value if any measurement exceeds the upper limit values. A zero is returned if no errors occur. The returned value defines the number of measurements that exceed the limit.

Example

```
Sub Main
  ATS.File.OpenTest "FREQ.ATS2"
  ATS.Sweep.Start
  Flag = ATS.Data.UpperLimitError(0)
  If Flag > 0 Then
     ATS.Prompt.Text = "This test Failed."
     ATS.Prompt.FontSize = 18
     ATS.Prompt.Position -1,-1,290,100
     ATS.Prompt.ShowWithContinue
     Stop
  ElseIf Flag = 0 Then
     ATS.Prompt.Text = "This test Passed."
     ATS.Prompt.FontSize = 18
     ATS.Prompt.Position -1,-1,290,100
     ATS.Prompt.ShowWithContinue
```

```
    Stop
  End If
End Sub
```

ATS.Data.Value Property

Syntax **ATS.Data.Value(**ByVal *Id* As Integer, ByVal *Column* As Integer, ByVal *Index* As Long, ByVal *Unit* As String**)**

Data Type Double

Parameter

Name	Description
Id	Data identification number. Use an Id# of zero (0) to access sweep data. Refer to ATS.Data.Id command for additional information.
Column	Number of the Data Column (0-7).
Index	This value defines which row a measurement is returned from. A column may have any number of rows. Use the ATS.Data.ColSize command to determine the number of rows in a column. Note that the row numbering begins with zero.
Unit	Refer to the setting or reading defined by the *column%* parameter to determine the appropriate unit selections.

Description This command returns the specified reading from sweep data.

See Also ATS.Data.ColSize, ATS.Data.Id

Example

```
Sub Main
  ATS.Application.NewTest
  ATS2.AGen.OutputOn = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS.Sweep.SinglePoint = True
  ATS.Sweep.Start
  Reading1 = ATS.Data.Value(0, 1, 0, "V")
  Debug.Print "Reading = " & Format(Reading1, _
     "#.0000") & "V"
End Sub
```

Output

```
Reading = .9850 V
```

Chapter 9

Events

ATSEvent_OnApplicationStartup — Event

Syntax `ATSEvent_OnApplicationStartup()`

Description This event is useful when programming with Visual Basic. The event is called at the completion of the startup process of the ATS application.

ATSEvent_OnAuxDigIOInput — Event

Syntax `ATSEvent_OnAuxDigIOInput(ByVal Val As Long)`

Description This event is called each time the system reads a change of state at the Auxiliary Digital Input.

ATSEvent_OnAuxSetting — Event

Syntax `ATSEvent_OnAuxSetting(ByVal Id As Long, ByVal Value As Variant)`

Parameter

Name	Description
Id	Setting identification 1 through 4.
Value	Sweep source or settings bargraph control current value.

Description This event is called when a sweep source or settings bargraph control changes which inturn generates this event, for example, the Instrument parameter "Aux.Setting 1 (Double)" used as the Sweep panel source or Bargraph browser ID. Events are generated as the sweep runs or as the user manipulates the settings bargraph control.

Example

```
Public Halt As Boolean
Sub Main
  Halt = False

  ATS.Application.NewTest
  ATS2.AGen.ChBTrackA = False
  ATS2.AGen.OutputOn = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS2.AnalogIn.Source(apbChB) = apbAnalogInGenMon

  BarId = ATS.BarGraph.New(6271)
  'Aux.Setting 1 (Double)
  ATS.BarGraph.AxisLeft(BarId,"") = 0.0
  ATS.BarGraph.AxisRight(BarId,"") = 2.0
  ATS.BarGraph.AxisIncrement(BarId,"") = 0.1

  BarId = ATS.BarGraph.New(6275)
'Aux.Reading 1 (Double)
  ATS.BarGraph.AxisLeft(BarId,"") = 0.2
  ATS.BarGraph.AxisRight(BarId,"") = 4.0

  ATS.Aux.Setting(1) = 1.0
  ATS.Application.SetWatchDogTimer(1, 5.0, False)

  Do
  Loop While Halt = False

End Sub
Public Sub ATSEvent_OnAuxSetting(ByVal auxnum As
Long, ByVal Value As Double)
  if auxnum = 1 then
     ATS2.AGen.Ampl(apbChA, "Vrms") = Value - .2
     ATS2.AGen.Ampl(apbChB, "Vrms") = Value + .2
     ATS.Aux.Reading1Settling(auxnum, 3.0, 0.0, 1, _
        0.0, apbNone)
     ATS.Aux.ReadingTrig(auxnum)
     ReadyCount = ATS.Aux.ReadingReady(auxnum)
     ATS.Aux.SetReading(auxnum)
  ATS2.AGen.Ampl(apbChA, "Vrms") + _
        ATS2.AGen.Ampl(apbChB, "Vrms")
```

```
      ReadyCount = ATS.Aux.ReadingReady(auxnum)
   End If
End Sub
Public Sub ATSEvent_OnWatchDogTimeout(ByVal Id As _
   Long)
   If Id = 1 Then
      Halt = True
   End If
End Sub
```

ATSEvent_OnDcxProgramControlInput Event

Syntax **ATSEvent_OnDcxProgramControlInput(**ByVal *Value* As Long**)**

Parameter

Name	Description
Value	The value returned is the pin number of the DCX-127 Program Control Input connector pin that is pulled low. A zero (0) is returned if more than one button is pressed at a time.

Description This event is called when one of the DCX-127 Program Control Input pins (1) is momentarily shorted to ground (Pin 9).

Example

```
Dim Halt As Boolean
Sub Main
   Halt = False
   Do
   Loop While Halt = False
End Sub
Sub ATSEvent_OnDcxProgramControlInput(ByVal Value As
Long)
   Debug.Print "Program Control = " & Value
   If Value = 0 Then Debug.Print "More than one button
_
      pressed."
   If Value = 8 Then Halt = True
End Sub
```

ATSEvent_OnError

Event

Syntax **ATSEvent_OnError(**ByVal *Value* As Long**)**

Parameter

Name	Description
Value	Error value as defined in Appendix D Error Codes

Description This event is called when an Error is encountered.

Example

```
Sub Main
  ATS2.AGen.Ampl(apbChA, "Vrms") = 111.9
'Cause an error _
     and see what happens.
End Sub
Sub ATSEvent_OnError(ByVal ErrorCode As Long)
  Debug.Print "Got number " & Code & " " & _
     ATS.Application.GetCurrentErrorString

  ' If you are going to handle the error, then call
  ' ATS.Application.ClearCurrentError before you exit

  ' this subroutine to stop ATS from displaying the
  ' error,

  ATS.Application.ClearCurrentError

  ' It is also preferable to call
  ' ATS.Application.ClearCurrentError before you
  ' make any other calls into ATS in case these
  ' calls also generate an unexpected error
End Sub
```

ATSEvent_OnPromptContinue

Event

Syntax **ATSEvent_OnPromptContinue()**

Description Useful when programming in Visual Basic to implement "show prompt with continue." Can be used in AP Basic scripts as well. This event is called when the user presses the "Continue Macro" button

shown on a prompt when the ATS.Prompt.ShowWithContinue command is used to display a prompt.

ATSEvent_OnSweepEnd Event

Syntax **ATSEvent_OnSweepEnd**

Description This event is called when the sweep has terminated and the initial source value has been restored.

Example

```
Sub Main
  ATS.Sweep.SinglePoint = True
  ATS.Sweep.Start
End Sub
Sub ATSEvent_OnSweepStart()
  Debug.Print "Sweep Start"
End Sub
Sub ATSEvent_OnSweepNestStart(ByVal Source As Long)
Debug.Print "Sweep Nest Start "
End Sub
Sub ATSEvent_OnSweepStep(ByVal Value As Variant, _
  Source As Long)
  Debug.Print "Sweep Step = " & Value
End Sub
Sub ATSEvent_OnSweepTrigger()
  Debug.Print "Sweep Trigger"
End Sub
Sub ATSEvent_OnSweepStepEnd()
  Debug.Print "Sweep Step End"
End Sub
Sub ATSEvent_OnSweepNestEnd()
  Debug.Print "Sweep Nest End"
End Sub
Sub ATSEvent_OnSweepEnd()
  Debug.Print "Sweep End"
End Sub
```

Output

```
Sweep Start
Sweep Nest Start
Sweep Step = 20000
```

```
Sweep Trigger
Sweep Step End
Sweep Nest End
Sweep Step = 1000
Sweep End #
```

ATSEvent_OnSweepNestEnd Event

Syntax **ATSEvent_OnSweepNestEnd**

Description This event is called after a single sweep is compleated.

Example See example for ATSEvent_OnSweepEnd.

ATSEvent_OnSweepNestStart Event

Syntax **ATSEvent_OnSweepNestStart(***ByVal Source* As Long**)**

Parameter

Name	Description
Source	Sweep panel Source 1 Step value.

Description This event is called before the first step of a sweep.

Example See example for ATSEvent_OnSweepEnd.

ATSEvent_OnSweepStart Event

Syntax **ATSEvent_OnSweepStart**

Description This event is called at the start of a sweep. It prepares for the rest of the upcoming sweep by storing the initial sweep value and pre-calculating steps.

See Also ATSEvent_OnSweepEnd

Example See example for ATSEvent_OnSweepEnd.

ATSEvent_OnSweepStep Event

Syntax **ATSEvent_OnSweepStep(**ByVal *Value* As Variant, ByVal *Source* as Long**)**

Parameter

Name	Description
Value	Setting value.
Source	Indicates Source 1 or Source 2 settings (1 or 2 only).

Description This event is called after the setting for this sweep has been done.

Example See example for ATSEvent_OnSweepEnd.

ATSEvent_OnSweepStepEnd Event

Syntax **ATSEvent_OnSweepStepEnd**

Description This event is called after a reading cycle has completed. The reading cycle may return up to six settled measurements.

Example See example for ATSEvent_OnSweepEnd.

ATSEvent_OnSweepTrigger Event

Syntax **ATSEvent_OnSweepTrigger**

Description This event is after a new step value is sent, to trigger a new reading cycle.

Example See example for ATSEvent_OnSweepEnd.

ATSEvent_OnTestLoad Event

Syntax **ATSEvent_OnTestLoad()**

Description This event is called at the completion of a test loading operation.

ATSEvent_OnWatchDogTimeout Event

Syntax **ATSEvent_OnWatchDogTimeout(**ByVal *Id* As Long**)**

Parameter

Name	Description
Id	Timer identification 1 or 2.

Description This event is called when one of the two WatchDog Timers has expired.

Example

```
Dim Halt As Boolean
Sub Main
  Halt = False
  ATS.Application.NewTest
  ATS2.AGen.Output = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS.Sweep.Source(1).Steps = 30
  ATS.Application.SetWatchDogTimer(1, 5.0, False)
  ATS.Sweep.StartNoWait
  Do
  Loop While Halt = False
End Sub
Sub ATSEvent_OnWatchDogTimeout(ByVal Id As Long)
  If Id = 1 Then
     Halt = True
     If ATS.Sweep.IsRunning = True Then
        ATS.Sweep.Stop
        Debug.Print "Sweep Stopped"
     End If
  End If
End Sub
```

Chapter 10

File

ATS.File.AppendData — Method

Syntax `ATS.File.AppendData(ByVal FileName As String)`

Parameter	**Name**	**Description**
	FileName	Long Path and File Names permitted up to 128 characters.

Result Boolean

True	File Data Append successful.
False	File Data Append failed.

Description This command appends data from the designated data file into memory. This comand will only load data from a data file that has identical Sweep panel Data 1-6 and Source 1-2 instrument parameters.

ATS.File.ExportASCIIData — Method

Syntax `ATS.File.ExportASCIIData(ByVal FileName As String)`

Parameter	**Name**	**Description**
	FileName	Long Path and File Names permitted up to 128 characters.

Result Boolean

True	File export successful.
False	File export failed.

Description This command saves the measurement data in memory to a coma delimited ASCII text file.

See Also `ATS.File.ImportASCIIData`

Example

```
Sub Main
  ATS.Application.NewTest
  ATS.File.ImportASCIIData("TEMP.ATSX")
  ATS.Application.PanelOpen(apbGraph)
  ATS.Sweep.Data(1).LogLin = 1
  ATS.Graph.OptimizeLeft
  If ATS.Sweep.Data(1).Id <> 5049 Then _
     ATS.Compute.Smooth.Data(1) = True
  If ATS.Sweep.Data(2).Id <> 5049 Then _
     ATS.Compute.Smooth.Data(2) = True
  If ATS.Sweep.Data(3).Id <> 5049 Then _
     ATS.Compute.Smooth.Data(3) = True
  If ATS.Sweep.Data(4).Id <> 5049 Then _
     ATS.Compute.Smooth.Data(4) = True
  If ATS.Sweep.Data(5).Id <> 5049 Then _
     ATS.Compute.Smooth.Data(5) = True
  If ATS.Sweep.Data(6).Id <> 5049 Then _
     ATS.Compute.Smooth.Data(6) = True
  ATS.Compute.Smooth.Auto = True
  ATS.Compute.Smooth.Apply
  ATS.File.ExportASCIIData("TEMP.ATSX")
End Sub
```

ATS.File.ExportGraphic — Method

Syntax **ATS.File.ExportGraphic(**ByVal *FileName* As String, ByVal *Type* As Integer**)**

Parameter

Name	Description
FileName	Long Path and File Names permitted up to 128 characters.
Type	0 = Windows Meta File (.WMF). 1 = Windows Extended Meta File (.EMF).

Result Boolean

True	File export successful.
False	File export failed.

Description This command saves the current graph measurement data in memory to the designated file.

Example

```
Sub Main
  On Error Resume Next
  ChDir MacroDir
  ATS.Application.NewTest
  ATS2.AGen.OutputOn = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS2.Inst.Analyzer.FuncFilterLP = apbAnlrLP15k
  ATS2.Inst.Analyzer.FuncFilterHP = apbAnlrHP400
  ATS.Sweep.Data(1).Id = 6343
  ATS.Sweep.Source(1).Start("Hz") = 30000
  ATS.Sweep.Start
  Kill "GRAPH.EMF"
  blnExport = ATS.File.ExportGraphic _
     ("GRAPH.EMF", 1)
  If blnExport = False Then End
  Dim MSWord As Object
  Set MSWord = CreateObject("Word.Basic")
  MSWord.AppShow
  MSWord.FileOpen Name:= MacroDir & "\GENERIC.DOC"
  MSWord.EditFind "Graph"
  MSWord.InsertPicture MacroDir & "\GRAPH.EMF"
  MSWord.FilePrint
  Wait 10
  MSWord.FileCloseAll 2
  MSWord.AppClose
End Sub
```

ATS.File.ImportASCIIData — Method

Syntax

ATS.File.ImportASCIIData(ByVal *FileName* As String**)**

Parameter

Name	Description
FileName	Long Path and File Names permitted up to 128 characters.

Result

Boolean

True	File import successful.
False	File import failed.

Description This command loads into memory the designated ASCII data file. This comand only loads files that have been exported from ATS or conform to the ATS ASCII data file format.

See Also `ATS.File.ExportASCIIData`

Example See example for `ATS.File.ExportASCIIData`.

ATS.File.ImportTest Method

Syntax `ATS.File.ImportTest(ByVal FileName As String)`

Parameter

Name	Description
FileName	Long Path and File Names permitted up to 128 characters. File (.at2c) must be from APWIN version 2.2x.

Result Boolean

True	File import successful.
False	File import failed.

Description This command loads into memory the designated System Two Cascade test file. This comand only loads files that have been saved from APWIN versions 2.2x.

ATS.File.OpenData Method

Syntax `ATS.File.OpenData(ByVal FileName As String)`

Parameter

Name	Description
FileName	Long Path and File Names permitted up to 128 characters.

Result Boolean

True	File open successful.
False	File open failed.

Description This command loads the designated data file.

Example

```
Sub Main
  OpenResult = ATS.File.OpenTest("FRQ-RESP.ATS2")
  If OpenResult = False Then Call Open_Failed
```

```
  OpenResult = ATS.File.OpenData("FRQ-RESP.ATSA")
  If OpenResult = False Then Call Open_Failed
  ATS.Data.UpdateDisplay(0)
  Wait 5
  OpenResult = ATS.File.OpenTest("THD-FRQ.ATS2")
  If OpenResult = False Then Call Open_Failed
  OpenResult = ATS.File.OpenData("THD-FRQ.ATSA")
  If OpenResult = False Then Call Open_Failed
  ATS.Data.UpdateDisplay(0)
  Wait 5
  OpenResult = ATS.File.OpenTest("RESIDNOI.ATS2")
  If OpenResult = False Then Call Open_Failed
  OpenResult = ATS.File.OpenData("RESIDNOI.ATSA")
  If OpenResult = False Then Call Open_Failed
  ATS.Data.UpdateDisplay(0)
  Wait 5
End Sub

Sub Open_Failed
  Debug.Print"File Open FAILED."
  End
End Sub
```

ATS.File.OpenMacro — Method

Syntax **ATS.File.OpenMacro(**ByVal *FileName* As String**)**

Parameter

Name	Description
FileName	Long Path and File Names permitted up to 128 characters.

Result Boolean

True	Not applicable.
False	File open failed.

Description This command loads the designated file into the macro editor and automatically runs the macro.

Example

```
Private Sub Form_Load()
  Dim ATS As Object
  Set ATS = CreateObject("ATS.Application")
```

```
    ATS.Application.Visible = True
    ATS.File.OpenMacro "C:\BUSY.ATSB"
    While ATS.Macro.IsRunning = True
    Wend
    ChDir ATS.Application.MacroDir
    ATS.Application.Quit
End Sub
```

ATS.File.OpenTest — Method

Syntax `ATS.File.OpenTest(ByVal FileName As String)`

Parameter

Name	Description
FileName	Long Path and File Names permitted up to 128 characters.

Result Boolean

True	File open successful.
False	File open failed.

Description This command loads the designated test file.

Example

```
Sub Main
   OpenResult = ATS.File.OpenTest("FRQ-RESP.ATS2")
   If OpenResult = False Then Call Open_Failed
   ATS.Sweep.Start
   SaveResult = ATS.File.SaveDataAs("FRQ-RESP.ATSA")
   If SaveResult = False Then Call Save_Failed

   OpenResult = ATS.File.OpenTest("THD-FRQ.ATS2")
   If OpenResult = False Then Call Open_Failed
   ATS.Sweep.Start
   SaveResult = File.SaveDataAs("THD-FRQ.ATSA")
   If SaveResult = False Then Call Save_Failed

   OpenResult = ATS.File.OpenTest("RESIDNOI.ATS2")
   If OpenResult = False Then Call Open_Failed
   ATS.Sweep.Start
   SaveResult = ATS.File.SaveDataAs("RESIDNOI.ATSA")
   If SaveResult = False Then Call Save_Failed
```

```
End Sub
Sub Open_Failed
   Debug.Print"Test Open FAILED."
   End
End Sub
Sub Save_Failed
   Debug.Print"Test Save FAILED."
   End
End Sub
```

ATS.File.OpenWfm Method

Syntax **ATS.File.OpenWfm(**ByVal *FileName* As String, ByVal *siOption1* As Integer, ByVal *siOption2* As Integer**)**

Parameter

Name	Description
FileName	Long Path and File Names permitted up to 128 characters.
siOption1	This option defines the buffer that the first waveform in a waveform file is loaded into. 0 = None 1 = Acquisition buffer 1 2 = Acquisition buffer 2 3 = Transform buffer 1 4 = Transform buffer 2
siOption2	This option defines the buffer that the second waveform in a two-waveform file is loaded into. 0 = None 1 = Acquisition buffer 1 2 = Acquisition buffer 2 3 = Transform buffer 1 4 = Transform buffer 2

Result Boolean

True	File open successful.
False	File open failed.

Description This command loads the designated waveform file into the analyzer or generator buffers designated by Option1 and 2.

Comments

Acquisition buffer : This buffer holds waveform data that has been generated by executing an acqusition (F9). Opening a waveform file containing a previously-acquired and saved waveform and specifying the acquisition buffer as the destination permits further analysis of the waveform including FFT spectrum analysis and waveform display.

Transform buffer : The transform buffer is the sub-section of the acquisition buffer starting at the FFT start time with a length equal to the presently-set FFT length.

Buffer 1 : This buffer is associated with the DSP channel 1.

Buffer 2 : This buffer is associated with the DSP channel 2.

Recommended file extensions :

Extension	Description
.AAM	Acquired waveform, 1 channel
.AAS	Acquired waveform, 2 channels

Example

```
Sub Main
   ATS.File.OpenTest("FFTSAVE.ATS2")
   OpenResult = ATS.File.OpenWfm("TEMP.AAS", 1, 2)
   If OpenResult = False Then Call Open_Failed
   ATS.Sweep.Reprocess
End Sub

Sub Open_Failed
   Debug.Print"Waveform Open FAILED."
   End
End Sub
```

ATS.File.SaveAll — Method

Syntax `ATS.File.SaveAll`

Description This command saves the current test and all macros loaded in the macro editor.

ATS.File.SaveDataAs Method

Syntax **ATS.SaveDataAs(**ByVal *FileName* As String**)**

Parameter	**Name**	**Description**
	FileName	Long Path and File Names permitted up to 128 characters.

Result Boolean

True	File save successful.
False	File save failed.

Description This command saves the measurement data in memory to the designated file.

Example See example for `ATS.File.OpenTest`.

ATS.File.SaveTest Method

Syntax **ATS.File.SaveTest**

Result Boolean

True	File save successful.
False	File save failed.

Description This command saves the current test.

Example

```
Sub Main
  ATS.File.OpenTest("FRQ-RESP.AT2R")
  Sweep.Start
  If ATS.File.SaveTest = False Then GoTo Quit
  ATS.File.OpenTest("THD-FRQ.AT2R")
  ATS.Sweep.Start
  If ATS.File.SaveTest = False Then GoTo Quit
  ATS.File.OpenTest("RESIDNOI.AT2R")
  ATS.Sweep.Start
  If ATS.File.SaveTest = False Then GoTo Quit
  End
  Quit:
  Debug.Print "Test Save FAILED"
End Sub
```

ATS.File.SaveTestAs Method

Syntax `ATS.File.SaveTestAs(ByVal FileName As String)`

Parameter

Name	Description
FileName	Long Path and File Names permitted up to 128 characters.

Result Boolean

True	File save successful.
False	File save failed.

Description This command saves the current test as defined by the panels to the designated file. The data currently in memory as well as panel and page configuration information is also saved in the test file.

Example

```
Sub Main
  OpenResult = ATS.File.OpenTest("FRQ-RESP.ATS2")
  If OpenResult = False Then Call Open_Failed
  ATS.Sweep.Start
  SaveResult = ATS.File.SaveTestAs("FRQ-RESP.ATS2")
  If SaveResult = False Then Call Save_Failed

  OpenResult = ATS.File.OpenTest("THD-FRQ.ATS2")
  If OpenResult = False Then Call Open_Failed
  ATS.Sweep.Start
  SaveResult = ATS.File.SaveTestAs("THD-FRQ.ATS2")
  If SaveResult = False Then Call Save_Failed

  OpenResult = ATS.File.OpenTest("RESIDNOI.ATS2")
  If OpenResult = False Then Call Open_Failed
  ATS.Sweep.Start
  SaveResult = ATS.File.SaveTestAs("RESIDNOI.ATS2")
  If SaveResult = False Then Call Save_Failed
End Sub

Sub Open_Failed
  Debug.Print"Test Open FAILED."
  End
End Sub
Sub Save_Failed
  Debug.Print"Test Save FAILED."
  End
```

```
End Sub
```

ATS.File.SaveWfmAs Method

Syntax

ATS.File.SaveWfmAs(ByVal *FileName* As String, ByVal *siOption1* As Integer, ByVal *siOption2* As Integer)

Parameter

Name	Description
FileName	Long Path and File Names permitted up to 128 characters.
siOption1	This option determines the source of the waveform to be stored in the first section of the disk file. 1 = Acquisition buffer 1 2 = Acquisition buffer 2 3 = Transform buffer 1 4 = Transform buffer 2
siOption2	This option determines the source of the waveform to be stored in the last section of the disk file. 0 = None 1 = Acquisition buffer 1 2 = Acquisition buffer 2 3 = Transform buffer 1 4 = Transform buffer 2

Result

Boolean

True	File save successful.
False	File save failed.

Description

This command saves waveform data contained in the buffers designated by Option #1 and #2 into the designated file. The waveform designated by Option #1 saves to the first section of the file and the Option #2 waveform to the last section of the file.

Comment

Acquisition buffer : This buffer holds waveform data captured into DSP memory by an acqusition (F9). Selecting the acquisition buffer causes the complete acquired signal to be saved to a disk file for later download (via the `ATS.File.OpenWfm` command) for further analysis including FFT spectrum analysis and waveform display.

Transform buffer : The transform buffer is the sub-section of the acquisition buffer starting at the FFT start time with a length equal to the presently-set FFT length. Selecting this option results in a smaller disk file since only a portion of the acquired signal is saved.

Buffer 1 : This buffer is associated to the DSP channel 1.

Buffer 2 : This buffer is associated to the DSP channel 2.

Recommended file extensions :

Extension	Description
.AAM	Acquired waveform, 1 channel
.AAS	Acquired waveform, 2 channels

Example

```
Sub Main
  OpenResult = ATS.File.OpenTest "FFTSAVE.ATS2"
  If OpenResult =  False Then Call Open_Failed
  ATS.Sweep.Start
  SaveResult = ATS.File.SaveWfmAs("TEMP.AAS", 1, 2)
  If SaveResult =  False Then Call Save_Failed
End Sub
Sub Open_Failed
  Debug.Print "Open FAILED."
  End
End Sub
Sub Save_Failed
  Debug.Print "Save FAILED."
  End
End Sub
```

Chapter 11

Graph

ATS.Graph.Comment — Property

Syntax **ATS.Graph.Comment**

Data Type String ASCII charactors.

Description This command transfers the ASCII charactors to or from the comment section in the Graph panel to a string variable.

See Also ATS.Graph.CommentAppend, ATS.Graph.CommentShow

Example

```
Public Comment As String

Sub Main
  ATS.Application.NewTest
  ATS2.AGen.OutputOn = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS.Application.Page = 2
  ATS.Graph.CommentShow = True
  Comment = "Run Test"

DisplayDialog:
  Begin Dialog UserDialog 170,84,.DlgHandler
     PushButton 20,14,130,21,"&Run Test",.PushButton1
     CancelButton 20,56,130,21
  End Dialog
  Dim dlg As UserDialog
  Select Case Dialog (dlg)
     Case 0
        ATS.Graph.CommentShow = False
        End
     Case 1
        ATS.Graph.Comment = "Test Running"
```

```
            Wait .5
            ATS.Sweep.Start
            Errors = ATS.Data.LimitError(0)
            If Errors >0 Then
               Comment = "Test FAILED"
            Else
               Comment = "Test PASSED"
            End If
   End Select
   GoTo DisplayDialog
End Sub

Private Function DlgHandler(DlgItem$, Action%,
SuppValue%) As Boolean
   Select Case Action%
   Case 2
      DlgHandler = False
   Case 5
      DlgHandler = True
      ATS.Graph.Comment = Comment$
      Wait .5
      ATS.Graph.Comment = ""
Wait .2
   End Select
End Function
```

ATS.Graph.CommentAppend — Method

Syntax `ATS.Graph.CommentAppend(ByVal Text As String)`

Data Type Void

Parameter

Name	Description
Text	ASCII text.

Description This command appends the ASCII charactors to the comment section in the Graph panel.

See Also `ATS.Graph.Comment, ATS.Graph.CommentShow`

ATS.Graph.CommentShow Property

Syntax **ATS.Graph.CommentShow**

Data Type Boolean

True	Display Comment section.
False	Remove Comment section from view.

Description This command displayes or removes from view the comment section in the Graph panel

See Also ATS.Graph.Comment, ATS.Graph.CommentAppend

Example See example for ATS.Graph.Comment.

ATS.Graph.CopyToSweepPanel Method

Syntax **ATS.Graph.CopyToSweepPanel**

Description This command transfers the current graphic display vertical (Top/Bottom) and horizontal (Start/Stop) axis values to the Sweep panel Data 1, Data 2, and Sweep 1 settings.

Example

```
Sub Main
  ATS.Application.NewTest
  ATS2.AGen.OutputOn = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS2.AnalogIn.Source(apbChB) = apbAnalogInGenMon
  ATS2.Inst.Selection = apbInstFFTAnalyzer
  ATS.Sweep.Data(1).Id = 6024
  ATS.Sweep.Data(2).Id = 6027
  ATS.Sweep.Source1.Id = 5515
  ATS.Sweep.Start
  ATS.Graph.OptimizeLeft
  ATS.Graph.CopyToSweepPanel
  ATS.Sweep.CopySettings(apbData1toData2)
  Wait 5
  ATS.Graph.OptimizeRight
  ATS.Graph.CopyToSweepPanel
```

```
  ATS.Sweep.CopySettings(apbData2toData1)
  Wait 5
  ATS.Graph.OptimizeTogether
  Wait 5
  ATS.Graph.OptimizeIndividually
End Sub
```

ATS.Graph.CursorPosition Property

Syntax **ATS.Graph.CursorPosition(**ByVal *CursorNum* As Integer, ByVal *Unit* As String**)**

Data Type Double

Parameter

Name	Description
CursorNum	1 = Cursor #1 2 = Cursor #2
Unit	Refer to the setting or reading defined by the *column%* parameter to determine the appropriate unit selections.

Description This command returns the horizontal axis position value where the designated cursor is positioned.

See Also ATS.Graph.CursorRow

Example

```
Sub Main
  ATS.Application.NewTest
  ATS2.AGen.OutputOn = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS2.AnalogIn.Source(apbChB) = apbAnalogInGenMon
  ATS2.Inst.Selection = apbInstFFTAnalyzer
  ATS2.Inst.FFT.Window = apbFFTNoneMoveToBinCenter
  ATS.Sweep.Data(1).Id = 6024
  ATS.Sweep.Data(2).Id = 6027
  ATS.Sweep.Source(1).Id = 5515
  ATS.Sweep.CopySettings(apbData1ToData2)
  ATS.Sweep.Start
  ATS.Graph.OptimizeTogether
  ATS.Graph.CursorsOn(True)
```

```
   ATS.Prompt.Text = "Select one of the Traces from _
      the Graph Legend then Position Cursor #1 on _
      the fundamental then press Continue."
   ATS.Prompt.FontSize = 8
   ATS.Prompt.Position(-1,-1,250,150)
   ATS.Prompt.ShowWithContinue
   Stop
   Debug.Print "Frequency = " & _
      Format(ATS.Graph.CursorPosition(1, "Hz"), _
      "##.0000")
   Debug.Print "Data Editor Row = " & _
      ATS.Graph.CursorRow(1)
   Debug.Print "Value = " & _
      Format(ATS.Graph.CursorValue(1, "V"), "##.0000")
End Sub
```

ATS.Graph.CursorRow — Property

Syntax `ATS.Graph.CursorRow(ByVal CursorNum As Integer)`

Data Type Integer

Parameter

Name	Description
CursorNum	1 = Cursor #1 2 = Cursor #2

Description This command returns the nearest row number to the position of the designated cursor. The row number can be used to extract access data in with the `ATS.Data.Value` command.

See Also `ATS.Graph.CursorPosition`

Example See example for `ATS.Graph.CursorPosition`.

ATS.Graph.CursorsOn — Property

Syntax `ATS.Graph.CursorsOn(ByVal bOn As Boolean)`

Parameter

Name	Description
bOn	True = Display cursors.

False = Remove cursors from view.

Result Boolean

True	Cursors displayed.
False	Cursors not displayed. This may be because the Graph Panel is not displayed.

Description This command displays or removes from view the cursors on the Graph panel.

Example See example for `ATS.Graph.CursorPosition`.

ATS.Graph.CursorValue Property

Syntax **`ATS.Graph.CursorValue(`**`ByVal` *`CursorNum`* `As Integer, ByVal` *`Unit`* `As String`**`)`**

Data Type Double

Parameter

Name	Description
CursorNum	1 = Cursor #1 2 = Cursor #2
Unit	Refer to the setting or reading defined by the *column%* parameter to determine the appropriate unit selections.

Description This command returns the vertical axis value where the designated cursor is positioned.

See Also `ATS.Graph.CursorPosition`

Example See example for `ATS.Graph.CursorPosition`.

ATS.Graph.Label Property

Syntax **`ATS.Graph.Label(`**`ByVal` *`AxisId`* `As Constant`**`)`**

Data Type String ASCII text.

Parameter

Name	Description
AxisId	apbAxisTop = Top center. apbAxisBottom = Bottom center.

apbAxisLeft = Left center.
apbAxisRight = Right center.

Description This command set or returns the graph axis Labels.

Example

```
Sub Main
   ATS.Application.NewTest
   ATS2.AGen.OutputOn = True
   ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
   ATS.Sweep.Start
   ATS.Graph.Title = "Title and Labels Example"
   ATS.Graph.LabelAuto(apbAxisLeft) = False
   ATS.Graph.Label(apbAxisLeft) = "Left"
   ATS.Graph.LabelAuto(apbAxisBottom) = False
   ATS.Graph.Label(apbAxisBottom) = "Bottom"
   ATS.Graph.LabelAuto(apbAxisRight) = False
   ATS.Graph.Label(apbAxisRight) = "Right"
   ATS.Graph.LabelAuto(apbAxisTop) = False
   ATS.Graph.Label(apbAxisTop) = "Top"
End Sub
```

ATS.Graph.LabelAuto Property

Syntax `ATS.Graph.LabelAuto(ByVal AxisId As Constant)`

Data Type Boolean

True	Label text generated automatically based on the Sweep Panel settings.
False	Label defined programmatically.

Parameter

Name	Description
AxisId	apbAxisTop = Top center. apbAxisBottom = Bottom center. apbAxisLeft = Left center. apbAxisRight = Right center.

Description This command specifies whether the graph labels are automatically generated based on the Sweep Panel settings or programmatically.

Example See example for `ATS.Graph.Label`.

ATS.Graph.Legend.Comment Property

Syntax `ATS.Graph.Legend.Comment(ByVal SweepId As Integer, ByVal TraceId As Integer)`

Data Type String ASCII text.

Parameter

Name	Description
SweepId	Sweep number.
TraceId	Trace number.

Description This command transfers the ASCII charactors to or from the Legend Trace comment section in the Graph panel to a string variable.

Example

```
Sub Main
  ATS.Application.NewTest
  ATS2.AGen.OutputOn = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS.Sweep.Start
  ATS.Graph.Legend.LineColor(1, 1) = apbRed
  ATS.Graph.TraceShow(1, 1) = True
  ATS.Graph.Legend.LineThickness(1, 1) = 1
  ATS.Graph.Legend.LineStyle(1, 1) = apbSolid
  ATS.Graph.Legend.Comment(1, 1) = "Trace Comment."
End Sub
```

ATS.Graph.Legend.LineColor Property

Syntax `ATS.Graph.Legend.LineColor(ByVal SweepId As Integer, ByVal TraceId As Integer)`

Data Type Constant

apbBlue
apbCyan
apbGray
apbGreen
apbMagenta
apbRed
apbYellow

Parameter	Name	Description
	SweepId	Sweep number.
	TraceId	Trace number.

Description This command sets the Legend Trace Color for the specified Sweep Trace.

Example See example for `ATS.Graph.Legend.Comment`.

ATS.Graph.Legend.LineStyle Property

Syntax **`ATS.Graph.Legend.LineStyle(`**`ByVal SweepId As Integer, ByVal TraceId As Integer`**`)`**

Data Type Constant
apbDash
apbDashDot
apbDashDotDot
apbDot
apbSolid

Parameter	Name	Description
	SweepId	Sweep number.
	TraceId	Trace number.

Description This command sets the Legend Trace Line Style for the specified Sweep Trace.

Example See example for `ATS.Graph.Legend.Comment`.

ATS.Graph.Legend.LineThickness Property

Syntax **`ATS.Graph.Legend.LineThickness(`**`ByVal SweepId As Integer, ByVal TraceId As Integer`**`)`**

Data Type Integer 1-32

Parameter	Name	Description
	SweepId	Sweep number.
	TraceId	Trace number.

Description This command sets the Line Thickness for the specified Sweep Trace.

Example **See example for** `ATS.Graph.Legend.Comment`.

ATS.Graph.OptimizeIndividually Method

Syntax **`ATS.Graph.OptimizeIndividually`**

Description This command optimizes the graph to display all data.

See Also `ATS.Graph.OptimizeLeft, ATS.Graph.OptimizeRight, ATS.Graph.OptimizeTogether`

Example See example for `ATS.Graph.CopyToSweepPanel`.

ATS.Graph.OptimizeLeft Method

Syntax **`ATS.Graph.OptimizeLeft`**

Description This command optimizes the graph to display the data on the Left axis (Data 1).

See Also `ATS.Graph.OptimizeIndividually, ATS.Graph.OptimizeRight, ATS.Graph.OptimizeTogether`

Example See example for `ATS.Graph.CopyToSweepPanel`.

ATS.Graph.OptimizeRight Method

Syntax **`ATS.Graph.OptimizeRight`**

Description This command optimizes the graph to display the data on the Right axis (Data 2).

See Also `ATS.Graph.OptimizeIndividually, ATS.Graph.OptimizeLeft, ATS.Graph.OptimizeTogether`

Example See example for `ATS.Graph.CopyToSweepPanel`.

ATS.Graph.OptimizeTogether Method

Syntax **`ATS.Graph.OptimizeTogether`**

Description This command optimizes the graph to display all data (both Data 1 and Data 2) using the same vertical axis values (Top and Bottom).

See Also `ATS.Graph.OptimizeIndividually, ATS.Graph.OptimizeLeft, ATS.Graph.OptimizeRight`

Example See example for `ATS.Graph.CopyToSweepPanel`.

ATS.Graph.RefDataClear Method

Syntax **`ATS.Graph.OptimizeLeft`**

Description This command Clears all Reference Data from memory. Clearing nonexistent Reference Data does not produce an error.

See Also `ATS.Graph.RefDataShow, ATS.Graph.RefDataStore`

Example

```
Sub Main
   ATS.Graph.RefDataClear
   ATS.Application.NewTest
   ATS2.AGen.OutputOn = True
   ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon

   ATS.Sweep.Start
   ATS.Graph.Data(1).LogLin = apbLin
   ATS.Graph.RefDataStore
   ATS.Graph.RefDataShow = True
   ATS.Graph.OptimizeLeft
   ATS.Graph.CopyToSweepPanel
   ATS.Sweep.Start
End Sub
```

ATS.Graph.RefDataShow — Property

Syntax `ATS.Graph.RefDataShow`

Data Type Boolean

True	Display Reference Data.
False	Remove Reference Data from view.

Description This command makes the Reference Data visable or invisible on the graph.

See Also `ATS.Graph.RefDataClear, ATS.Graph.RefDataStore`

Example See example for `ATS.Graph.RefDataClear`.

ATS.Graph.RefDataStore — Method

Syntax `ATS.Graph.RefDataStore`

Description This command adds the Sweep Data currently in memory to Reference Data memory.

See Also `ATS.Graph.RefDataClear, ATS.Graph.OptimizeRight`

Example See example for `ATS.Graph.RefDataClear`.

ATS.Graph.ScrollBarsOn — Property

Syntax `ATS.Graph.ScrollBarsOn`

Data Type Boolean

True	Display Scroll Bars.
False	Remove Scroll Bars from view.

Description This command makes the Scroll Bars visable or invisible on the graph.

ATS.Graph.Sweeps — Method

Syntax `ATS.Graph.Sweeps`

Data Type Integer

Description This command returns then number of Sweeps contained in the current data set.

See Also `ATS.Graph.SweepTraces`

ATS.Graph.SweepShow — Property

Syntax `ATS.Graph.SweepShow(ByVal SweepId As Integer)`

Data Type Boolean

True	Display Sweep Data.
False	Remove Sweep Data from view.

Parameter

Name	Description
SweepId	Sweep Data number.

Description This command makes the specified Sweep set of traces visable or invisible on the graph.

See Also `ATS.Graph.Sweeps`

ATS.Graph.SweepTraces — Method

Syntax `ATS.Graph.SweepTraces`

Data Type Integer

Description This command returns then number of Sweeps contained in the current data set.

See Also `ATS.Graph.Sweeps`

ATS.Graph.TimeDateShow Property

Syntax `ATS.Graph.TimeDateShow`

Data Type Boolean

True	Display Time and Date.
False	Do not display Time and Date.

Description This command displays or removes from view the Time and Date in the title bar section in the Graph panel.

See Also `ATS.Graph.Title`

ATS.Graph.Title Property

Syntax `ATS.Graph.Title`

Data Type String ASCII characters.

Description This command transfers the ASCII characters to or from the Title section in the Graph panel to a string variable.

See Also `ATS.Graph.TimeDateShow`

ATS.Graph.TraceShow Property

Syntax `ATS.Graph.TraceShow(ByVal SweepId As Integer, ByVal TraceId As Integer)`

Data Type Boolean

True	Trace is displayed.
False	Trace is not displayed.

Parameter

Name	Description
SweepId	Sweep number.
TraceId	Trace number.

Description This command makes the specified Trace visible or invisible on the graph.

See Also `ATS.Graph.Sweeps, ATS.Graph.SweepTraces`

ATS.Graph.ZoomOriginal Method

Syntax **`ATS.Graph.ZoomOriginal`**

Data Type Void

Description This command replaces the current zoomed-in view with the graph coordinates in use when the most recent sweep was started, or with the default initial graph coordinates if no sweep has yet been made since ATS was launched.

See Also `ATS.Graph.ZoomOut`

ATS.Graph.ZoomOut Method

Syntax **`ATS.Graph.ZoomOut`**

Data Type Void

Description This command causes the most recent zoom view to be replaced with the previous one. If you have zoomed repeatedly, the coordinates of each zoom have been saved in sequence in a memory stack. You may then Zoomout repeatedly to work back up through the stack, viewing the series of zoomed views in reverse order.

See Also `ATS.Graph.ZoomOriginal`

User Notes

Chapter 12
Log

ATS.LogFile.AddEntry — Method

Syntax `ATS.LogFile.AddEntry(ByVal Text As String)`

Parameter

Name	Description
Text	Any valid string

Description This command appends the current date and time and the defined string to the log file.

Example

```
Sub Main
  ATS.LogFile.Enable = True
  ATS.LogFile.FileName = "ATS-2.ALG"
  ATS.LogFile.ErrorMessages = True
  ATS.LogFile.FileActivity = True
  ATS.LogFile.PassFailMessages = True
  ATS.LogFile.TestName = True
  ATS.LogFile.GraphTitle = True
  ATS.LogFile.Data = 1
  ATS.LogFile.Clear
  ATS.LogFile.AddEntry "Test Start."
  ATS.LogFile.AddEntryWithoutTimeDate _
    "                          Amplitude Linearity."
  ATS.File.OpenTest "AMPLIN.ATS2"
  ATS.Sweep.Start
  ATS.LogFile.View
  End Sub
```

Output

```
     09/01/01 14:27:01   Test Start.
                         Amplitude Linearity.

     09/01/01 14:27:01   Open Test: AMPLIN.ATS2
PASS 09/01/01 14:27:02   Execute sweep: AMPLIN.ATS2
```

Comment The Example
Output is from the log file created when the example macro is run.

ATS.LogFile.AddEntryWithoutTimeDate — Method

Syntax `ATS.LogFile.AddEntryWithoutTimeDate(ByVal Text As String)`

Parameter

Name	Description
Text	Any valid string

Description This command appends the defined string to the log file.

Example See example for `ATS.LogFile.AddEntry`.

ATS.LogFile.Clear — Method

Syntax `ATS.LogFile.Clear`

Description This command clears the contents of the current log file.

Example See example for `ATS.LogFile.AddEntry`.

ATS.LogFile.Data — Property

Syntax `ATS.LogFile.Data`

Data Type Constant

apbLogNone
None

apbLogAll
All

apbLogFailedDataOnly
Failed data only

Description This command controls whether no test point values (None), all test point values (All), or only those test points which were outside limits

(Failed Data Only) are written into the log file. Any values written into the log file which were outside limits will have parenthesis at the end with the (less than) or (greater than) symbol and the value of the limit which they failed.

Example See example for `ATS.LogFile.AddEntry`.

ATS.LogFile.Enable — Property

Syntax **`ATS.LogFile.Enable`**

Data Type Boolean

True	Enable
False	Disable

Description This command when enabled controls whether logging actually takes place. If disabled, no logging takes place

Example See example for `ATS.LogFile.AddEntry`.

ATS.LogFile.ErrorMessages — Property

Syntax **`ATS.LogFile.ErrorMessages`**

Data Type Boolean

True	Enable
False	Disable

Description This command when enabled logs into the log file any ATS or windows error messages which occur durring the period that logging is enabled.

Example See example for `ATS.LogFile.AddEntry`.

ATS.LogFile.FileActivity — Property

Syntax **`ATS.LogFile.FileActivity`**

Data Type Boolean

True	Enable
False	Disable

Description This command when enabled will enter into the log file a text message for every disk file opened or every file saved to disk. The message includes the name and full path name of the file, and the date and time at which it was opened or saved.

Example See example for `ATS.LogFile.AddEntry`.

ATS.LogFile.FileName — Property

Syntax **`ATS.LogFile.FileName`**

Data Type String

Description This command defines the file name to use for the log file.

Example See example for `ATS.LogFile.AddEntry`.

ATS.LogFile.GraphTitle — Property

Syntax **`ATS.LogFile.GraphTitle`**

Data Type Boolean

True	Enable
False	Disable

Description This command when enabled logs the Graph Title, and the Time and Date at which the test was executed, exactly as they are displayed in the title bar of the graph.

Example See example for `ATS.LogFile.AddEntry`.

ATS.LogFile.PassFailMessages — Property

Syntax **`ATS.LogFile.PassFailMessages`**

Data Type Boolean

True	Enable

False Disable

Description This command when enabled causes an error summary message to be written into the log file each time a test is run. The first word of the message will be PASS or FAIL (See example for `ATS.LogFile.AddEntry`). Following a colon (:) the error message will include the number of measurements which where below the lower limit, the number of measurements that were above the upper limit, and the number of timeouts which occurred. If disabled, no error message is written to the error file.

Example See example for `ATS.LogFile.AddEntry`.

ATS.LogFile.PrintLogFile Method

Syntax **`ATS.LogFile.PrintLogFile`**

Description This command loads the NOTEPAD application and prints the current log file and then closes the NOTEPAD application.

Example

```
Sub Main
  ATS.LogFile.Enable = True
  ATS.LogFile.FileName = "ATS-2.ALG"
  ATS.LogFile.ErrorMessages = True
  ATS.LogFile.FileActivity = True
  ATS.LogFile.PassFailMessages = True
  ATS.LogFile.TestName = True
  ATS.LogFile.GraphTitle = True
  ATS.LogFile.Data = apbLogAll
  ATS.LogFile.Clear
  ATS.LogFile.AddEntry _
"                          Amplitude Linearity."
  ATS.File.OpenTest "AMPLIN.ATS2"
  ATS.Sweep.Start
  ATS.LogFile.PrintLogFile
End Sub
```

ATS.LogFile.TestName Property

Syntax `ATS.LogFile.TestName`

Data Type Boolean

True	Enable
False	Disable

Description This command when enabled logs the test name, including path name, of the test when executed.

Example See example for `ATS.LogFile.AddEntry`.

ATS.LogFile.View Method

Syntax `ATS.LogFile.View`

Description This command loads the NOTEPAD application and displays the current log file.

Example See example for `ATS.LogFile.AddEntry`.

Chapter 13

Macro

ATS.Macro.IsRunning — OLE Method

Syntax `ATS.Macro.IsRunning`

Result Boolean

True	ATS Macro running.
False	ATS Macro not running.

Description This command returns the status of the ATS macro.

Example

```
Private Sub Form_Load()
  Dim ATS As Object
  Set ATS = CreateObject("ATS.Application")
  ATS.Application.Visible = True

  'Place your code here

  ATS.File.OpenMacro "C:\BUSY.ATSB"
  While ATS.Macro.IsRunning = True
  Wend

  ChDir ATS.Application.MacroDir

  'Place your code here

  ATS.Application.Quit
  End
End Sub
```

ATS.Macro.Name

Property

Syntax **ATS.Macro.Name**

Result Boolean ASCII charactors.

Description This command returns the ATS Macro Editor Name. This text string is located in the upper left corner of the ATS Macro/Procedure Editor before the Macro/Procedure name. This string is usefull when using the AppActivate command in the Language reference section of Audio Precision Basic.

See Also ATS.Application.Name

Example

```
Sub Main
  ATS.Application.VisibleMacroEditor = True
  AppActivate ATS.Application.Name
  SendKeys "%WC",1    'Clear all windows on page.
  SendKeys "%PO",1    'Display Data Editor.
  AppActivate ATS.Macro.Name

  'In Debug mode focus is automatically returned to
  ' the editor each time the user interacts with the
  ' controls. Therefore it is important to note that
  ' sections of code containing commands that are to
  ' be sent to other applications via the SendKeys
  ' command need to be executed without interruption.
  'When debugging these areas place breakpoints
  ' before and after the SendKeys commands to
  ' maintain the correct window/application focus.
End Sub
```

Chapter 14

Print

ATS.Printout.Data — Method

Syntax `ATS.Printout.Data`

Result Boolean

True	Printout of tabular data successful.
False	Printout of tabular data failed.

Description This command prints the data displayed in the Data Editor in tabular format. The Data Editor is automatically displayed on the current page if it is not displayed on at least one of the five ATS Pages. The printer is defined by the settings on the File, Print Setup menu.

See Also `ATS.Printout.Graph`

Example

```
Sub Main
  ATS.File.OpenTest("GRAPH.ATS2")
  ATS.Application.PanelOpen(apbDataEditor)
  ATS.Sweep.Start
  ATS.Printout.Data
End Sub
```

ATS.Printout.Graph — Method

Syntax `ATS.Printout.Graph`

Result Boolean

True	Printout of graphic data successful.
False	Printout of graphic data failed.

Description This command sends the graph as defined by the settings on the File, Page Setup menu to the selected printer as define by the File, Print Setup menu. A graph must be displayed on at least one of the five ATS Pages to print or preview the graph.

See Also `ATS.Printout.LoadFromTest`

Example

```
Sub Main
   ATS.File.OpenTest("GRAPH.ATS2")
   ATS.Printout.LoadFromTest
   ATS.File.OpenTest("TEST.ATS2")
   ATS.Sweep.Start
   ATS.Printout.Graph
End Sub
```

ATS.Printout.LoadFromTest — Method

Syntax **`ATS.Printout.LoadFromTest`**

Result Boolean

True	Page Setup settings loaded from test file.
False	Page Setup settings not loaded from test file.

Description This command loads the page setup settings from the currently loaded test. The printout settings are global and can only be changed via this command or manually via the user interacting with the Page Setup menu. This allows the system to produce graphic printouts that have a consistent format over many different tests. Loading a test doesn't automatically update the Page Setup menu and change the graphic output.

See Also `ATS.Printout.Graph`

Example See example macro `ATS.Printout.Graph`.

ATS.Printout.TrackGraph — Property

Syntax **`ATS.Printout.TrackGraph`**

Data Type Boolean

True	Use Graph Trace settings.
False	Use settings defined on Page Setup menu.

Description This command causes the printout Color, Line Style, and Thickness to automatically track the settings used in the Graph Window legend. A graph must be displayed on at least one of the five ATS Pages to print or preview the graph.

See Also `ATS.Printout.LoadFromTest`

Example

```
Sub Main
   ATS.Application.NewTest
   ATS.Printout.TrackGraph = True
   ATS2.AGen.OutputOn = True
   ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
   ATS2.Inst.Analyzer.FuncFilterHP = apbAnlrHP400
   ATS.Sweep.Start
   ATS.Printout.Graph
End Sub
```

User Notes

Chapter 15

Prompt

ATS.Prompt.FontSize — Property

Syntax `ATS.Prompt.FontSize`

Data Type Double Default size = 16.

Description This command sets the font size of the characters used in the User Prompt.

Example

```
Sub Main
   With ATS.Prompt
      .Title = "ATS Prompt"
      .Text = "This prompt will be shown _
         for 5 seconds."
      .FontSize = 8
      .Position(-1,-1,190,120)
      .Show
      Shown = .IsUp
      Wait 5
      .Hide
      Shown = Prompt.IsUp
      .Text = "This prompt will be shown until the _
      Continue Macro button is selected below."
      .ShowWithContinue
      Stop
   End With
End Sub
```

ATS.Prompt.Hide — Method

Syntax `ATS.Prompt.Hide`

Description This command removes the user prompt from view.

Example See example macro `ATS.Prompt.FontSize`.

ATS.Prompt.IsUp Method

Syntax **`ATS.Prompt.IsUp`**

Result Boolean

`True`	User prompt is displayed.
`False`	User prompt is NOT displayed.

Description This command returns the current status of the user prompt.

Example See example for `ATS.Prompt.FontSize`.

ATS.Prompt.Position Method

Syntax **`ATS.Prompt.Position(`**`ByVal` *`X`* `As Integer, ByVal` *`Y`* `As Integer, ByVal` *`CX`* `As Integer, ByVal` *`CY`* `As Integer`**`)`**

Parameter

Name	Description
`X`	This number value is the distance from the left edge of the monitor screen. It is measured in 1/8ths of the average character width for the dialog's font. Setting this number value to -1 centers the prompt horizontally.
`Y`	This number value is the distance from the top edge of the monitor screen. It is measured in 1/12ths of the character height for the dialog's font. Setting this number value to -1 centers the prompt vertically.
`CX`	This number value is the width. It is measured in 1/8ths of the average character width for the dialog's font.
`CY`	This number value is the height. It is measured in 1/12ths of the character height for the dialog's font.

Description This command defines the position and size of the User Prompt.

Example See example for `ATS.Prompt.FontSize`.

ATS.Prompt.Show Method

Syntax `ATS.Prompt.Show`

Description This command displays the user prompt.

See Also `(Language Reference) Stop Instruction`

Example See example for `ATS.Prompt.FontSize`.

ATS.Prompt.ShowWithContinue Method

Syntax `ATS.Prompt.ShowWithContinue`

Description This command displays the current user prompt window with a continue button.

See Also `(Language Reference) Stop Instruction`

Example See example for `ATS.Prompt.FontSize`.

ATS.Prompt.ShowWithContinueAndStopSweep Method

Syntax `ATS.Prompt.ShowWithContinueAndStopSweep`

Description This command displays the current user prompt window with a continue button. When the continue button is selected a sweep if running is terminated.

See Also `(Language Reference) Stop Instruction`

Example

```
Sub Main
  ATS.Application.NewTest
  ATS2.AGen.Ampl(apbChA, "Vrms") = 2
  ATS2.AGen.OutputOn = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS2.Inst.Analyzer.FuncMode = apbAnlrAmplitude
  With ATS.Prompt
     .Text = "Press the Continue button to STOP _
        the SWEEP and continue the Macro."
```

```
        .FontSize = 8
        .Position (-1,-1,180,120)
        .ShowWithContinueAndStopSweep
        ATS.Sweep.Repeat = True
        ATS.Sweep.Start
        .Text = "Press the Continue button to _
           END the Macro."
        .FontSize = 8
        .Position (-1,-1,200,100)
        .ShowWithContinue
        Stop
    End With
End Sub
```

ATS.Prompt.Text — Property

Syntax `ATS.Prompt.Text`

Data Type String — User defined string.

Description This command defines the string to be displayed in a user prompt.

Example See example for `ATS.Prompt.FontSize`.

ATS.Prompt.Title — Property

Syntax `ATS.Prompt.Title`

Data Type String — User defined string.

Description This command transfers ASCII charactors to or from the Title section in a Prompt panel to a string variable.

Example See example for `ATS.Prompt.FontSize`.

Chapter 16
Regulation

ATS.Reg.IsRunning — Method

Syntax **`ATS.Reg.IsRunning`**

Result Boolean

True	Regulation process running.
False	Regulation process not running.

Description This command returns the status of the Regulation process.

See Also `ATS.Macro.LoadFromTest`

Example

```
Sub Main
   ATS.Application.NewTest
   ATS2.AGen.Ampl(apbChA, "dBV") = 0.0
   ATS.Application.PanelOpen(apbRegulation)
   ATS.Reg.TargetID = 6343
   ATS.Reg.TargetValue("dBV") = -80.0
   ATS.Reg.TargetToleranceMode = apbRegdB
   ATS.Reg.TargetTolerance("dB") = 1.0
   ATS.Reg.SourceID = 5052
   ATS.Reg.SourceHigh("dBV") = -70.0
   ATS.Reg.SourceLow("dBV") = -90.0
   ATS.Reg.SourceOperation = apbRegMinusNorm
   ATS.Reg.SourceStepSize("dB") = 0.1
   ATS.Reg.SourceIteration = 30

   ATS.Reg.StartNoWait(True)
   StartTime = Timer
   Do
      Wait .1
      Debug.Print Timer
```

```
   Loop While ATS.Reg.IsRunning And _
      Timer < StartTime + Reg.Timeout
   If ATS.Reg.IsRunning = True Then
      ATS.Reg.StartNoWait(False)
      Debug.Print "Regulation Stopped!"
   End If
End Sub
```

ATS.Reg.SourceHigh — Property

Syntax `ATS.Reg.SourceHigh(ByVal Unit As String)`

Data Type Double — Refer to the setting defined by the `ATS.Reg.SourceId` command (ID#) to determine the appropriate range of acceptable values.

Parameter

Name	Description
Unit	Refer to the setting defined by the `ATS.RegSourceId` conmmand (ID#) to determine the appropriate unit selections.

Description This command sets the upper boundary for the source parameter used in the regulation process.

See Also `ATS.Reg.SourceLow`

Example See example for `ATS.Reg.SourceId`.

ATS.Reg.SourceId — Property

Syntax `ATS.Reg.SourceId`

Data Type Long — Instrument Parameter ID#.

Description This command is used to select the instrument parameter which will define settings used in the regulation process.

Refer to Appendix B to obtain instrument parameter identification numbers.

Example

```
Sub Main
```

```
  ATS.File.OpenTest "REG3.AT2R"
  ATS.Reg.SourceID = 5051
  ATS.Reg.TargetID = 6343
  ATS.Reg.SourceOperation = apbRegPlusNorm
  ATS.Reg.SourceStepSize("%") = 2
  ATS.Reg.SourceIteration = 30
  ATS.Reg.TargetToleranceMode = apbRegPercent
  ATS.Reg.TargetValue("dBrA") = -3
  ATS.Reg.TargetTolerance("%") = 5
  ATS.Reg.SourceHigh("Hz") = 5000
  ATS.Reg.SourceLow("Hz") = 200
  ATS.Reg.SweepEnable = False
  ATS.Reg.Timeout = 2.0
  ATS.Reg.Start
End Sub
```

ATS.Reg.SourceIteration — Property

Syntax `ATS.Reg.SourceIteration`

Data Type Long

Description This command sets the number of Source Iterations. Iterations limit the maximum number of regulation attempt steps the source will make before exiting the search and moving on.

See Also `ATS.Reg.SourceOperation`

Example See example for `ATS.Reg.SourceId`.

ATS.Reg.SourceLow — Property

Syntax `ATS.Reg.SourceLow(ByVal Unit As String)`

Data Type Double

Refer to the setting defined by the `ATS.Reg.SourceId` command (ID#) to determine the appropriate range of acceptable values.

Parameter	Name	Description
	Unit	Refer to the setting defined by the ATS.RegSourceId conmmand (ID#) to determine the appropriate unit selections.

Description This command sets the lower boundary for the source parameter used in the regulation process.

See Also ATS.Reg.SourceHigh

Example See example for ATS.Reg.SourceId.

ATS.Reg.SourceOperation Property

Syntax **ATS.Reg.SourceOperation**

Data Type Constant

apbRegLinear

Linear: assumes a linear relationship between the source setting and the target reading.

apbRegPlusNorm

+ Normal: assumes that an increasing source setting will cause an increasing target reading, but not necessarily linearly.

apbRegMinusNorm

- Normal: assumes that an increasing source setting will cause a decreasing target reading, but not necessarily linearly.

apbRegMax

Maximum: each cycle of regulation starts from the source low boundry value. For example the source will increase by the specified step size as long as the target value also increases. If the target value goes through a peak and starts to decrease, the direction of the source reverses and the step size is cut in half. These half-size steps continue untill the target value again starts to decrease, at which time the direction of change again reverses and the step size is

again cut in half. This process will continue until the number of peak crossings equal the value defined by the `ATS.Reg.SourceIterations` command.

apbRegMin

Minimum: each cycle of regulation starts from the source low boundry value. For example the source will increase by the specified step size as long as the target value decreases. If the target value goes through a notch and starts to increase, the direction of the source reverses and the step size is cut in half. These half-size steps continue untill the target value again starts to increase, at which time the direction of change again reverses and the step size is again cut in half. This process will continue until the number of peak crossings equal the value defined by the `ATS.Reg.SourceIterations` command.

Description This command selects the type of algorithm used to control the source parameter specified by the `ATS.Reg.SourceId` command.

See Also `ATS.Reg.SourceStepSize, ATS.Reg.SourceIteration`

Example See example for `ATS.Reg.SourceId`.

ATS.Reg.SourceStepSize — Property

Syntax **`ATS.Reg.SourceStepSize(`**`ByVal` *`Unit`* `As String`**`)`**

Data Type Double

Parameter

Name	Description
Unit	String that designates the desired unit. The following units are valid for this command: X/Y, dB, %

Description This command sets the Source Step Size for the + Normal, - Normal, Maximum, and Minimum algorithm selections as it begins its search at the beginning of each new regulation process.

See Also `ATS.Reg.SourceOperation, ATS.Reg.SourceIteration`

Example See example for `ATS.Reg.SourceId`.

ATS.Reg.Start — Method

Syntax `ATS.Reg.Start`

Description This command initiates a regulation process.

Example See example for `ATS.Reg.SourceId`.

ATS.Reg.StartNoWait — Method

Syntax `ATS.Reg.StartNoWait(ByVal bStart As Boolean)`

Parameter

Name	Description
bStart	True = Start regulation process. False = Stop regulation process.

Description This command initiates a regulation process and then continues macro execution.

Example See example for `ATS.Reg.SourceId`.

ATS.Reg.SweepEnable — Property

Syntax `ATS.Reg.SweepEnable`

Data Type Boolean

True	Enable regulation for each sweep step.
False	Disable regulation for each sweep step.

Description This command enables or disables regulation before each step in a sweep.

See Also `ATS.Reg.Start`

Example See example for `ATS.Reg.SourceId`.

ATS.Reg.TargetId Property

Syntax `ATS.Reg.TargetId`

Data Type Long Instrument Parameter ID#.

Description This command is used to select the instrument parameter which will return readings used in the regulation process.

Refer to Appendix B to obtain instrument parameter identification numbers.

Example See example for `ATS.Reg.SourceId`.

ATS.Reg.TargetTolerance Property

Syntax `ATS.Reg.TargetTolerance(ByVal Unit As String)`

Data Type Double Refer to the setting defined by the `ATS.Reg.TargetId` command (ID#) to determine the appropriate range of acceptable values.

Parameter

Name	Description
Unit	Refer to the setting defined by the `ATS.RegTargetId` conmmand (ID#) to determine the appropriate unit selections for the Abs selection for the `ATS.Reg.TargetToleranceMode` command. The following units are avalible when % is selected with the `ATS.Reg.TargetToleranceMode` command: X/Y, %

Description This command sets the tolerance that the regulation algorithm uses to determine if the regulation process is complete.

See Also `ATS.Reg.TargetToleranceMode, ATS.Reg.TargetValue`

Example See example for `ATS.Reg.SourceId`.

ATS.Reg.TargetToleranceMode Property

Syntax `ATS.Reg.TargetToleranceMode`

Data Type Constant

apbRegPercent
%

apbRegdB
dB

apbRegAbs
Abs

Description This command selects the type of units the regulation algorithm uses to specify the Target Tolerance.

See Also `ATS.Reg.TargetTolerance, ATS.Reg.TargetValue`

Example See example for `ATS.Reg.SourceId`.

ATS.Reg.TargetValue Property

Syntax `ATS.Reg.TargetValue(ByVal Unit As String)`

Data Type Double — Refer to the setting defined by the `ATS.Reg.TargetId` command (ID#) to determine the appropriate range of acceptable values.

Parameter

Name	Description
Unit	Refer to the setting defined by the `ATS.RegTargetId` conmmand (ID#) to determine the appropriate unit selections.

Description This command sets the Target value that the regulation algorithm attempts to obtain.

See Also `ATS.Reg.TargetTolerance, ATS.Reg.TargetToleranceMode`

Example See example for `ATS.Reg.SourceId`.

ATS.Reg.TimeOut Property

Syntax `ATS.Reg.Timeout`

Data Type Double

Description This command sets the period of time allowed to complete each regulation process.

Example See example for `ATS.Reg.SourceId`.

User Notes

Chapter 17

Sweep

ATS.Sweep.AbortTime — Property

Syntax `ATS.Sweep.AbortTime`

Data Type Double — Time in seconds. Setting an abort time of zero seconds disables the abort function.

Description This command defines the maximum time allowed for a sweep to complete after a sweep is started using any OLE command. *If the abort time is exceeded the current sweep is terminated.* If the `ATS.Data.ColSize` command returns a value less than the number of steps in the sweep then the sweep was aborted. This setting is not routinely monitored therefore accuracy may be in the seconds.

Note: This command is global and affects all subsequent sweeps. Care should be taken when using this command to disable it when finished.

See Also `ATS.Sweep.Start, ATS.Sweep.StartWithAppend, ATS.Sweep.StartWithRepeat, ATS.Data.ColSize`

Example

```
Sub Main
Dim Steps As Integer

  Steps = 100
  ATS.Application.NewTest
  ATS2.AGen.OutputOn = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS2.AnalogIn.Source(apbChB) = apbAnalogInGenMon
  ATS.Sweep.Source(1).Steps = Steps
  ATS.Sweep.AbortTime = 5.0
  ATS.Sweep.Start
```

```
   If ATS.Data.ColSize(0, 0) < Steps Then
      With ATS.Prompt
         .Text = Chr$(13) & "Normal Sweep _
            Time exceeded" & Chr$(13) & _
            Chr$(13) & "Sweep Terminated"
         .FontSize = 8
         .Position(-1,-1,220,150)
         .Show
         Wait 3
         .Hide
      End With
   End If
   ATS.Sweep.AbortTime = 0.0
End Sub
```

ATS.Sweep.Append — Property

Syntax `ATS.Sweep.Append`

Data Type Boolean

True	Append data to current data in memory.
False	Replace current data in memory.

Description This command enables or disables appending data to the end of measurements contained in memory. If append is enabled the measurements in memory are retained and the next sweep will add additional measurements to memory. If append is disabled the measurements in memory are replaced by the next sweep data.

See Also `ATS.Sweep.Repeat, ATS.Sweep.StartWithAppend, ATS.Sweep.StartWithRepeat`

Example

```
Sub Main
   ATS.Application.NewTest
   ATS2.AGen.OutputOn = True
   ATS.Sweep.CreateGraph = True
   ATS.Sweep.CreateTable = False
   ATS.Sweep.GraphType = apbSweepGraphTypeData2onX
   ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
   ATS2.Inst.Analyzer.FuncFilterHP = apbAnlrHP22
```

```
  ATS2.Inst.Analyzer.FuncFilterLP = apbAnlrLPFS2

  'The commands in the following section could be
  replaced with commands for Data1-6
  ATS.Sweep.Data(1).Id = 6343
  ATS.Sweep.Data(1).Limits("None", 1, 1)

  'The commands in the following section could be
  '  replaced with commands for Data2
  ATS.Sweep.Data(1).LogLin = apbLin
  ATS.Sweep.Data(1).AutoDiv = False
  ATS.Sweep.Data(1).Div = 4
  ATS.Sweep.Data(1).Autoscale = True
  ATS.Sweep.Data(1).Top("V") = 1
  ATS.Sweep.Data(1).Bottom("V") = 0
  ATS.Sweep.Source(1).Start("Hz") = 20.0
  ATS.Sweep.Source(1).Stop("Hz") = 60000.0
  ATS.Sweep.PreSweepDelay = 0.2
  ATS.Sweep.Start
  ATS.Sweep.Append = True
  ATS2.Inst.Analyzer.FuncFilterHP = apbAnlrHP100
  ATS2.Inst.Analyzer.FuncFilterLP = apbAnlrLP20k
  ATS.Sweep.Start
  ATS2.Inst.Analyzer.FuncFilterHP = apbAnlrHP400
  ATS2.Inst.Analyzer.FuncFilterLP = apbAnlrLP15K
  ATS.Sweep.Start
  ATS.Graph.OptimizeLeft
End Sub
```

ATS.Sweep.CopySettings — Method

Syntax **ATS.Sweep.CopySettings(**ByVal *Data* As Constant**)**

Data Type Constant

apbData1ToData2

Copy Data 1 settings to Data 2

apbData2ToData1

Copy Data 2 settings to Data 1

Description This command copies the Sweep panel settings from one Data to the other.

Example

```
Sub Main
  ATS.Application.NewTest
  ATS2.AGen.OutputOn = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS2.AnalogIn.Source(apbChB) = apbAnalogInGenMon
  ATS2.Inst.Selection = apbInstFFTAnalyzer
  ATS.Sweep.Data(1).Id = 6024
  ATS.Sweep.Data(2).Id = 6027
  ATS.Sweep.Source(1).Id = 5515
  ATS.Sweep.Start
  ATS.Graph.OptimizeLeft
  ATS.Graph.CopyToSweepPanel
  ATS.Sweep.CopySettings(apbData1ToData2)
  Wait 5
  ATS.Graph.OptimizeRight
  ATS.Graph.CopyToSweepPanel
  ATS.Sweep.CopySettings(apbData2ToData1)
End Sub
```

ATS.Sweep.CreateGraph — Property

Syntax **ATS.Sweep.CreateGraph**

Data Type Boolean

True	Display a graph window when starting the sweep if a graph window is not displayed.
False	Do not create a graph window when starting the sweep.

Description This command enables or disables creation of the graph window when a sweep is run.

See Also ATS.Sweep.CreateTable, ATS.Sweep.GraphType

Example See example for ATS.Sweep.Append.

ATS.Sweep.CreateTable Property

Syntax `ATS.Sweep.CreateTable`

Data Type Boolean

True	Display a Data Table window when starting the sweep if a Data Table window is not displayed.
False	Do Not create a Data Table window when starting the sweep.

Description This command enables or disables creation of the Data Table window when a sweep is run.

See Also `ATS.Sweep.CreateGraph, ATS.Sweep.GraphType`

Example See example for `ATS.Sweep.Append`.

ATS.Sweep.Data.AutoDiv Property

Syntax `ATS.Sweep.Data(ByVal Number As Integer).AutoDiv`

Data Type Boolean

True	Automatically select the number of divisions.
False	Use the number of divisions defined by the ATS.Sweep.Data1.Div command.

Parameter	Name	Description
	Number	Sweep Data selection number (1-2).

Description This command enables or disables automatic selection of the number of linear vertical axis divisions displayed for Data 1 or Data 2.

See Also `ATS.Sweep.Data(1).Div, ATS.Sweep.Data(1).LogLin`

Example See example for `ATS.Sweep.Append`.

ATS.Sweep.Data.Autoscale Property

Syntax `ATS.Sweep.Data(ByVal Number As Integer).Autoscale`

Data Type Boolean

True	Autoscale graph vertical axis for Data (?).
False	Do Not Autoscale graph vertical axis for Data 1.

Parameter

Name	Description
Number	Sweep Data selection number (1-2).

Description This command enables or disables automatic scaling of the graph vertical axis Top and Bottom values for Data 1 and Data 2. The Data 1 vertical axis is shown on the left axis of the graph and Data 2 on the right axis.

Example See example for `ATS.Sweep.Append`.

ATS.Sweep.Data.Bottom Property

Syntax `ATS.Sweep.Data(ByVal Number As Integer).Bottom(ByVal Unit As String)`

Data Type Double — Enter a value that is to be displayed at the bottom of the graph left axis.

Parameter

Name	Description
Number	Sweep Data selection number (1-2).
Unit	Refer to the setting or reading defined by the `ATS.Sweep.Data(?).Id` command to determine the appropriate unit selections.

Description This command defines the bottom value on the graph vertical axes located on the left and right sides of the graph window.

See Also `ATS.Sweep.Data.Top`

Example See example for `ATS.Sweep.Append`.

ATS.Sweep.Data.Div — Property

Syntax `ATS.Sweep.Data(ByVal Number As Integer).Div`

Data Type Long — Number of divisions displayed.

Parameter

Name	Description
Number	Sweep Data selection number (1-2).

Description This command sets the number of divisions that are to be displayed for a linear vertical axis defined on Data 1 and Data 2. Automatic scaling of the vertical axes must be disabled using the `ATS.Sweep.Data.AutoDiv` comand.

See Also `ATS.Sweep.Data.AutoDiv, ATS.Sweep.Data.LogLin`

Example See example for `ATS.Sweep.Append`.

ATS.Sweep.Data.Id — Property

Syntax `ATS.Sweep.Data(ByVal Number As Constant).Id`

Data Type Long — Instrument Parameter ID#.

Parameter

Name	Description
Number	Sweep Data selection number (1-6).

Description This command is used to select the instrument parameter, which will return readings for Data 1-6.

Refer to Appendix B to obtain instrument parameter identification numbers.

Example See example for `ATS.Sweep.Append`.

ATS.Sweep.Data.Limit.Column — Get Only Property

Syntax `ATS.Sweep.Data(ByVal DataNumber As Integer).Limit(ByVal Limit As Constant).Column`

Data Type Integer — Column number.

Parameter	Name	Description
	DataNumber	Sweep Data selection number (1-6)
	Limit	apbUpper Upper limit. apbLower Lower limit.

Description This command sets the Column number of the data used in the attached limit file for the specified Limit.

See Also `ATS.Sweep.Data.Limits`, `ATS.Sweep.Data.Limit.FileName`

ATS.Sweep.Data.Limit.FileName — Get Only Property

Syntax **`ATS.Sweep.Data(`**`ByVal` *`DataNumber`* `As Integer`**`).Limit(`**`ByVal Limit As Constant`**`).FileName`**

Data Type In++teger Column number.

Parameter	Name	Description
	DataNumber	Sweep Data selection number (1-6)
	Limit	apbUpper Upper limit. apbLower Lower limit.

Description This command returns the File Name used for the Upper and or Lower Limit of a Sweep Data.

See Also `ATS.Sweep.Data.Limits`, `ATS.Sweep.Data.Limit.Column`

ATS.Sweep.Data.Limits — Method

Syntax **`ATS.Sweep.Data(`**`ByVal` *`Number`* `As Integer`**`).Limits(`**`ByVal` *`PathName`* `As String, ByVal` *`Column`* `As Integer, ByVal` *`Upper`* `As Boolean`**`)`**

Parameter	Name	Description
	Number	Sweep Data selection number (1-6).
	PathName	Any valid DOS path and file name. The file must be an ATS limit file (.atsl). Enter "None" for the file name to remove the limit file from Data (?).

Column	1 = Data 1 measurements. 2 = Data 2 measurements. 3 = Data 3 measurements. 4 = Data 4 measurements. 5 = Data 5 measurements. 6 = Data 6 measurements.
Upper	True = Upper Limit. False = Lower Limit.

Result Boolean

True	File attachment successful.
False	File attachment failed.

Description This command attaches or removes a limit file from Data 1-6 for upper or lower limit comparisions.

See Also `ATS.Sweep.Recompare`

Example

```
Sub Main
  ATS.LogFile.Enable = False
  ATS.File.OpenTest "CODEC.ATS2"
  ATS.Sweep.Start
  ATS.File.SaveDataAs "MASK.ATSL"
  ATS.Application.NewData
  ATS2.Inst.FastTest.Mode = apbFastTestSpectrum
  ATS.Sweep.Reprocess
  ATS.Sweep.Source1.Table ("CODEC.ATSS", 0)
  ATS2.Inst.FastTest.Mode = apbFastTestResponse
  ATS.Sweep.Reprocess
  ATS.Sweep.Data(1).Limits("MASK.ATSL", 1, True)
  ATS.Sweep.Data(3).Limits("Mask.ATSL", 1, True)
  ATS2.Inst.FastTest.Mode = apbFastTestDistortion
  ATS.Sweep.Reprocess
  ATS2.Inst.FastTest.Mode = apbFastTestNoise
  ATS.Sweep.Reprocess
End Sub
```

ATS.Sweep.Data.LogLin — Property

Syntax `ATS.Sweep.Data(ByVal Number As Integer).LogLin`

Data Type Constant

apbLog
Logarithmic vertical axis.

apbLin
Linear vertical axis.

Parameter	Name	Description
	Number	Sweep Data selection number (1-2).

Description This command determines the Data 1 and Data 2 vertical axis data scaling type.

See Also `ATS.Sweep.Data.Div, ATS.Sweep.Data.AutoDiv`

Example See example for `ATS.Sweep.Append`.

ATS.Sweep.Data.Top — Property

Syntax **`ATS.Sweep.Data(`**`ByVal` *`Number`* `As Integer`**`).Top(`**`ByVal` *`Unit`* `As String`**`)`**

Data Type Double — Enter a value that is to be displayed at the top of the graph left axis.

Parameter	Name	Description
	Number	Sweep Data selection number (1-2).
	Unit	Refer to the setting or reading defined by the `ATS.Sweep.Data.Id` command to determine the appropriate unit selections.

Description This command defines the top value on the graph vertical axes located on the left and right sides of the graph window.

See Also `ATS.Sweep.Data.Bottom`

Example See example for `ATS.Sweep.Append`.

ATS.Sweep.External.StartOnRule Property

Syntax `ATS.Sweep.External.StartOnRule`

Data Type Integer

0	**Within Start Tolerance**: (Default) Data collection begins as soon as a settled reading is detected that is within the Start value plus or minus the Spacing tolerance as specified by the `ATS.Sweep.Source.Start`, and `ATS.Sweep.Source.Spacing` commands.
1	**Beyond Start Value**: Data collection begins as soon as a settled reading is detected that is within the Start and Stop values as specified by the `ATS.Sweep.Source.Start` and `ATS.Sweep.Source.Stop` commands. Additional readings are retained as long as the readings satisfy the sweep direction and Spacing requirement as specified by the `ATS.Sweep.Source.Spacing` command.
2	**Any Settled Reading**: Data collection begins as soon as a settled reading is detected. Additional readings are retained as long as the readings satisfy the sweep direction and Spacing requirements as specified by the `ATS.Sweep.Source.Start`, `ATS.Sweep.Source.Stop`, and `ATS.Sweep.Source.Spacing` commands.

Description This command selects the external sweep Start On rule.

See Also `ATS.Sweep.Source.Start, ATS.Sweep.Source.Stop, ATS.Sweep.Source.Spacing`

Example

```
Sub Main
  AP.Application.VisibleMacroEditor False
  Begin Dialog UserDialog 390,231,"External Sweep
Rules" ' %GRID:10,7,1,1
     Text 20,7,350,70,"Sets External Sweep
""Start-On"" rules.  Default setting starts sweep
when the Source1 meter reading is within the Start
"&Chr(177)&" Spacing field settings. This setting is
not saved with the test.  It is global and applies to
```

```
ALL external tests until changed or ATS is restarted.
Current ""Start-On"" setting is indicated."
     GroupBox 20,84,350,98,"  START - ON  RULE  "
     Text 30,98,320,14, _
        "Starts Sweep when Source1 meter reading _
        is - ",.Text1
     OptionGroup .StartOnRule
        OptionButton 50,119,300,14, _
           "Within Start " & Chr(177) & _
           " Spacing  settings."
        OptionButton 50,140,300,14, _
           "Beyond the Start setting."
        OptionButton 50,161,300,14, _
           "Any settled reading."
     OKButton 20,196,140,21
     CancelButton 280,196,90,21
  End Dialog
  Dim dlgXstartOn As UserDialog
  dlgXstartOn.StartOnRule =
AP.Sweep.External.StartOnRule
'Get current setting and set dialog option buttons to
match
  If Dialog(dlgXstartOn) = 0 Then Exit Sub
           'If cancel, end
  Select Case(dlgXstartOn.StartOnRule)
     Case 0      '+-Tolerance
        AP.Sweep.External.StartOnRule = _
           apbExtWithinTolerance
     Case 1      'Beyond Start setting
        AP.Sweep.External.StartOnRule = - _
           apbExtBeyondStart
     Case 2      'No requirement
        AP.Sweep.External.StartOnRule = _
           apbExtNone
  End Select
End Sub
```

ATS.Sweep.GraphType

Property

Syntax **`ATS.Sweep.GraphType`**

Data Type Constant

`apbSweepGraphTypeXY`
X - Y mode. Data 1-6 measurements are displayed on the vertical axis and Source settings are displayed on the horizontal axis.

`apbSweepGraphTypeData2onX`
X - Y Data2 on X mode. Data 1, and 3-6 measurements are displayed on the vertical axis and Data 2 readings are displayed on the horizontal axis.

Description This command selects the graph display mode. The `ATS.Sweep.Data.Id` must be defined.

See Also `ATS.Sweep.Data.Id`

Example See example for `ATS.Sweep.Append`.

ATS.Sweep.IsRunning

Property

Syntax **`ATS.Sweep.IsRunning`**

Result Boolean

`True`	Sweep process running.
`False`	Sweep process not running.

Description This command returns the status of the Sweep process.

Example See example for `ATS.Sweep.Stop`.

ATS.Sweep.PreSweepDelay

Property

Syntax **`ATS.Sweep.PreSweepDelay`**

Data Type Double 0.0 to 3.0 sec.

Description This command sets a user-controllable time delay value inserted after the `ATS.Sweep.Start` command is executed, before the first data point is taken. This can be valuable when the device under test needs a certain amount of setup time before it operates normally, or to allow for full autoranging and other time within the instrument. In nested sweeps, this Pre-Sweep Delay is inserted before the start of each sweep of the test.

The Pre-Sweep Delay field is located on the right half of the large version of the Sweep panel, below the Data 3-Data 6 Limits buttons.

See Also `ATS.Sweep.Start`

Example See example for `ATS.Sweep.Append`.

ATS.Sweep.Recompare — Method

Syntax **`ATS.Sweep.Recompare`**

Result Boolean

True	Recompare successful.
False	Recompare failed.

Description This command causes any sweep result currently in memory to be regraphed and compared to limits if limit files are attached to any Data (Data 1 - Data 6) variable via the test configuration or usage of the `ATS.Sweep.Data.Limits command.`

This command is equivalent to F7 in ATS.

See Also `ATS.Sweep.Data.Limits`

ATS.Sweep.Repeat — Property

Syntax **`ATS.Sweep.Repeat`**

Data Type Boolean

True	Repeat sweep continuously.
False	Do not repeat sweep continuously.

Description This command enables or disables repeating the currently defined sweep indefinitely.

See Also `ATS.Sweep.Append, ATS.Sweep.StartWithAppend, ATS.Sweep.StartWithRepeat`

Example

```
Sub Main
   ATS.Application.NewTest
   ATS2.AGen.OutputOn = True
   ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
   ATS.Application.PanelOpen(apbSweep, apbSmall)
   ATS.Prompt.Text = "Press Continue to Stop Sweep."
   ATS.Prompt.FontSize = 8
   ATS.Prompt.Position(-1,-1,190,120)
   Begin Dialog UserDialog 310,154,"Sweep Controler"
      PushButton 100,7,100,21,"Single _
         sweep",.PushButton1
      PushButton 30,35,250,21,"Single sweep and _
         Append",.PushButton3
      PushButton 30,56,250,21,"Start repeating _
         sweep",.PushButton2
      PushButton 30,77,250,21,"Start repeating sweep _
         with Append",.PushButton4
      CancelButton 60,119,190,21
   End Dialog
   Dim dlg As UserDialog

   DisplayDialog:
   Select Case Dialog (dlg)
      Case 0
         ATS.Sweep.Append = False
         ATS.Sweep.Repeat = False
         End
      Case 1
         ATS.Sweep.Append = False
         ATS.Sweep.Repeat = False
         Sweep.Start
      Case 2
         ATS.Sweep.Repeat = False
         ATS.Sweep.StartWithAppend
      Case 3
```

```
            ATS.Sweep.Append = False
            ATS.Prompt.ShowWithContinueAndStopSweep
            ATS.Sweep.StartWithRepeat
         'Start sweep
            ATS.Sweep.Repeat = False
         Case 4
            ATS.Sweep.Append = True
            ATS.Sweep.Repeat = True
            ATS.Prompt.ShowWithContinueAndStopSweep
            ATS.Sweep.Start
            'Start sweep
            ATS.Sweep.Repeat = False
   End Select
   GoTo DisplayDialog
End Sub
```

ATS.Sweep.Reprocess — Method

Syntax `ATS.Sweep.Reprocess`

Result Boolean

True	Reprocess successful.
False	Reprocess failed.

Description This command instructs ATS to cause the third phase of the following process to be performed.

FFT-based (batch mode) DSP programs have three distinct, sequential phases to their operation.

First, data is accumulated into the acquisition buffer until the buffer is filled to the specified acquisition length.

Second, a Fast Fourier Transform (FFT) is performed to obtain amplitude (and sometimes phase) versus frequency data which is stored in a different memory buffer from the acquired signal (amplitude versus time).

Third, a post-processed version of the amplitude versus time or amplitude versus frequency data (depending upon sweep Source 1

and Data 1 or 2) is transmitted from the DSP module in the test system to the computer for graphing by ATS software.

This command is equivalent to Ctrl+F6 in ATS.

Example See example for `ATS.Sweep.Data.Limits`.

ATS.Sweep.Retransform — Method

Syntax **`ATS.Sweep.Retransform`**

Result Boolean

`True`	Retransform successful.
`False`	Retransform failed.

Description This command instructs ATS to cause the second and third phases of the following process to be performed.

FFT-based (batch mode) DSP programs have three distinct, sequential phases to their operation.

First, data is accumulated into the acquisition buffer until the buffer is filled to the specified acquisition length.

Second, a Fast Fourier Transform (FFT) is performed to obtain amplitude (and sometimes phase) versus frequency data which is stored in a different memory buffer from the acquired signal (amplitude versus time).

Third, a post-processed version of the amplitude versus time or amplitude versus frequency data (depending upon sweep Source 1 and Data 1 or 2) is transmitted from the DSP module in the test system to the computer for graphing by ATS software.

This command is equivalent to F6 in ATS.

Example

```
Sub Main
  ATS.Application.NewTest
  ATS2.AGen.OutputOn = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS2.Inst.Selection = apbInstFFTAnalyzer
  ATS2.Inst.FFT.TransformLength = apbFFT16k
```

```
  ATS2.Inst.FFT.Window = apbFFTBlackmanHarris
  ATS.Sweep.Data(1).Id = 6024
  ATS.Sweep.Source1.Id = 5515
  ATS.Sweep.Start
  ATS.Sweep.Append = True
  ATS2.Inst.FFT.Window = apbFFTHann
  ATS.Sweep.Retransform
  ATS2.Inst.FFT.Window = apbFFTFlatTop
  ATS.Sweep.Retransform
  ATS2.Inst.FFT.Window = apbFFTEquiripple
  ATS.Sweep.Retransform
  ATS2.Inst.FFT.Window = apbFFTNone
  ATS.Sweep.Retransform
  ATS.Graph.OptimizeLeft
End Sub
```

ATS.Sweep.SinglePoint — Property

Syntax `ATS.Sweep.SinglePoint`

Data Type Boolean

True	Enable single point sweep.
False	Disable single point sweep.

Description This command sets the Source 1 Sweep to Single Point mode. When a sweep is initiated (`ATS.Sweep.Start`) the Data Editor will be automatically displayed and a single measurement taken at the Sweep Start value of Source 1.

See Also `ATS.Sweep.Source1.Start`

Example

```
Sub Main
  ATS.Application.NewTest
  ATS2.AGen.OutputOn = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS2.Inst.Selection = apbInstFFTAnalyzer
  ATS.Sweep.Repeat = False
  ATS.Sweep.SinglePoint = False
  ATS.Sweep.Stereo = False
  ATS.Sweep.Timeout("sec") = 3
```

```
  ATS.Sweep.Source(1).Id = 5015
  ATS.Sweep.Source(1).LogLin = 1
  ATS.Sweep.Source(1).Start("Hz") = 20000
  ATS.Sweep.Source(1).Stop("Hz") = 20
  ATS.Sweep.Source(1).Steps = 15
  ATS.Sweep.Source(1).AutoDiv = False
  ATS.Sweep.Source(1).Div = 10
  ATS.Sweep.Source(2).Id = 5052
  ATS.Sweep.Source(2).LogLin = apbLin
  ATS.Sweep.Source(2).Start("Vrms") = 5
  ATS.Sweep.Source(2).Steps = 2
  ATS.Sweep.Source(2).Stop("Vrms") = 1
  ATS.Sweep.Start
End Sub
```

ATS.Sweep.Source.AutoDiv — Property

Syntax `ATS.Sweep.Source(ByVal Number As Integer).AutoDiv`

Data Type Boolean

True	automatically select the number of divisions.
False	Use the number of divisions defined by the ATS.Sweep.Source1.Div command.

Parameter

Name	Description
Number	Sweep Source selection number (1 only).

Description This command enables or disables automatic selection of the number of linear horizontal axis divisions displayed for Source 1 sweeps.

See Also `ATS.Sweep.Source.Div, ATS.Sweep.Source.LogLin`

Example See example for `ATS.Sweep.SinglePoint`.

ATS.Sweep.Source.Div — Property

Syntax `ATS.Sweep.Source(ByVal Number As Integer).Div`

Data Type Long Number of divisions displayed.

Parameter	Name	Description
	Number	Sweep Source selection number (1 only).

Description This command sets the number of divisions that are to be displayed for a linear horizontal axis for a Source 1. The `ATS.Sweep.Source1.AutoDiv` must be disabled.

See Also `ATS.Sweep.Source.AutoDiv`, `ATS.Sweep.Source.LogLin`

Example See example for `ATS.Sweep.SinglePoint`.

ATS.Sweep.Source.EndOn Property

Syntax **`ATS.Sweep.Source(`**`ByVal` *`Number`* `As Integer`**`).EndOn(`**`ByVal` *`Unit`* `As String`**`)`**

Data Type Double Refer to the setting or reading defined by the `ATS.Sweep.Source1.Id` command to determine the appropriate range of acceptable values.

Parameter	Name	Description
	Number	Sweep Source selection number (1 only).
	Unit	Refer to the setting or reading defined by the `ATS.Sweep.Source.Id` command to determine the appropriate unit selections.

Description This command sets the Sweep End value for an external sweep. The sweep will be considered to have finished when the Source 1 parameter reverses its direction (starts to change in the direction from Stop to Start) to the End On value.

It is frequently necessary to make and graph a series of measurements where some external, uncontrollable source is the independent variable. Common examples include frequency response measurements or other swept tests where the sweeping signal is pre-recorded on a test tape or test CD, or testing of a transmission link where a remote generator (not under control of ATS software) is providing the signal. In these cases, ATS software cannot

control the values, direction of progression (high to low versus low to high), or dwell times of the signal. ATS can, however, measure the changing parameter of the incoming signal (usually frequency but sometimes level) and use those measurements as the X-axis calibration. This mode of operation, where a measurement (Reading) drives the data-taking process and calibrates the X-axis, is called External Sweep.

Example

```
Sub Main
  ATS.Application.NewTest
  ATS.Sweep.Source(1).Id = 6009
  ATS.Sweep.Source(1).EndOn("Hz") = 2500
  ATS.Sweep.Source(1).MinLevelID = 6341
  ATS.Sweep.Source(1).MinLevel("dBu") = -40
  ATS.Sweep.Source(1).Spacing("%") = 3
  ATS.Sweep.Start
End Sub
```

ATS.Sweep.Source.Id — Property

Syntax `ATS.Sweep.Source(ByVal Number As Constant).Id`

Data Type Long — Instrument Parameter ID#.

Parameter

Name	Description
Number	Sweep Source selection number (1-2).

Description This command is used to select the instrument parameter which will define settings or return readings, in the case of external sweeps, for Source 1 and Source 2.

Refer to Appendix B to obtain instrument parameter identification numbers.

Example See example for `ATS.Sweep.SinglePoint`.

ATS.Sweep.Source.LogLin — Property

Syntax `ATS.Sweep.Source(ByVal Number As Integer).LogLin`

Data Type Integer

0	Logarithmic horizontal axis and step type.
1	Linear horizontal axis and step type.

Parameter	**Name**	**Description**
	Number	Sweep Source selection number (1 only).

Description This command determines the Source 1 horizontal axis type and the sweep step type.

See Also `ATS.Sweep.Source.Div, ATS.Sweep.Source.AutoDiv`

Example See example for `ATS.Sweep.SinglePoint`.

ATS.Sweep.Source.MinLevel — Property

Syntax **`ATS.Sweep.Source(`**`ByVal` *`Number`* `As Integer`**`).MinLevel(`**`ByVal` *`Unit`* `As String`**`)`**

Data Type Double — Refer to the reading defined by the `ATS.Sweep.Source.MinLevelId` command to determine the appropriate range of acceptable values.

Parameter	**Name**	**Description**
	Number	Sweep Source selection number (1 only).
	Unit	Refer to the reading defined by the `ATS.Sweep.Source.MinLevelId` command to determine the appropriate unit selections.

Description This command sets the minimum input signal level at which measurements will be taken during an external sweep (reading instead of setting at Source 1). The purpose of this command is to avoid taking measurements during the "dead time" between tracks of a test tape or test CD, when noise still produces some finite signal level.

It is frequently necessary to make and graph a series of measurements where some external, uncontrollable source is the independent variable. Common examples include frequency response measurements or other swept tests where the sweeping signal is pre-recorded on a test tape or test CD, or testing of a

transmission link where a remote generator (not under control of ATS software) is providing the signal. In these cases, ATS software cannot control the values, direction of progression (high to low versus low to high), or dwell times of the signal. ATS can, however, measure the changing parameter of the incoming signal (usually frequency but sometimes level) and use those measurements as the X-axis calibration. This mode of operation, where a measurement (Reading) drives the data-taking process and calibrates the X-axis, is called External Sweep.

See Also `ATS.Sweep.Data.Id, ATS.Sweep.MinLevelSource`

ATS.Sweep.Source.MinLevelId — Property

Syntax `ATS.Sweep.Source(ByVal Number As Integer).MinLevelId`

Data Type Long — Instrument Parameter ID#.

Parameter

Name	Description
Number	Sweep Source selection number (1 only).

Description This command is used to select the instrument parameter which will define settings or return readings, in the case of external sweeps, for Source 1.

Refer to Appendix B to obtain instrument parameter identification numbers.

ATS.Sweep.Source.Multiply — Property

Syntax `ATS.Sweep.Source(ByVal Number As Integer).Multiply`

Data Type Double

Parameter

Name	Description
Number	Sweep Source selection number (1-2).

Description This command sets the Source(?) Log Sweep Multiply factor used to determine the next Source(?) sweep setting.

See Also `ATS.Sweep.Source.Start, ATS.Sweep.Source.Stop, ATS.Sweep.Source.LogLin, ATS.Sweep.Source.Steps`

ATS.Sweep.Source.Spacing — Property

Syntax `ATS.Sweep.Source(ByVal Number As Integer).Spacing(ByVal Unit As String)`

Data Type Double

Parameter

Name	Description
Number	Sweep Source selection number (1 only).
Unit	% unit only.

Description This command sets the minimum change of the Source 1 Reading (ID#) Property parameter required to allow an additional external sweep measurement to be taken. This setting is only available for external sweeps.

Example See example for `ATS.Sweep.Source,EndOn`.

ATS.Sweep.Source.Start — Property

Syntax `ATS.Sweep.Source(ByVal Number As Integer).Start(ByVal Unit As String)`

Data Type Double — Refer to the setting or reading defined by the `ATS.Sweep.Source.Id` command to determine the appropriate range of acceptable values.

Parameter

Name	Description
Number	Sweep Source selection number (1-2).
Unit	Refer to the setting or reading defined by the `ATS.Sweep.Source.Id` command to determine the appropriate unit selections.

Description This command sets the first setting value to be sent to the instrument parameter specified as Source(?).

See Also `ATS.Sweep.Source.Stop`

Example See example for `ATS.Sweep.Append`.

ATS.Sweep.Source.Steps Property

Syntax **`ATS.Sweep.Source(`**`ByVal` *`Number`* `As Integer`**`).Steps`**

Data Type Long

Parameter

Name	Description
`Number`	Sweep Source selection number (1-2).

Description This command sets the number of Source(?) steps that a log or linear sweep makes between the Source Start and Stop values.

See Also `ATS.Sweep.Source.Start, ATS.Sweep.Source.Stop, ATS.Sweep.Source.LogLin, ATS.Sweep.Source.StepSize`

Example See example for `ATS.Sweep.SinglePoint`.

ATS.Sweep.Source.StepSize Property

Syntax **`ATS.Sweep.Source(`**`ByVal` *`Number`* `As Integer`**`).StepSize(`**`ByVal` *`Unit`* `As String`**`)`**

Data Type Double Source step size.

Description This command sets the Source Linear Sweep Step Size used to determine the next Source sweep setting.

Parameter

Name	Description
`Number`	Sweep Source selection number (1-2).
`Unit`	Refer to the setting or reading defined by the `ATS.Sweep.Source.Id` command to determine the appropriate unit selections.

See Also `ATS.Sweep.Source.Start, ATS.Sweep.Source.Stop, ATS.Sweep.Source.LogLin, ATS.Sweep.Source.Steps`

ATS.Sweep.Source.Stop — Property

Syntax `ATS.Sweep.Source(ByVal Number As Integer).Stop(ByVal Unit As String)`

Data Type Double — Refer to the setting or reading defined by the `ATS.Sweep.Source.Id` command to determine the appropriate range of acceptable values.

Parameter

Name	Description
Number	Sweep Source selection number (1-2).
Unit	Refer to the setting or reading defined by the `ATS.Sweep.Source.Id` command to determine the appropriate unit selections.

Description This command sets the last setting value to be sent to the instrument parameter specified as Source(?).

See Also `ATS.Sweep.Source.Start`

Example See example for `ATS.Sweep.Append`.

ATS.Sweep.Source.Table — Method

Syntax `ATS.Sweep.Source(ByVal Number As Integer).Table(ByVal FileName As String, ByVal Column As Integer)`

Parameter

Name	Description
Number	Sweep Source selection number (1 only).
FileName	Any valid DOS path and file name. The file must be an ATS sweep file (.atss). Enter "None" for the file name to remove the sweep file from Source1.
Column	0 = Source 1 settings. 1 = Data 1 measurements. 2 = Data 2 measurements.

3 = Data 3 measurements.
4 = Data 4 measurements.
5 = Data 5 measurements.
6 = Data 6 measurements.
7 = Source 2 settings.

Result Boolean

True	File attachment successful.
False	File attachment failed.

Description This command attaches a sweep file to Source 1. Values in the file will be used as Source 1 settings, rather than Start, Stop, Steps, and Multiply, or Stepsize values. The Start and Stop values will continue to be used to define the horizontal end points of the graph.

ATS.Sweep.Source.TableColumn — Get Only Property

Syntax `ATS.Sweep.Source(ByVal DataNumber As Integer).TableColumn`

Data Type Integer — Column number.

Parameter

Name	Description
DataNumber	Sweep Data selection number (1-6)

Description This command sets the column number of the data in the attached Sweep Table file (.atss) to be used as the Sweep Table.

See Also `ATS.Sweep.Source.TableFileName`

ATS.Sweep.Source.TableFileName — Get Only Property

Syntax `ATS.Sweep.Source(ByVal DataNumber As Integer).TableFileName`

Data Type Integer — Column number.

Parameter

Name	Description
DataNumber	Sweep Data selection number (1-6)

Description This command sets the File Name used for the Sweep panel Sweep Table.

See Also `ATS.Sweep.Source.TableColumn`

ATS.Sweep.Spectrum Method

Syntax **`ATS.Sweep.Spectrum`**

Result Boolean

True	Change to Spectrum Display successful.
False	Display change not successful.

Description This command configures the Sweep Panel to produce a Spectrum display when a sweep is run.

New Test configuration functionality:

In this situation the user has not defined the Sweep Panel to display a Spectrum but has selected from one of the Digital Analyzer selections listed below. If the user has not selected from one of the Digital Analyzer selections listed below this command is not active.

When this command is executed default values are automaticaly entered into the sweep panel settings to setup the sweep to display the default Spectrum when run. Each Digital Analyzer selection listed below has it's own default sweep panel settings for a frequency domain display.

User defined test functionality:

In this situation the user has loaded a previously saved test. If the user has redefined any of the default sweep panel settings for any or all of the Digital Analyzer selections and then saved the settings as a test then all of the settings for all of the Digital Analyzer selections will be restored when the test is loaded. The user can then switch between any of the Digital Analyzer selections listed below and the prevoiusly defined settings will be restored.

Digital Analyzer selections:

FFT spectrum analyzer
INTERVU Digital interface analyzer
Multitone audio analyzer

See Also `ATS.Sweep.Waveform`

Example

```
Sub Main
  ATS.Application.NewTest
  ATS2.AGen.OutputOn = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS2.AnalogIn.Source(apbChB) = apbAnalogInGenMon
  ATS2.Inst.Selection = apbInstFFTAnalyzer
  ATS.Sweep.Spectrum
  ATS.Application.Page = 2
  ATS.Sweep.Start
  Wait 5
  ATS.Sweep.Waveform
End Sub
```

ATS.Sweep.Start — Method

Syntax **`ATS.Sweep.Start`**

Result Boolean

True	Sweep completed successfully.
False	Sweep terminated abnormally.

Description This command initiates a sweep.

Note: When using this command from an external application execution of additional commands will not be held off if the `ATS.Sweep.Repeat` command is set to True. The `ATS.Sweep.Repeat` command is also affected by the `ATS.Sweep.StartWithRepeat` commmand.

See Also `ATS.Sweep.StartWithAppend`, `ATS.Sweep.StartWithRepeat`

Example

```
Sub Main
```

```
    ATS.File.OpenTest("FRQ-RESP.ATS2")
    ATS.Sweep.Start
    ATS.File.SaveDataAs("FRQ-RESP.ATSA")
    ATS.File.OpenTest("THD-FRQ.ATS2")
    ATS.Sweep.Start
    ATS.File.SaveDataAs("THD-FRQ.ATSA")
    ATS.File.OpenTest("RESIDNOI.ATS2")
    ATS.Sweep.Start
    ATS.File.SaveDataAs("RESIDNOI.ATSA")
End Sub
```

ATS.Sweep.StartNoWait — Method

Syntax `ATS.Sweep.StartNoWait`

Result Boolean

True	Sweep process started successfully.
False	Sweep process not started successfully.

Description This command initiates a sweep process and then continues macro execution.

Example See example for `ATS.Sweep.Stop`.

ATS.Sweep.StartWithAppend — Method

Syntax `ATS.Sweep.StartWithAppend`

Description This command initiates a sweep in append mode which is equivalent to pressing the Ctrl+F9 function key.

See Also `ATS.Sweep.Start, ATS.Sweep.StartWithRepeat`

Example See example for `ATS.Sweep.SinglePoint`.

ATS.Sweep.StartWithRepeat — Method

Syntax `ATS.Sweep.StartWithRepeat`

Description This command initiates a sweep in repeat mode which is equivalent to pressing the Alt+F9 function key.

See Also `ATS.Sweep.Start, ATS.Sweep.StartWithAppend`

Example See example for `ATS.Sweep.Repeat`.

ATS.Sweep.Stereo — Property

Syntax `ATS.Sweep.Stereo`

Data Type Boolean

True	Enable Stereo Sweep
False	Disable Stereo Sweep.

Description This command enables or disables the stereo sweep feature on the Sweep panel.

Example See example for `ATS.Sweep.SinglePoint`.

ATS.Sweep.Stop — Method

Syntax `ATS.Sweep.Stop`

Result Boolean

True	Sweep terminated successfully.
False	Sweep not terminated.

Description This command terminates a running sweep.

See Also `ATS.Sweep.IsRunning`

Example

```
Dim Halt As Boolean
Sub Main
  Halt = False
```

```
   ATS.Application.NewTest
   ATS2.AGen.OutputOn = True
   ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
   ATS.Sweep.Source1.Steps = 200
   ATS.Application.SetWatchDogTimer(1, 5.0, False)
   ATS.Sweep.StartNoWait
   Do
      'nothing
   Loop While Halt = False
End Sub
Public Sub ATSEvent_OnWatchDogTimeout _
   (ByVal Id As Long)
   If Id = 1 Then
      Halt = True
      If ATS.Sweep.IsRunning = True Then
         ATS.Sweep.Stop
         Debug.Print "Sweep Stopped"
      End If
   End If
End Sub
```

ATS.Sweep.Timeout — Property

Syntax `ATS.Sweep.Timeout(ByVal Unit As String)`

Data Type Double — Timeout values of 0 to 3000 seconds (50 minutes) are allowed.

Parameter

Name	Description
Unit	Sec unit only.

Description This command sets the timeout used during settling comparisons. If settling cannot be achieved during the Timeout duration, the average of its last 6 readings is computed and returned. Timeout serves as a "safety valve" to avoid excessive delays or hang-up when the data has more variation that present settling parameters will accept.

In a graph display, each timeout point is indicated by a white T at the upper margin of the graph, directly above the plotted point. In the Data Editor, each timeout point is indicated by the letter T following

the data. In the Log File, the Pass/Fail message (if enabled) shows the total number of timeouts which occurred during a sweep. However, a timeout is not treated as a failure if the eventual averaged data was within limits. The Log File may also includes a line for each measured point which timed out durring the sweep resulting in a row showing the measured value and a letter T.

See Appendix A for Settling Algorithm and parameter name descriptions.

Example See example for `ATS.Sweep.SinglePoint`.

ATS.Sweep.Waveform Method

Syntax **`ATS.Sweep.Waveform`**

Result Boolean

`True`	Change to Waveform Display successful.
`False`	Display change not successful.

Description This command configures the Sweep Panel to produce a Waveform display when a sweep is run.

New Test configuration functionality:

In this situation the user has not defined the Sweep Panel to display a Waveform but has selected from one of the Digital Analyzer selections listed below. If the user has not selected from one of the Digital Analyzer selections listed below this command is not active.

When this command is executed default values are automaticaly entered into the sweep panel settings to setup the sweep to display the default Waveform when run. Each Digital Analyzer selection listed below has it's own default sweep panel settings for a time domain display.

User defined test functionality:

In this situation the user has loaded a previously saved test. If the user has redefined any of the default sweep panel settings for any or all of the Digital Analyzer selections and then saved the settings as a

test then all of the settings for all of the Digital Analyzer selections will be restored when the test is loaded. The user can then switch between any of the Digital Analyzer selections listed below and the prevoiusly defined settings will be restored.

Digital Analyzer selections:

FFT spectrum analyzer
INTERVU Digital interface analyzer
FASTTEST Multitone audio analyzer

See Also `ATS.Sweep.Spectrum`

Example See example for `ATS.Sweep.Spectrum`.

Chapter 18

Analog Generator

ATS2.AGen.Ampl — Property

Syntax **ATS2.AGen.Ampl(**ByVal *Channel* As Constant, ByVal *Unit* As String**)**

Data Type Double

Parameter

Name	Description
Channel	apbChA = Channel A apbChB = Channel B
Unit	String that designates the desired unit. The following units are valid for this command: Vrms, Vp, Vpp, dBu, dBV, dBr, W, dBrInv

Description This command sets the Analog Generator amplitude.

Example

```
Sub Main
  Dim reading(30)
  ndx = 0
  ATS.Application.NewTest
  ATS2.AGen.OutputOn = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS2.AGen.Ampl(apbChA, "Vrms") = 5
  For NewFreq = 20 To 20e3 Step (20e3 - 20)/30
     ATS2.AGen.Freq(apbChA, "Hz") = NewFreq
     reading(ndx) = ATS2.Inst.Analyzer.FuncRdg _
        (apbChA, "V")
     ndx = ndx + 1
  Next
End Sub
```

ATS2.AGen.AutoOn Property

Syntax `ATS2.AGen.AutoOn`

Data Type Boolean

True	ON, Auto On feature active.
False	OFF, Auto On feature disabled.

Description This command enables the Auto On feature for the Analog Generator. Auto On switches the generator output ON when a sweep starts, and OFF when a sweep terminates.

ATS2.AGen.BurstInterval Property

Syntax `ATS2.AGen.BurstInterval(ByVal Unit As String)`

Data Type Double — 2 - 65536 cycles or equivalent period based on sine waveform frequency.

Parameter

Name	Description
Unit	String that designates the desired unit. The following units are valid for this command: Cycles, sec

Description This command sets the number of cycles between the start of a burst and the start of the following burst. This number may be from 2 to 65535 cycles and must be greater than the number of ON cycles. If the number of cycles attempted is not greater than the ON cycles, the interval is not changed.

Note that the interval will occur immediately when this command is called if the burst is running.

See Also `ATS2.AGen.Wfm, ATS2.AGen.BurstLevel, ATS2.AGen.BurstOnTime`

Example

```
Sub Main
  ATS.Application.NewTest
  ATS2.AGen.Wfm.Sine.ShapedBurst
  ATS2.AGen.OutputOn = True
  ATS2.AGen.BurstInterval("Cycles") = 10
  ATS2.AGen.BurstOnTime("Cycles") = 5
```

```
    ATS2.AGen.BurstLevel("dB") = -40
    Interval = ATS2.AGen.BurstInterval("Cycles")
    Ontime = ATS2.AGen.BurstOnTime("Cycles")
    Level = ATS2.AGen.BurstLevel("%")
    Debug.Print "Burst Interval =";Interval;" cycles."
    Debug.Print "Burst ON time =";Ontime;" cycles."
    Debug.Print "Burst OFF time low level =";Level;"
%."
End Sub
```

Output

```
Burst Interval = 10 cycles.
Burst ON time = 5 cycles.
Burst OFF time low level = 1 %.
```

ATS2.AGen.BurstLevel — Property

Syntax **ATS2.AGen.BurstLevel(**ByVal *Unit* As String**)**

Data Type Double — Level of signal during burst off time. (0 - -80.25dB)

Parameter

Name	Description
Unit	The following units are available X/Y, dB, %, PPM.

Description This command sets the amplitude of the Analog Generator during the burst 'OFF' time. This is as a percentage of the 'ON' amplitude and may range from 100.0 percent to .009716280 percent (-80.25 dB).

See Also ATS2.AGen.Wfm, ATS2.AGen.BurstInterval, ATS2.AGen.BurstOnTime

Example See example for ATS2.AGen.BurstInterval.

ATS2.AGen.BurstOnTime — Property

Syntax **ATS2.AGen.BurstOnTime(**ByVal *Unit* As String**)**

Data Type Double — From 1 to ATS2.AGen.BurstInterval - 1.

Parameter	Name	Description
	Unit	String that designates the desired unit. The following units are valid for this command: Cycles, sec

Description This command sets the number of cycles for the Analog Generator Burst On Time. This number may be from 1 to 65534 cycles and must be less than the number of interval cycles. If the number of cycles attempted is not less than the interval cycles, the ON time is not changed.

See Also `ATS2.AGen.Wfm, ATS2.AGen.BurstInterval, ATS2.AGen.BurstLevel`

Example See example for `ATS2.AGen.BurstInterval`.

ATS2.AGen.ChBTrackA — Property

Syntax **`ATS2.AGen.ChBTrackA`**

Data Type Boolean

True	ON, channel B amplitude tracks channel A amplitude.
False	OFF, channel B amplitude independent of channel A.

Description This command sets channel "B" amplitude to the same amplitude as set for channel "A".

Example

```
Sub Main
  ATS.Application.NewTest
  ATS2.AGen.Output(apbChA) = True
  ATS2.AGen.Output(apbChB) = True
  ATS2.AGen.Ampl(apbChA, "Vrms") = 1
  ATS2.AGen.ChBTrackA = True
  ATS2.AGen.OutputOn = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS2.AnalogIn.Source(apbChB) = apbAnalogInGenMon
  ATS.Anlr.LevelSettling(apbChA, 1, .000025, "V", 3,
.03, apbExponential)
  ATS.Anlr.LevelSettling(apbChB, 1, .000025, "V", 3,
.03, apbExponential)
  ATS2.Inst.Analyzer.LevelTrig(apbChA)
```

```
   ATS2.Inst.Analyzer.LevelTrig(apbChB)
   Do
      ReadyA = ATS2.Inst.Analyzer.LevelReady(apbChA)
      ReadyB = ATS2.Inst.Analyzer.LevelReady(apbChB)
   Loop Until ReadyA > 0 And ReadyB > 0
   ReadingA = ATS2.Inst.Analyzer.LevelRdg(apbChA, "V")
   ReadingB = ATS2.Inst.Analyzer.LevelRdg(apbChB, "V")
   Debug.Print "Level A amplitude = "; _
   Format(ReadingA,"#.0000");" V"
   Debug.Print "Level B amplitude = "; _
   Format(ReadingB,"#.0000");" V"
End Sub
```

Output

```
Level A amplitude = .9970 V
Level B amplitude = .9995 V
```

ATS2.AGen.Config — Property

Syntax **`ATS2.AGen.Config`**

Data Type Constant

`apbAGenBal`
: `Bal XLR`

`apbAGenUnBal`
: Unbal BNC/XLR

`apbAGenCMTST`
: CMTST XLR

Description This command sets both outputs to a balanced or unbalanced configuration.

Note that the output impedance may change between balanced and unbalanced.

It is possible for this command to cause an amplitude error since the maximum allowable amplitude in the unbalanced configurations is half that for the balanced configuration.

This command sets both outputs to a common mode test configuration.

See Also ATS2.AGen.Impedance

Example

```
Sub Main
   ATS.Application.NewTest
   ATS2.AGen.Config = apbAGenBal
   ATS2.AGen.Impedance = apbAgenLowZ
   ATS2.AGen.Ampl(apbChA, "Vrms") = 2.0
   ATS2.AGen.OutputOn = True
   ATS2.Inst.Analyzer.RangeAuto(apbChB) = False
   ATS2.AnalogIn.Range(apbChA, "Vp") = 2.8
   ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
   ATS2.Inst.Analyzer.Analyzer.FuncSettling(apbChA, _
      1, .000002, "V", 4, .05, apbExponential)
   ATS2.Inst.Analyzer.FuncTrig(apbChA)
   Do
      Ready = ATS2.Inst.Analyzer.FuncReady(apbChA)
   Loop Until Ready > 0
   Rdg = ATS2.Inst.Analyzer.FuncRdg(apbChA, "V")
   Debug.Print "Channel A Amplitude = ";Format _
      (Rdg, "#.0000");" V"
   ATS2.Inst.Analyzer.RangeAuto(apbChA) = True
End Sub
```

Output

```
Channel A Amplitude = 1.9997 V
```

ATS2.AGen.DACSampleRate — Property

Syntax **ATS2.AGen.DACSampleRate**

Data Type Constant

apbAGenSR_65536
: 65536

apbAGenSR_131072
: 131072

apbAGenSR_OSR
: OSR (Output Sample Rate)

apbAGenSR_ISR
: ISR (Input Sample Rate)

Description This command sets the Digital to Analog converter sample rate for the Arb Wfm waveform selected with the `ATS2.AGen.Wfm` command.

See Also `ATS2.AGen.Wfm`

ATS2.AGen.DualAmplRatio Property

Syntax **`ATS2.AGen.DualAmplRatio(`**`ByVal` *`Unit`* `As String`**`)`**

Data Type Double — Valid settings are 0.00001% to 100%

Parameter

Name	Description
`Unit`	String that designates the desired unit. The following units are valid for this command: %, dB, PPM, X/Y

Description This command sets the Analog Generator amplitude ratio to be used with the channel A and B waveforms for the Sine Dual waveform selection.

See Also `ATS2.AGen.Freq`

ATS2.AGen.EqAmpl Property

Syntax **`ATS2.AGen.EqAmpl(`**`ByVal` *`Channel`* `As Constant, ByVal` *`Unit`* `As String`**`)`**

Data Type Double — Valid amplitude settings are 0.0 to 100 %FS.

Parameter

Name	Description
`Channel`	apbChA = Channel A apbChB = Channel B
`Unit`	String that designates the desired unit. The following units are valid for this command: FFS, %FS, dBFS, PPM, Bits, Vrms, Vp, Vpp, dBu, dBV, dBr

Description This command sets the Analog Generator post Eq amplitude.

See Also `ATS2.AGen.EqCurve`

Example

```
Sub Main
```

```
  ATS.Application.NewTest
  ATS2.AGen.EqCurve("75US-PRE.ATSQ", 1)
  ATS2.AGen.Wfm.Sine.EQ
  ATS2.AGen.EqAmpl(apbChA, "dBV") = -10.0
  ATS2.AGen.OutputOn = True
  ATS.Sweep.Data(1).Top("dBV") = 12.0
  ATS.Sweep.Data(1).Bottom("dBV") = -12.0
  ATS.Sweep.Stereo = True
  ATS.Sweep.Start
End Sub
```

ATS2.AGen.EqCurve — Method

Syntax `ATS2.AGen.EqCurve(ByVal FileName As String, ByVal Column As Integer)`

Data Type Boolean

Parameter

Name	Description
FileName	Long Path and File Names permitted up to 128 characters. The file must be an ATS Eq file (.atsq).
Column	0 = Source 1 settings. 1 = Data 1 measurements. 2 = Data 2 measurements. 3 = Data 3 measurements. 4 = Data 4 measurements. 5 = Data 5 measurements. 6 = Data 6 measurements. 7 = Source 2 settings.

Description This command attaches a Eq file to the Analog Generator. Values in the file will be used as multiply factors in calculating the Analog Generator Amplitude value.

Example See example for `ATS2.AGen.EqAmpl`.

ATS2.AGen.EqCurveColumn — Get Only Property

Syntax `ATS2.AGen.EqCurveColumn(ByVal Data As Integer)`

Data Type Integer Column number.

Parameter	Name	Description
	Data	Number of the Sweep Data (1-6) of the data in memory.

Description This command returns the column number in the attached file used in the Analog Generator EqCurve waveform selection.

See Also `ATS2.AGen.EqCurve, ATS2.AGen.EqCurveFilename`

ATS2.AGen.EqCurveFilename — Get Only Property

Syntax **`ATS2.AGen.EqCurveFilename`**

Data Type Integer Any valid DOS filename and extension.

Description This command returns the File Name of the attached file used for the Analog Generator EqCurve waveform selection.

See Also `ATS2.AGen.EqCurve, ATS2.AGen.EqCurveColumn`

ATS2.AGen.Freq — Property

Syntax **`ATS2.AGen.Freq(`**`ByVal` *`Channel`* `As String, ByVal` *`Unit`* `As String`**`)`**

Data Type Double Valid frequency settings for the Hz unit and sine waveform are 2.0 - 61.665 kHz.

Parameter	Name	Description
	Channel	apbFreq1 = Sets the Frequency (Primary) for all Sine, Square, and Special waveform selections. apbFreq2 = Sets Frequency 2 (Secondary) for the Sine Stereo and Dual waveforms.
	Unit	String that designates the desired unit. The following units are valid for this command: Hz, F/R, dHz, %Hz, cent, octs, decs, d%, dPPM

Description This command sets the Analog Generator Frequency.

Example

```
Sub Main
```

```
   ATS.Application.NewTest
   ATS2.AGen.Wfm.sine.Stereo
   ATS2.AGen.Outputs = True
   ATS2.AGen.Freq(apbFreq1,"Hz") = 1000.0
   ATS2.AGen.Freq(apbFreq2,"Hz") = 2000.0
   ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
   ATS2.AnalogIn.Source(apbChB) = apbAnalogInGenMon
   ATS2.Inst.Analyzer.FreqSettling(apbChA, .5, _
      .0002, "Hz", 3, .03, apbExponential)
   ATS2.Inst.Analyzer.FreqSettling(apbChB, .5, _
      .0002, "Hz", 3, .03, apbExponential)
   ATS2.Inst.Analyzer.FreqTrig(apbChA)
   ATS2.Inst.Analyzer.FreqTrig(apbChB)
   Do
      AReady = ATS2.Inst.Analyzer.FreqReady(apbChA)
      BReady = ATS2.Inst.Analyzer.FreqReady(apbChB)
   Loop Until AReady > 0 And BReady > 0
   AReading = ATS2.Inst.Analyzer.FreqRdg(apbChA, "Hz")
   BReading = ATS2.Inst.Analyzer.FreqRdg(apbChB, "Hz")
   Debug.Print "Channel A Frequency = " & _
      Format(AReading, "#.00") & " Hz"
   Debug.Print "Channel B Frequency = " & _
      Format(BReading, "#.00") & " Hz"
End Sub
```

Output

```
Channel A Frequency = 1000.00 Hz
Channel B Frequency = 2000.00 Hz
```

ATS2.AGen.IMFreq — Property

Syntax **ATS2.AGen.IMFreq(**ByVal *Unit* As String**)**

Data Type Double — Frequencies from 40 Hz to 500 Hz are available.

Parameter

Name	Description
Unit	String that designates the desired unit. The following unit is valid for this command. Hz

Description This command sets the Analog Generator IMD lower frequency tone.

Set the generator to an IMD waveform before calling this command in order to have the proper IMD frequency selected.

See Also `ATS2.AGen.Wfm, ATS2.AGen.IMHighFreq`

Example

```
Sub Main
   ATS.Application.NewTest
   ATS2.AGen.Wfm.IMD.SMPTE
   ATS2.AGen.IMHighFreq("Hz") = 7000
   ATS2.AGen.IMFreq("Hz") = 60
   ATS2.AGen.Ampl("dBu") = 0.0
   ATS2.AGen.OutputOn = True
   ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
   ATS2.Inst.Analyzer.FuncMode = apbAnlrSMPTE
   ATS2.Inst.Analyzer.FuncSettling(apbChA, 3, _
      0.00003, "%", 3, .05, apbExponential)
   ATS2.Inst.Analyzer.FuncTrig(apbChA)
   Do
      Ready = ATS2.Inst.Analyzer.FuncReady(apbChA)
      Loop Until Ready > 0
   Reading1 = ATS2.Inst.Analyzer.FuncRdg(apbChA, "%")
   Debug.Print "SMPTE 4:1 = " & Format(Reading1, _
      "#.0000") & " %"
End Sub
```

Output

```
SMPTE 4:1 = .0010 %
```

ATS2.AGen.IMHighFreq — Property

Syntax **`ATS2.AGen.IMHighFreq(`**`ByVal` *`Unit`* `As String`**`)`**

Data Type Double

Parameter

Name	Description
Unit	String that designates the desired unit. The following unit is valid for this command. Hz

Description This command sets the Analog Generator IMD High Frequency. The frequency passed is rounded to the closest available value.

Set the Analog Generator waveform to an IMD before calling this command.

See Also `ATS2.AGen.IMFreq`

Example `See example for ATS2.AGen.IMFreq.`

ATS2.AGen.Impedance — Property

Syntax **`ATS2.AGen.Impedance`**

Data Type Integer

The following list contains the selections relevant to the `ATS2.AGen.Config` command for the Balanced and CMTST selections.

`apbAgenLowZ`
40

`apbAGenHighZ`
150 Ohms standard, 200 Ohms for EURZ option, 600 Ohms for 600Z option.

The following list contains the selections relevant to the `ATS2.AGen.Config` command for the Un-Balanced selections.

`apbAGenLowZ`
20

`apbAGenHighZ`
50

Description This command controls the output impedance for Balanced and Un-Balanced generator output configurations.

See Also `ATS2.AGen.Config`

ATS2.AGen.Output — Property

Syntax **`ATS2.AGen.Output(`**`ByVal` *`Channel`* `As Constant)`

Data Type Boolean

`True` On

	False	Off

Parameter	Name	Description
	Channel	apbChA = Channel A apbChB = Channel B

Description This command sets the Analog Generator specified channel output to ON or OFF.

See Also `ATS2.AGen.OutputOn`

Example See example for `ATS2.AGen.Ampl`.

ATS2.AGen.OutputOn Property

Syntax **`ATS2.AGen.OutputOn`**

Data Type Boolean

True	On
False	Off

Description This command sets the Analog Generator channel A and B outputs to ON or OFF if they have been individually enabled by the `ATS2.AGen.Output` command.

See Also `ATS2.AGen.Output`

Example See example for `ATS2.AGen.Ampl`.

ATS2.AGen.Phase Property

Syntax **`ATS2.AGen.Phase(`**`ByVal` *`Unit`* `As String`**`)`**

Data Type Double

Parameter	Name	Description
	Unit	String that designates the desired unit. The following units are valid for this command: deg

Description This command sets the Analog Generator Phase value.

Set the Analog Generator waveform to Sine Var Phase before calling this command.

Example

```
Sub Main
   ATS.Application.NewTest
   ATS2.AGen.Wfm.Sine.VarPhase
   ATS2.AGen.Phase("deg") = 90.0
   ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
   ATS2.AnalogIn.Source(apbChB) = apbAnalogInGenMon
   ATS2.AGen.OutputOn = True|
   ATS2.Inst.Analyzer.FuncMode = apbAnlrPhase
   ATS2.Inst.Analyzer.FuncSettling(apbChA, 0.0, _
      0.2, "deg", 2, 0.02, apbFlat)
   ATS2.Inst.Analyzer.FuncTrig(apbChA)
   Do
      Ready = ATS2.Inst.Analyzer.FuncReady(apbChA)
   Loop Until Ready > 0
   Reading1 = ATS2.Inst.Analyzer.FuncRdg(apbChA,"deg")
   Debug.Print "Channel B is " & Format(Reading1, _
      "##.000") & " deg relative to channel A."
End Sub
```

Output

```
Channel B is 89.984 deg relative to channel A.
```

ATS2.AGen.RefdBm — Property

Syntax **ATS2.AGen.RefdBm(**ByVal *Unit* As String**)**

Data Type Double — Impedance value.

Parameter

Name	Description
Unit	Ohms only.

Description This command sets the value known to be the generator load impedance for use in dBm computations. When a value of generator output amplitude is requested via the AP.AGen.Ampl command using the dBm unit, the software uses this dBm reference impedance value as the "R" in the V2/R power computation and sets the generator open-circuit voltage commensurately with the voltage division ratio of

the present generator source impedance and the specified load impedance in order to deliver the specified dBm value to the load.

Example

```
Sub Main
   ATS.Application.NewTest
   ATS2.AGen.Output(apbChB) = False
   ATS2.AGen.Impedance = 2
   ATS2.AGen.RefdBm("Ohms") = 600
   ATS2.AGen.Ampl("dBm") = 0.0
   ATS2.AGen.OutputOn = True
   ATS2.AnalogIn.Impedance(apbChA) = 1
   ATS2.Inst.RefdBm("Ohms") = 600
   Reference = ATS2.Inst.RefdBm("Ohms")
   ATS2.Inst.Analyzer.FuncSettling(1, .000002, _
      "V", 4, .05, 1)
   ATS2.Inst.Analyzer.FuncTrig
   Do
      Ready = ATS2.Inst.Analyzer.FuncReady
   Loop Until Ready > 0
   Reading1 = ATS2.Inst.Analyzer.FuncRdg("dBm")
   Debug.Print "Channel A Amplitude = ";Format _
      (Reading1, "#.0000");" dBm (";Reference; _
      " Ohms )"
End Sub
```

Output

```
Channel A Amplitude = -.0063 dBm ( 600 Ohms )
```

ATS2.AGen.RefdBr — Property

Syntax **ATS2.AGen.RefdBr(**ByVal *Unit* As String**)**

Data Type Double — Amplitude value.

Parameter

Name	Description
Unit	String that designates the desired unit. The following units are valid for this command: V, dBu, dBV

Description This command sets the zero dBr value for the Analog Generator dBr units.

Example

```
Sub Main
```

```
   ATS.Application.NewTest
   ATS2.AGen.RefdBr("V") = 1
   ATS2.AGen.Ampl(apbChA, "dBr") = 1
   ATS2.AGen.OutputOn = True
   ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
   ATS2.Inst.Analyzer.RefdBr(apbChA, "V") = 1
   Reference = ATS2.AGen.RefdBr("V")
   ATS2.Inst.Analyzer.LevelSettling(apbChA, 1, _
      .000002, "V", 4, .05, apbExponential)
   ATS2.Inst.Analyzer.LevelTrig(apbChA)
   Do
      Ready = ATS2.Inst.Analyzer.LevelReady(apbChA)
   Loop Until (Ready > 0)
   Reading1 = ATS2.Inst.Analyzer.LevelRdg(apbChA, _
      "dBr A")
   Debug.Print "Channel A Amplitude = ";Format _
      (Reading1, "#.0000");" dBr relative to"; _
      Reference;" Volts"
End Sub
```

Output

```
Channel A Amplitude = .9679 dBr relative to 1 Volts
```

ATS2.AGen.RefdBrAuto — Method

Syntax **ATS2.AGen.RefdBrAuto**

Result Boolean

True	dBr reference set.
False	dBr reference not set.

Description This command sets the generator dBr reference field to the current generator Amplitude setting. If the command is successful a boolean True is returned. If the command is not successful a boolean False is returned.

Example

```
Sub Main
   ATS.Application.NewTest
   ATS2.AGen.Ampl(apbChA, "dBV") = 0
   ATS2.AGen.RefdBrAuto
   'Increase amplitude 2 dB.
```

```
   ATS2.AGen.Ampl(apbChA, "dbr") = 2
   ATS2.AGen.OutputOn = True
   ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
   ATS2.Inst.Analyzer.FuncMode = apbAnlrAmplitude
   ATS2.Inst.Analyzer.FuncSettling(apbChA, 1, _
      .000002, "V", 4, .05, apbExponential)
   ATS2.Inst.Analyzer.FuncTrig(apbChA)
   Do
      Ready = ATS2.Inst.Analyzer.FuncReady(apbChA)
   Loop Until Ready > 0
   Reading1 = ATS2.Inst.Analyzer.FuncRdg(apbChA,
"dBV")
   Debug.Print "Channel A Amplitude =";Format$ _
      (Reading1,"#.000000");" dBV"
End Sub
```

Output

```
Channel A Amplitude = 1.974047 dBV
```

ATS2.AGen.RefFreq — Property

Syntax **ATS2.AGen.RefFreq(**ByVal *Unit* As String**)**

Data Type Double

Parameter

Name	Description
Unit	String that designates the desired unit. The following unit is valid for this command: Hz

Description This command sets the Analog Generator relative frequency reference value. This reference is used for all the Analog Generator relative frequency units (F/R, dHz, %Hz, cent, octs, decs, d%, dPPM)

See Also ATS2.AGen.Freq

Example

```
Sub Main
   ATS.Application.NewTest
   ATS2.AGen.OutputOn = True
   ATS2.AGen.RefFreq("Hz") = 5000
   ATS2.AGen.Freq(apbChA, "dHz") = 5000
   ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
   ATS2.Inst.Analyzer.FreqSettling(apbChA, .5, _
```

```
      .0002, "Hz", 3, .03, apbExponential)
   ATS2.Inst.Analyzer.FreqTrig(apbChA)
   Do
      Ready = ATS2.Inst.Analyzer.FreqReady(apbChA)
   Loop Until Ready > 0
   Reading1 = ATS2.Inst.Analyzer.FreqRdg(apbChA, "Hz")
   Debug.Print "Frequency A = " & Format(Reading1, _
      "#.0000") & " Hz"
End Sub
```

Output

```
Frequency A = 9996.5878 Hz
```

ATS2.AGen.RefFreqAuto — Method

Syntax **`ATS2.AGen.RefFreqAuto`**

Result Boolean

True	Frequency reference set.
False	Frequency reference not set.

Description This command sets the generator frequency reference field to the current generator frequency setting. If the command is successful a boolean True is returned. If the command is not successful a boolean False is returned.

Example

```
Sub Main
   ATS.Application.NewTest
   ATS2.AGen.OutputOn = True
   ATS2.AGen.RefFreqAuto
   ATS2.AGen.Freq(apbFreq1, "dHz") = 2000
   ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
   ATS2.Inst.Analyzer.FreqSettling(apbChA, .5, _
      0.0002, "Hz", 3, .03, apbExponential)
   ATS2.Inst.Analyzer.FreqTrig(apbChA)
   Do
      Ready = ATS2.Inst.Analyzer.FreqReady(apbChA)
   Loop Until Ready > 0
   Reading1 = ATS2.Inst.Analyzer.FreqRdg(apbChA, "Hz")
   Debug.Print "Frequency A =" & _
      Format$(Reading1,"#.00") & " Hz"
```

```
End Sub
```

Output

```
Frequency A = 3000.00 Hz
```

ATS2.AGen.RefWatts — Property

Syntax **ATS2.AGen.RefWatts(**ByVal *Unit* As String**)**

Data Type Double — Impedance value.

Parameter

Name	Description
Unit	Ohms only.

Description This command sets the value known to be the generator load impedance for use in Watts computations. When a value of generator output amplitude is requested via the `ATS2.AGen.Ampl` command using the Watts unit, the software uses this Watts reference impedance value as the "R" in the V2/R power computation and sets the generator open-circuit voltage commensurately with the voltage division ratio of the present generator source impedance and the specified load impedance in order to deliver the specified power value to the load.

Example

```
Sub Main
  ATS.Application.NewTest
  ATS2.AGen.OutputOn = True
  ATS2.AGen.RefWatts("Ohms") = 8
  ATS2.AGen.Ampl(apbChA, "W") = .1
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS2.Inst.Analyzer.RefWatts("Ohms") = 8
  ATS2.Inst.Analyzer.FuncSettling(apbChA, 1, _
     .000002, "V", 4, .05, apbExponential)
  ATS.Anlr.FuncTrig(apbChA)
  Do
     Ready = ATS2.Inst.Analyzer.FuncReady(apbChA)
  Loop Until Ready > 0
  Reading1 = ATS2.Inst.Analyzer.FuncRdg(apbChA, "W")
  Debug.Print "Output Power = " & _
     Format$(Reading1,"#.0000") & " Watts"
End Sub
```

Output

```
Output Power = 3.5797 Watts
```

ATS2.AGen.Wfm

Method

Syntax **ATS2.AGen.Wfm.** *Primary.Secondary*

Parameter

Name	Description
Primary	This part defines the basic waveform type.
Secondary	This part defines the basic waveform modifier.

Primary	Secondary	Description
.Sine	.Normal	Sine Normal
	1	Var Phase
	2	Stereo
	3	Dual
	4	Shaped Burst
	5	EQ Sine
.IMD	.SMPTE_4_1	SMPTE/DIN 4:1
	.SMPTE_1_1	SMPTE/DIN 1:1
.Square		Square
.Noise		Noise
.Arbitrary		Arb Wfm
.Special	.Polarity	Polarity
	.PassThru	Pass Thru

Description This command selects the Analog Generator waveform. The table above shows the possible settings for the `ATS2.AGen.Wfm` command.

Example

```
Sub Main
  ATS.Application.NewTest
  ATS2.AGen.Wfm.Arbitrary
  ATS2.AGen.WfmName = "48kSine996-0dB.agm"
  ATS2.AGen.Ampl(apbChA, "Vrms") = 2.0
  ATS2.AGen.OutputOn = True
```

```
   ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
   ATS2.AnalogIn.Source(apbChB) = apbAnalogInGenMon
   ATS2.AnalogIn.SampleRate = apbAnalogInHIRES_OSR
   ATS2.Inst.Selection = apbInstHarmonicAnalyzer

   With ATS2.Inst.Harmonic
      .InputFormat = apbInstInAnalog
      .AmplTrig(apbChA)
      .FreqTrig(apbChA)
      Do
      Loop Until .AmplReady(apbChA) _
         And .FreqReady(apbChA)
      var1 = .AmplRdg(apbChA, "V")
      var2 = .FreqRdg(apbChA, "Hz")
   End With
   Text1$= "Channel A Fundamental Amplitude " _
      & Str$(Format(var1, "##.000")) & "V"
   Text2$= "Channel A Fundamental Frequency " _
      & Str$(Format(var2, "##.000")) & "Hz"
   ATS.Prompt.Text = Text1$ & vbCr & Text2$
   ATS.Prompt.ShowWithContinue
End Sub
```

ATS2.AGen.WfmName — Property

Syntax **`ATS2.AGen.WfmName`**

Data Type String — Long Path and File Names permitted up to 128 characters.

Description This command loads the designated arbitrary waveform file (.AGM or .AGS) into the Analog Generator. The file must be an ATS waveform file (.agm or .ags).

Note: If the Digital Generator waveform selection is set to Arbitrary then this command will also change the Arbitrary waveform for the Digital Generator.

See Also `ATS2.AGen.Wfm`

Chapter 19

Analog Input

ATS2.AnalogIn.DCCoupled — Property

Syntax **ATS2.AnalogIn.DCCoupled(**ByVal *Channel* As Constant**)**

Data Type Boolean

True	DC Coupled
False	Not DC Coupled

Parameter

Name	Description
Channel	apbChA = Channel A apbChB = Channel B

Description This command sets the specified channel Input Coupling. This enables the ATS-2 to DC couple the input to the Analyzer for improved CMRR at low frequencies and increased low frequency measurement capability. By DC coupling the Analog Input DC Volts can also be measured.

Example

```
Sub Main
  ATS.Application.NewTest
  ATS2.AGen.OutputOn = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS2.AnalogIn.Source(apbChB) = apbAnalogInGenMon
  ATS2.AnalogIn.DCCoupled(apbChA) = True
  ATS2.AnalogIn.DCCoupled(apbChB) = True
  ATS2.AnalogIn.PeakTrig(apbChA)
  ATS2.AnalogIn.PeakTrig(apbChB)
  Do
     AReady = ATS2.AnalogIn.PeakReady(apbChA)
     BReady = ATS2.AnalogIn.PeakReady(apbChB)
  Loop Until AReady > 0 And BReady > 0
  AReading = ATS2.AnalogIn.PeakRdg(apbChA, "Vp")
```

```
   BReading = ATS2.AnalogIn.PeakRdg(apbChB, "Vp")
   Debug.Print "Channel A Peak Level = " _
      & Format(AReading, "#.0000") & " Vp"
   Debug.Print "Channel B Peak Level = " _
      & Format(BReading, "#.0000") & " Vp"
End Sub
```

Output

```
Channel A Peak Level = 1.414 Vp
Channel B Peak Level = 1.414 Vp
```

ATS2.AnalogIn.Impedance — Property

Syntax `ATS2.AnalogIn.Impedance(ByVal Channel As Constant)`

Data Type Constant

apbInputLowZ

100k Ohms standard, 600 Ohms for 600Z option.

apbInputHighZ

100k

Parameter

Name	Description
Channel	apbChA = Channel A apbChB = Channel B

Description This command selects one of the available termination impedances for the Analyzer Input.

Example See example for ATS2.Inst.RefdBm.

ATS2.AnalogIn.PeakRdg — Property

Syntax `ATS2.AnalogIn.PeakRdg(ByVal Channel As Constant, ByVal Unit As String)`

Data Type Double

Parameter	Name	Description
	Channel	apbChA = Select channel A apbChB = Select channel B
	Unit	The following unit is available: Vp

Description This command returns a unsettled reading for the Analog Input Peak meter and zeros the ready count.

See Also `ATS2.AnalogIn.PeakReady, ATS2.AnalogIn.PeakTrig`

Example See example for `ATS2.AnalogIn.DCCoupled`.

ATS2.AnalogIn.PeakReady Property

Syntax **`ATS2.AnalogIn.PeakReady(`**`ByVal` *`Channel`* `As Constant`**`)`**

Data Type Integer

0	Reading not ready.
>0	Reading ready.

Parameter	Name	Description
	Channel	apbChA = Select channel A apbChB = Select channel B

Description This command returns the Analog Input Peak meter unsettled reading ready count.

Because readings do not return until a reading is ready, this command may be used to avoid waiting for a reading. This command does NOT zero the ready count and so may be called any number of times. Only a call to the `ATS2.AnalogIn.PeakRdg` or `ATS2.AnalogIn.PeakTrig` commands will zero the ready count.

If the reading is found to be ready, a call to the `ATS2.AnalogIn.FreqRdg` command will be guaranteed to return quickly.

See Also `ATS2.AnalogIn.PeakRdg, ATS2.AnalogIn.PeakTrig`

Example See example for `ATS2.AnalogIn.DCCoupled`.

ATS2.AnalogIn.PeakTrig — Method

Syntax `ATS2.AnalogIn.PeakTrig(ByVal Channel As Constant)`

Parameter

Name	Description
Channel	apbChA = Select channel A apbChB = Select channel B

Description Causes a restart of the reading cycle and zeros the ready count for the `ATS2.AnalogIn.PeakRdg` command. The reading in progress is aborted.

See Also `ATS2.AnalogIn.PeakRdg, ATS2.AnalogIn.PeakReady`

Example See example for `ATS2.AnalogIn.DCCoupled`.

ATS2.AnalogIn.Range — Property

Syntax `ATS2.AnalogIn.Range(ByVal Channel As Constant, ByVal Unit As String)`

Data Type Double — The following values are the range boundaries for the "dBV" unit: 42.095, 36.075, 30.054, 23.995, 17.974, 11.953, 5.933, -0.088, -5.985, -12.006

Parameter

Name	Description
Channel	apbChA = Channel A apbChB = Channel B
Unit	The following units are available: Vp, dBu, dBV

Description This command sets the Analog Input Range and returns the nominal full scale of the range in use.

See Also `ATS2.AnalogIn.RangeAuto`

ATS2.AnalogIn.RangeAuto — Property

Syntax `ATS2.AnalogIn.RangeAuto(ByVal Channel As Constant)`

Data Type Boolean

True	Auto range
False	Fixed range

Parameter	**Name**	**Description**
	Channel	apbChA = Channel A apbChB = Channel B

Description This command sets the Analog Input to Auto range or Fixed range. Care must be taken when using Fixed range that the input signal does not exceed the selected range.

See Also `ATS2.AnalogIn.Range`

ATS2.AnalogIn.SampleRate Property

Syntax **`ATS2.AnalogIn.SampleRate`**

Data Type Constant

apbAnalogInHIRES_65536
HiRes@65536

apbAnalogInHIRES_OSR
HiRes@OSR

apbAnalogInHIBW_131072
HiBW@131072

apbAnalogInHIBW_262144
HiBW@262144

apbAnalogInHIBW_2XOSR
HiBW@2xOSR

Description This command sets the Analog Input Converter Sample Rate.

ATS2.AnalogIn.Source Property

Syntax **`ATS2.AnalogIn.Source(`**`ByVal` *`Channel`* `As Constant, ByVal` *`Input`* `as Integer`**`)`**

Data Type Constant

apbAnalogInXLR_Bal
: XLR (Bal): Front panel XLR Analog Input connector, balanced

apbAnalogInBNC_Unbal
: BNC (unbal): Front panel BNC Analog Input connector, unbalanced

apbAnalogInGenMon
: GenMon: Internal connection from Analog Generator to Analog Input

Parameter

Name	Description
Channel	apbChA = Channel A apbChB = Channel B

Description This command selects the Analog Input connection for the specified channel.

Example See example for `ATS2.AnalogIn.DCCoupled`.

Chapter 20

Auxiliary Control Input and Output

ATS2.AuxControlIO.InputBitRdg — Property

Syntax **ATS2.AuxControlIO.InputBitRdg(**ByVal *Unit* As String**)**

Data Type Boolean

True	Bit state one.
False	Bit state zero.

Parameter

Name	Description
Bit	Bit value 0 - 7 allowed.

Description This command returns the state of a single bit of the Auxiliary Input.

See Also ATS2.AuxControlIO.Output

Example

```
Sub Main
   ATS.Application.PanelOpen(apbAuxDigIO)
   ATS2.AuxControlIO.Output("dec") = 85
   Wait .5
   For Bit = 0 To 7
      Debug.Print " & Bit & " set " & _
         CBool(ATS2.AuxControlIO.InputBitRdg(Bit))
   Next Bit
End Sub
```

Output

```
0 set True
1 set False
2 set True
3 set False
4 set True
5 set False
6 set True
7 set False
```

ATS2.AuxControlIO.InputRdg Property

Syntax `ATS2.AuxControlIO.InputRdg(ByVal Unit As String)`

Data Type Double

Parameter

Name	Description
Unit	The following units are available: dec, hex, and oct.

Description This command returns a reading for the Auxiliary Input.

See Also `ATS2.AuxControlIO.InputBitRdg`

Example

```
Sub Main
  ATS.Application.PanelOpen(apbAuxDigIO)
  ATS2.AuxControlIO.Output("dec") = 16
  Wait .5
  Debug.Print ATS2.AuxControlIO.InputRdg("dec")
End Sub
```

Output

```
16
```

ATS2.AuxControlIO.Output Property

Syntax `ATS2.AuxControlIO.Output(ByVal Units$ As String)`

Data Type Double

Parameter

Name	Description
Units$	The following units are available dec, hex, oct, h(x).

Description This command sets the value of the Auxiliary Output.

See Also `ATS2.AuxControlIO.OutputBit`

Example

```
Sub Main
  ATS.Application.PanelOpen(apbAuxDigIO)
  ATS2.AuxControlIO.Output("dec") = 16
  ATS2.AuxControlIO.Output("hex") = &h22
  ATS2.AuxControlIO.Output("oct") = &o104

  ATS2.AuxControlIO.Output("dec") = 0
  ATS2.AuxControlIO.OutputBit(0) = True
```

```
End Sub
```

ATS2.AuxControlIO.OutputBit Property

Syntax **ATS2.AuxControlIO.OutputBit(**ByVal *Bit* As Integer**)**

Data Type Boolean

True	Set bit state to one.
False	Set bit state to zero.

Parameter

Name	Description
Bit	Bit value 0 - 7 allowed.

Description This command sets the state of a single bit of the Auxiliary Output.

See Also ATS2.AuxControlIO.Output

Example See example for ATS2.AuxControlIO.Output.

Chapter 21

Status Bits

ATS2.Bits.AudioModeRdg — Property

Syntax

```
ATS2.Bits.AudioModeRdg(ByVal Channel As Constant, [Optional ByVal String As Variant])
```

Data Type Integer

Parameter

Name	Description
Channel	apbChA = Channel A apbChB = Channel B
String	Optional string containing status bit information.

Result

Constant	Description
apbBitsConAudio	Consumer Audio Mode
apbBitsConData	Consumer Data Mode
apbBitsProNonAudio	Professional Non Audio Mode
apbBitsProNormal	Professional Normal Mode

Description This command returns the Status Bits Audio Mode from an optional string or from the AES/EBU data stream. When the optional string parameter is included the command uses the designated string as the source for the reading. The string is obtained by using the `ATS2.Bits.StatusXferToString` command.

See Also `ATS2.Bits.StatusXferToString`

Example

```
Sub Main
  Debug.Print "Audio Mode = ";
  Select Case(ATS2.Bits.AudioModeRdg(apbChA))
     Case apbBitsConAudio
        Debug.Print "Consumer Audio Mode"
     Case apbBitsConData
        Debug.Print "Consumer Data Mode"
```

```
        Case apbBitsProNonAudio
           Debug.Print "Professional Non Audio Mode"
        Case apbBitsProNormal
           Debug.Print "Professional Normal Mode"
    End Select
End Sub
```

ATS2.Bits.AuxBitsRdg — Property

Syntax **ATS2.Bits.AuxBitsRdg(**ByVal *Channel* As Constant, [Optional ByVal *String* As Variant]**)**

Data Type Integer

Parameter

Name	Description
Channel	apbChA = Channel A apbChB = Channel B
String	Optional string containing status bit information.

Result

Constant	Description
apbBitsPro20BitNotDefined	20-bit not defined
apbBitsPro24BitMain	24-bit not defined
apbBitsPro20BitSingle	20-bit single
apbBitsProBitsReserved	Reserved

Description This command returns the Status Bits Auxiliary Bits from an optional string or from the AES/EBU data stream. When the optional string parameter is included the command uses the designated string as the source for the reading. The string is obtained by using the ATS2.Bits.StatusXferToString command.

See Also ATS2.Bits.StatusXferToString

Example

```
Sub Main
```

```
   If ATS2.Bits.ModeRdg(apbChA) = apbBitsModePro Then
      Debug.Print "Auxiliary Bits Reading = ";
      Select Case(ATS2.Bits.AuxBitsRdg(apbChA))
         Case apbBitsPro20BitNotDefined
            Debug.Print "20-bit not defined"
         Case apbBitsPro24BitMain
            Debug.Print "24-bit main audio"
         Case apbBitsPro20BitSingle
            Debug.Print "20-bit single"
         Case apbBitsProBitsReserved
            Debug.Print "Reserved"
      End Select
   End If
End Sub
```

ATS2.Bits.CategoryRdg — Property

Syntax

```
ATS2.Bits.CategoryRdg(ByVal Channel As Constant,
[Optional ByVal String As Variant])
```

Data Type Integer

Parameter

Name	Description
Channel	apbChA = Channel A apbChB = Channel B
String	Optional string containing status bit information.

Result

Constant	Description
apbBitsConGeneral	General
apbBitsConCD	CD Player
apbBitsConPCM	PCM Adaptor
apbBitsConDAT	DAT Recorder
apbBitsConDigBroadcast	Digital Broadcast
apbBitsConMusInst	Musical Instrument
apbBitsConDVD	DVD
apbBitsConPresAD	Present A/D Converter
apbBitsConFutureAD	Future A/D Converter
apbBitsConSolidState	Solid State Memory

apbBitsConExperimental	Experimental

Description This command returns the Status Bits Category code from an optional string or from the AES/EBU data stream. When the optional string parameter is included the command uses the designated string as the source for the reading. The string is obtained by using the `ATS2.Bits.StatusXferToString` command.

See Also `ATS2.Bits.StatusXferToString`

Example

```
Sub Main
  If ATS2.Bits.ModeRdg(apbChA) = apbBitsModeCons Then
     Debug.Print "Category Reading = ";
     Select Case(ATS2.Bits.CategoryRdg(apbChA))
        Case apbBitsConGeneral
           Debug.Print "General"
        Case apbBitsConCD
           Debug.Print "CD Player"
        Case apbBitsConPCM
           Debug.Print "PCM Adaptor"
        Case apbBitsConDAT
           Debug.Print "DAT Recorder"
        Case apbBitsConDigBroadcast
           Debug.Print "Digital Broadcast"
        Case apbBitsConMusInst
           Debug.Print "Musical Instrument"
     End Select
  End If
End Sub
```

ATS2.Bits.ChModeRdg — Property

Syntax `ATS2.Bits.ChModeRdg(ByVal Channel As Constant, [Optional ByVal String As Variant])`

Data Type Integer

Parameter

Name	Description
Channel	apbChA = Channel A apbChB = Channel B

String Optional string containing status bit information.

Result

Constant	Description
apbBitsProNotIndicated	Not Indicated
apbBitsProTwo	2-channel
apbBitsProSingle	Single-channal
apbBitsProPrimSec	Primary/Sec
apbBitsProStereo	Stereo
apbBitsProReserved1	Reserved-1
apbBitsProReserved2	Reserved-2
apbBitsProVector	Vector to byte 3
apbBitsProMonoDouble	Mono Double Rate
apbBitsProLeftDouble	Left Double Rate
apbBitsProRightDouble	Right Double Rate

Description

This command returns the Status Bits Channel Mode from an optional string or from the AES/EBU data stream. When the optional string parameter is included the command uses the designated string as the source for the reading. The string is obtained by using the `ATS2.Bits.StatusXferToString` command.

See Also

`ATS2.Bits.StatusXferToString`

Example

```
Sub Main
  If ATS2.Bits.ModeRdg(apbChA) = apbBitsModePro Then
     Debug.Print "Channel Mode Reading = ";
     Select Case(ATS2.Bits.ChModeRdg(apbChA))
        Case apbBitsProNotIndicated
           Debug.Print "Not Indicated"
        Case apbBitsProTwo
           Debug.Print "2-channel"
        Case apbBitsProSingle
           Debug.Print "Single-channel"
        Case apbBitsProPrimSec
           Debug.Print "Primary/Sec"
        Case apbBitsProStereo
           Debug.Print "Stereo"
        Case apbBitsProReserved1
           Debug.Print "Reserved-1"
        Case apbBitsProReserved2
```

```
            Debug.Print "Reserved-2"
         Case apbBitsProVector
            Debug.Print "Vector to byte 3"
         Case apbBitsProMonoDouble
            Debug.Print "Mono Double Rate"
         Case apbBitsProLeftDouble
            Debug.Print "Left Double Rate"
         Case apbBitsProRightDouble
            Debug.Print "Right Double Rate"
      End Select
   End If
End Sub
```

Output

```
Channel Mode Reading = Not Indicated
```

ATS2.Bits.ChNumRdg — Property

Syntax **ATS2.Bits.ChNumRdg(**ByVal *Channel* As Constant, [Optional ByVal *String* As Variant]**)**

Data Type Integer

Parameter

Name	Description
Channel	apbChA = Channel A apbChB = Channel B
String	Optional string containing status bit information.

Result

Constant	Description
apbBitsConCh_DontCare	Don't Care
apbBitsConCh_A	A (Left)
apbBitsConCh_B	B (Right)
apbBitsConCh_C	C
apbBitsConCh_D	D
apbBitsConCh_E	E
apbBitsConCh_F	F
apbBitsConCh_G	G
apbBitsConCh_H	H
apbBitsConCh_I	I
apbBitsConCh_J	J

apbBitsConCh_K	K
apbBitsConCh_L	L
apbBitsConCh_M	M
apbBitsConCh_N	N
apbBitsConCh_O	O

Description This command returns the Status Bits Channel Number from an optional string or from the AES/EBU data stream. When the optional string parameter is included the command uses the designated string as the source for the reading. The string is obtained by using the `ATS2.Bits.StatusXferToString` command.

See Also `ATS2.Bits.StatusXferToString`

Example

```
Sub Main
  If ATS2.Bits.ModeRdg(apbChA) = apbBitsModeCons Then
     Debug.Print "Channel Number Reading = ";
     Select Case(ATS2.Bits.ChNumRdg(apbChA))
        Case apbBitsConCh_DontCare
           Debug.Print "Don't Care"
        Case apbBitsConCh_A
           Debug.Print "A (Left)"
        Case apbBitsConCh_B
           Debug.Print "B (Right)"
        Case apbBitsConCh_C
           Debug.Print "C"
        Case apbBitsConCh_D
           Debug.Print "D"
        Case apbBitsConCh_E
           Debug.Print "E"
        Case apbBitsConCh_F
           Debug.Print "F"
        Case apbBitsConCh_G
           Debug.Print "G"
        Case apbBitsConCh_H
           Debug.Print "H"
        Case apbBitsConCh_I
           Debug.Print "I"
        Case apbBitsConCh_J
           Debug.Print "J"
        Case apbBitsConCh_K
```

```
            Debug.Print "K"
         Case apbBitsConCh_L
            Debug.Print "L"
         Case apbBitsConCh_M
            Debug.Print "M"
         Case apbBitsConCh_N
            Debug.Print "N"
         Case apbBitsConCh_O
            Debug.Print "O"
      End Select
   End If
End Sub
```

ATS2.Bits.ClockAccuracyRdg Property

Syntax **ATS2.Bits.ClockAccuracyRdg(**ByVal *Channel* As Constant, [Optional ByVal *String* As Variant]**)**

Data Type Integer

Parameter

Name	Description
Channel	apbChA = Channel A apbChB = Channel B
String	Optional string containing status bit information.

Result

Constant	Description
apbBitsConLevel1	Level 1
apbBitsConLevel2	Level 2
apbBitsConLevel3	Level 3
apbBitsConReserved	Reserved

Description This command returns the Status Bits Clock Accuracy from an optional string or from the AES/EBU data stream. When the optional string parameter is included the command uses the designated string as the source for the reading. The string is obtained by using the ATS2.Bits.StatusXferToString command.

See Also ATS2.Bits.StatusXferToString

Example

```
Sub Main
  If ATS2.Bits.ModeRdg(apbChA) = apbBitsModeCons Then
     Debug.Print "Clock Accuracy Reading = ";
     Select Case(ATS2.Bits.ClockAccuracyRdg(apbChA))
        Case apbBitsConLevel1
           Debug.Print "Level 1"
        Case apbBitsConLevel2
           Debug.Print "Level 2"
        Case apbBitsConLevel3
           Debug.Print "Level 3"
        Case apbBitsConReserved
           Debug.Print "Reserved"
     End Select
  End If
End Sub
```

ATS2.Bits.Cons.AudioMode

Property

Syntax `ATS2.Bits.Cons.AudioMode`

Data Type Constant

apbBitsConAudio	Audio Mode
apbBitsConData	Data Mode

Description This command sets the Mode parameter encoded in the Consumer Status Bits.

Example See example for `ATS2.Bits.Cons.Category`.

ATS2.Bits.Cons.Category

Property

Syntax `ATS2.Bits.Cons.Category`

Data Type Constant

apbBitsConGeneral	General
apbBitsConCD	CD Player
apbBitsConPCM	PCM Adaptor

apbBitsConDAT	DAT Recorder
apbBitsConDigBroadcast	Digital Broadcast
apbBitsConMusInst	Musical Instrument
apbBitsConDVD	DVD
apbBitsConPresAD	Present A/D Converter
apbBitsConFutureAD	Future A/D Converter
apbBitsConSolidState	Solid State Memory
apbBitsConExperimental	Experimental

Description This command sets the Catagory Code parameter (channel status bit C) encoded in the Consumer Status Bits.

System One digital I/O units always sends the same status bits on Channels A and B.

Example

```
Sub Main
  'other setup code ...
  ATS2.Bits.XmitChannel = apbBitsXmitChAB
  ATS2.Bits.Mode = apbBitsModeCons
  ATS2.Bits.Cons.AudioMode = apbBitsConData
  ATS2.Bits.Cons.CopyRight = apbBitsConNonCopyright
  ATS2.Bits.Cons.Emphasis = apbBitsConEmp50_15
  ATS2.Bits.Cons.Channels = apbBitsCon2Channel
  ATS2.Bits.Cons.Category = apbBitsConCD
  ATS2.Bits.Cons.SourceNum = apbBitsCon_1
  ATS2.Bits.Cons.ChNum = apbBitsConCh_A
  ATS2.Bits.Cons.SampleFreq = apbBitsCon_48k
  ATS2.Bits.Cons.ClockAccuracy = apbBitsConLevel1
  'rest of program ...
End Sub
```

ATS2.Bits.Cons.Channels — Property

Syntax **ATS2.Bits.Cons.Channels**

Data Type Constant

apbBitsCon2Channel	2 Channel
apbBitsCon4Channel	4 Channel

Description This command sets the Channel Mode parameter encoded in the Consumer Status Bits.

Example See example for `ATS2.Bits.Cons.Category`.

ATS2.Bits.Cons.ChNum Property

Syntax **`ATS2.Bits.Cons.ChNum`**

Data Type Constant

apbBitsConCh_DontCare	Don't Care
apbBitsConCh_A	A (Left)
apbBitsConCh_B	B (Right)
apbBitsConCh_C	C
apbBitsConCh_D	D
apbBitsConCh_E	E
apbBitsConCh_F	F
apbBitsConCh_G	G
apbBitsConCh_H	H
apbBitsConCh_I	I
apbBitsConCh_J	J
apbBitsConCh_K	K
apbBitsConCh_L	L
apbBitsConCh_M	M
apbBitsConCh_N	N
apbBitsConCh_O	O

Description This command sets the Source Number parameter encoded in the Consumer Status Bits.

See Also `ATS2.Bits.XmitChannel`

Example See example for `ATS2.Bits.Cons.Category`.

ATS2.Bits.Cons.ClockAccuracy Property

Syntax **`ATS2.Bits.Cons.ClockAccuracy`**

Data Type Constant

apbBitsConsLevel1	Level 1
apbBitsConsLevel2	Level 2
apbBitsConsLevel3	Level 3
apbBitsConReserved	Reserved

Description This command sets the Clock Accuracy parameter encoded in the Consumer Status Bits.

Example See example for `ATS2.Bits.Cons.Category`.

ATS2.Bits.Cons.Copyright — Property

Syntax **`ATS2.Bits.Cons.Copyright`**

Data Type Constant

apbBitsConCopyright	Copyright
apbBitsConNonCopyright	Non-Copyright

Description This command sets the Copyright parameter encoded in the Consumer Status Bits.

Example See example for `ATS2.Bits.Cons.Category`.

ATS2.Bits.Cons.Emphasis — Property

Syntax **`ATS2.Bits.Cons.Emphasis`**

Data Type Constant

apbBitsConEmphNo	No Pre-emph
apbBitsConEmph50_15	50/15S

Description This command sets the Emphasis parameter encoded in the Consumer Status Bits.

Example See example for `ATS2.Bits.Cons.Category`.

ATS2.Bits.Cons.SampleFreq Property

Syntax `ATS2.Bits.Cons.SampleFreq`

Data Type Constant

apbBitsCon_48k	48 kHz
apbBitsCon_41000	44.1 kHz
apbBitsCon_32k	32 kHz
apbBitsCon_24k	24 kHz
apbBitsCon_22k	22.05 kHz
apbBitsCon_192k	192 kHz
apbBitsCon_176k	176.4 kHz
apbBitsCon_96k	96 kHz
apbBitsCon_882k	88.2 kHz

Description This command sets the Frequency parameter encoded in the Consumer Status Bits.

Example See example for `ATS2.Bits.Cons.Category`.

ATS2.Bits.Cons.SourceNum Property

Syntax `ATS2.Bits.Cons.SourceNum`

Data Type Constant

apbBitsCon_DontCare	Don't Care
apbBitsCon_1	1
apbBitsCon_2	2
apbBitsCon_3	3
apbBitsCon_4	4
apbBitsCon_5	5
apbBitsCon_6	6
apbBitsCon_7	7
apbBitsCon_8	8
apbBitsCon_9	9
apbBitsCon_10	10
apbBitsCon_11	11
apbBitsCon_12	12

apbBitsCon_13	13
apbBitsCon_14	14
apbBitsCon_15	15

Description This command sets the Source Number parameter encoded in the Consumer Status Bits.

Example See example for `ATS2.Bits.Cons.Category`.

ATS2.Bits.CopyrightRdg — Property

Syntax

```
ATS2.Bits.CopyrightRdg(ByVal Channel As
Constant, [Optional ByVal String As Variant])
```

Data Type Integer

Parameter

Name	Description
Channel	apbChA = Channel A apbChB = Channel B
String	Optional string containing status bit information.

Result

Constant	Description
apbBitsConCopyright	Copyright
apbBitsConNonCopyright	Non-Copyright

Description This command returns the Status Bits Copyright status from an optional string or from the AES/EBU data stream. When the optional string parameter is included the command uses the designated string as the source for the reading. The string is obtained by using the `ATS2.Bits.StatusXferToString` command.

See Also `ATS2.Bits.StatusXferToString`

Example

```
Sub Main
  If ATS2.Bits.ModeRdg(apbChA) = apbBitsModeCons Then
     Debug.Print "Copyright Reading = ";
     Select Case(ATS2.Bits.CopyrightRdg(apbChA))
        Case apbBitsConCopyright
           Debug.Print "Copyright"
```

```
            Case apbBitsConNonCopyright
               Debug.Print "Non-Copyright"
         End Select
      End If
   End Sub
```

ATS2.Bits.CrcRdg Property

Syntax **ATS2.Bits.CrcRdg(**ByVal *Channel* As Constant, [Optional ByVal *String* As Variant]**)**

Data Type Integer

Parameter

Name	Description
Channel	apbChA = Channel A apbChB = Channel B
String	Optional string containing status bit information.

Result

Value	Description
True	Valid
False	Invalid

Description This command returns the Status Bits CRC state from an optional string or from the AES/EBU data stream. When the optional string parameter is included the command uses the designated string as the source for the reading. The string is obtained by using the ATS2.Bits.StatusXferToString command.

See Also ATS2.Bits.StatusXferToString

Example

```
Sub Main
   If ATS2.Bits.ModeRdg(apbChA) = apbBitsModePro Then
      Debug.Print "Crc Valid Reading = ";
      Select Case(ATS2.Bits.CrcRdg(apbChA))
         Case True
            Debug.Print "Valid"
         Case False
            Debug.Print "Invalid"
      End Select
   End If
```

```
End Sub
```

ATS2.Bits.DestinationRdg Property

Syntax **ATS2.Bits.DestinationRdg(**ByVal *Channel* As Constant, [Optional ByVal *String* As Variant]**)**

Data Type String

Parameter

Name	Description
Channel	apbChA = Channel A apbChB = Channel B
String	Optional string containing status bit information.

Description This command returns the Status Bits Destination Code from an optional string or from the AES/EBU data stream. When the optional string parameter is included the command uses the designated string as the source for the reading. The string is obtained by using the ATS2.Bits.StatusXferToString command.

See Also ATS2.Bits.StatusXferToString

Example

```
Sub Main
  If ATS2.Bits.ModeRdg(apbChA) = apbBitsModePro Then
     Debug.Print "Channel A Destination Reading = " _
        & ATS2.Bits.DestinationRdg(apbChA)
  End If
  If ATS2.Bits.ModeRdg(apbChB) = apbBitsModePro Then
     Debug.Print "Channel B Destination Reading = " _
        & ATS2.Bits.DestinationRdg(apbChB)
  End If
End Sub
```

ATS2.Bits.EmphRdg Property

Syntax **ATS2.Bits.EmphRdg(**ByVal *Channel* As Constant, [Optional ByVal *String* As Variant]**)**

Data Type Integer

Parameter

Name	Description
Channel	apbChA = Channel A apbChB = Channel B
String	Optional string containing status bit information.

Result

Constant	Description
The following list is for Consumer Mode.	
apbBitsConEmpNo	No Pre-emph
apbBitsConEmp50_15	50/15S
The following list is for Professional Mode.	
apbBitsProEmpNotIndicated	Not Indicated
apbBitsProEmpNone	None
apbBitsProEmp5015	50/15 uS
apbBitsProEmpJ17	CCITT J.17

Description This command returns the Status Bits Emphasis setting from an optional string or from the AES/EBU data stream. When the optional string parameter is included the command uses the designated string as the source for the reading. The string is obtained by using the `ATS2.Bits.StatusXferToString` command.

See Also `ATS2.Bits.StatusXferToString, ATS2.Bits.ModeRdg`

Example

```
Sub Main
   Debug.Print "Emphasis Reading = ";
   Select Case(ATS2.Bits.EmphRdg(apbChA))
      Case apbBitsConEmpNo
         Debug.Print "Consumer No Pre-emph"
      Case apbBitsConEmp50_15
         Debug.Print "Consumer 50/15S"
      Case apbBitsProEmpNotIndicated
         Debug.Print "Professional Not Indicated"
      Case apbBitsProEmpNone
         Debug.Print "Professional None"
      Case apbBitsProEmp5015
         Debug.Print "Professional 50/15S"
```

```
      Case apbBitsProEmpJ17
         Debug.Print "Professional CCITT J.17"
   End Select
End Sub
```

ATS2.Bits.FlagRdg — Property

Syntax **ATS2.Bits.FlagRdg(**ByVal *Channel* As Constant, ByVal FlagId As Constant, [Optional ByVal *String* As Variant]**)**

Data Type Boolean

Parameter

Name	Description
Channel	apbChA = Channel A apbChB = Channel B
FlagId	apbFlag0-5 = Select flag representing bits 0 - 5. apbFlag6-13 = Select flag representing bits 6 - 13. apbFlag14-17 = Select flag representing bits 14 - 17. apbFlag18-21 = Select flag representing bits 18 - 21.
String	Optional string containing status bit information.

Result

Value	Description
True	Set
False	Clear

Description This command returns the Status Bits Flag state from an optional string or from the AES/EBU data stream. When the optional string parameter is included the command uses the designated string as the source for the reading. The string is obtained by using the ATS2.Bits.StatusXferToString command.

See Also ATS2.Bits.StatusXferToString

Example

```
Sub Main
   Dim String_Array(1)
   String_Array(0) = "Cleared"
   String_Array(1) = "Set"
```

```
    ATS.Application.NewTest   'Reset panels
    ATS2.Bits.Mode = 1          'Professional Mode
    ATS2.Dio.InFormat = 3

    'Set flags 14-17
    ATS2.Bits.Pro.Flag(apbFlag14-17) = 1
    'Set Flags 18-21
    ATS2.Bits.Pro.Flag(apbFlag18-21) = 1

    Wait .5  'Wait for reading to update
    Debug.Print "Reliability Flags 0-5 Reading = " & _
       String_Array(ATS2.Bits.FlagRdg _
       (apbChA, apbFlag0-5))
    Debug.Print "Reliability Flags 6-13 Reading = " & _
       String_Array(ATS2.Bits.FlagRdg _
       (apbChA, apbFlag6-13))
    Debug.Print "Reliability Flags 14-17 Reading = " _
       & String_Array(ATS2.Bits.FlagRdg _
       (apbChA, apbFlag14-17))
    Debug.Print "Reliability Flags 18-21 Reading = " _
       & String_Array(ATS2.Bits.FlagRdg _
       (apbChA, apbFlag18-21))
End Sub
```

Output

```
Reliability Flags 0-5 Reading = Cleared
Reliability Flags 6-13 Reading = Cleared
Reliability Flags 14-17 Reading = Set
Reliability Flags 18-21 Reading = Set
```

ATS2.Bits.FreqModeRdg — Property

Syntax

ATS2.Bits.FreqModeRdg(ByVal *Channel* As Constant, [Optional ByVal *String* As Variant]**)**

Data Type Integer

Parameter

Name	Description
Channel	apbChA = Channel A apbChB = Channel B
String	Optional string containing status bit information.

Result

Constant	Description
apbBitsProFreqUnLock	Unlocked
apbBitsProFreqLock	Locked

Description This command returns the Status Bits Frequency Mode from an optional string or from the AES/EBU data stream. When the optional string parameter is included the command uses the designated string as the source for the reading. The string is obtained by using the `ATS2.Bits.StatusXferToString` command.

See Also `ATS2.Bits.StatusXferToString`

Example

```
Sub Main
  If ATS2.Bits.ModeRdg(apbChA) = apbBitsModePro Then
     Debug.Print "Frequency Mode Reading = ";
     Select Case(ATS2.Bits.FreqModeRdg(apbChA))
        Case apbBitsProFreqUnLock
           Debug.Print "Unlocked"
        Case apbBitsProFreqLock
           Debug.Print "Locked"
     End Select
  End If
End Sub
```

ATS2.Bits.LocalAddressRdg Property

Syntax **`ATS2.Bits.LocalAddressRdg(`**`ByVal` *`Channel`* `As Constant, [Optional ByVal` *`String`* `As Variant]`**`)`**

Data Type Long

Parameter

Name	Description
Channel	apbChA = Channel A apbChB = Channel B
String	Optional string containing status bit information.

Description This command returns the Status Bits Local Address code from an optional string or from the AES/EBU data stream. When the optional string parameter is included the command uses the designated string as the source for the reading. The string is obtained by using the `ATS2.Bits.StatusXferToString` command.

See Also `ATS2.Bits.StatusXferToString`

Example

```
Sub Main
   If ATS2.Bits.ModeRdg(apbChA) = apbBitsModePro Then
      Debug.Print "Ch A Local Address Reading = " _
         & ATS2.Bits.LocalAddressRdg(apbChA)
   End If
End Sub
```

ATS2.Bits.Mode — Property

Syntax **`ATS2.Bits.Mode`**

Data Type Constant

apbBitsModeCons	Consumer
apbBitsModePro	Professional

Description This command sets the Transmit Mode.

Example See example for `ATS2.Bits.Cons.Category`.

ATS2.Bits.ModeRdg — Property

Syntax **`ATS2.Bits.ModeRdg(`**`ByVal` *`Channel`* `As Constant, [Optional ByVal` *`String`* `As Variant]`**`)`**

Data Type Integer

Parameter

Name	Description
Channel	apbChA = Channel A apbChB = Channel B
String	Optional string containing status bit information.

Result

Constant	Description
apbBitsModeCons	Consumer
apbBitsModePro	Professional

Description This command returns the Status Bits Mode from an optional string or from the AES/EBU data stream. When the optional string parameter is included the command uses the designated string as the source for the reading. The string is obtained by using the `ATS2.Bits.StatusXferToString` command.

See Also `ATS2.Bits.StatusXferToString`

Example See example for `ATS2.Bits.LocalAddressRdg`.

ATS2.Bits.OriginRdg — Property

Syntax

```
ATS2.Bits.OriginRdg(ByVal Channel As Constant,
[Optional ByVal String As Variant])
```

Data Type String

Parameter

Name	Description
Channel	apbChA = Channel A apbChB = Channel B
String	Optional string containing status bit information.

Description This command returns the Status Bits Origin Code from an optional string or from the AES/EBU data stream. When the optional string parameter is included the command uses the designated string as the source for the reading. The string is obtained by using the `ATS2.Bits.StatusXferToString` command.

See Also `ATS2.Bits.StatusXferToString`

Example

```
Sub Main
  If ATS2.Bits.ModeRdg(apbChA) = apbBitsModePro Then
```

```
      Debug.Print "Channel A Origin Reading = " _
         & ATS2.Bits.OriginRdg(apbChA)
   End If
   If ATS2.Bits.ModeRdg(apbChB) = apbBitsModePro Then
      Debug.Print "Channel B Origin Reading = " _
         & ATS2.Bits.OriginRdg(apbChB)
   End If
End Sub
```

ATS2.Bits.Pro.AudioMode

Property

Syntax **ATS2.Bits.Pro.AudioMode**

Data Type Constant

apbBitsProNormal	Normal
apbBitsProNonAudio	Non Audio

Description This command sets the Audio Mode parameter encoded in the Professional Status Bits.

Example See example for `ATS2.Bits.Pro.LocalAddress`.

ATS2.Bits.Pro.AuxBits

Property

Syntax **ATS2.Bits.Pro.AuxBits**

Data Type Constant

apbBitsPro20BitNot	20-bit not defined
apbBitsPro24BitMain	24-bit main audio
apbBitsPro20BitSingle	20-bit single
apbBitsProBitsReserved	Reserved

Description This command sets the Aux Bits parameter encoded in the Professional Status Bits.

Example See example for `ATS2.Bits.Pro.LocalAddress`.

ATS2.Bits.Pro.ChMode

Property

Syntax `ATS2.Bits.Pro.ChMode`

Data Type Constant

apbBitsProNotIndicated	Not Indicated
apbBitsProTwo	2-channel
apbBitsProSingle	Single-channal
apbBitsProPrimSec	Primary/Sec
apbBitsProStereo	Stereo
apbBitsProReserved1	Reserved-1
apbBitsProReserved2	Reserved-2
apbBitsProVector	Vector to byte 3
apbBitsProMonoDouble	Mono Double Rate
apbBitsProLeftDouble	Left Double Rate
apbBitsProRightDouble	Right Double Rate

Description This command sets the Channel Mode parameter encoded in the Professional Status Bits.

Example See example for `ATS2.Bits.Pro.LocalAddress`.

ATS2.Bits.Pro.CrcEnable

Property

Syntax `ATS2.Bits.Pro.CrcEnable`

Result Boolean

True	Set
False	Clear

Description This command sets or clears the CRC parameter encoded in the Professional Status Bits.

The AES3 standard defines byte 23 as a CRC byte to assist the receiver in detecting errors in the preceding 23 bytes (0-22) of each channel status block.

Example See example for `ATS2.Bits.Pro.LocalAddress`.

ATS2.Bits.Pro.Destination Property

Syntax `ATS2.Bits.Pro.Destination`

Data Type String

Description This command sets a four-character alphanumeric (ASCII) code to be transmitted.

Example See example for `ATS2.Bits.Pro.LocalAddress`.

ATS2.Bits.Pro.Emphasis Property

Syntax `ATS2.Bits.Pro.Emphasis`

Result Constant

apbBitsProEmpNotIndicated	Not Indicated
apbBitsProEmpNone	None
apbBitsProEmp5015	50/15 uS
apbBitsProEmpJ17	CCITT J.17

Description This command sets the Emphasia parameter encoded in the Professional Status Bits.

Example See example for `ATS2.Bits.Pro.LocalAddress`.

ATS2.Bits.Pro.Flag Property

Syntax `ATS2.Bits.Pro.Flag(ByVal FlagId As Constant)`

Data Type Boolean

True	Set
False	Clear

Parameter	Name	Description
	FlagId	*apbFlag0-5* = Select flag representing bits 0 - 5. *apbFlag6-13* = Select flag representing bits 6 - 13. *apbFlag14-17* = Select flag representing bits 14 - 17. *apbFlag18-21* = Select flag representing bits 18 - 21.

Description This command sets or clears the Reliability Flag for the specified bytes.

This flag is to be set if useful information is not being transmitted in the corresponding status bytes.

Note that the Reliability Flags are not indications of the quality of the signal, but are simply a way for the transmitting device to tell the receiving device whether or not the information received in each group of six status bytes is valid.

Example See example for `ATS2.Bits.Pro.LocalAddress`.

ATS2.Bits.Pro.FreqMode — Property

Syntax **`ATS2.Bits.Pro.FreqMode`**

Data Type Constant

apbBitsProFreqUnLock	Unlocked
apbBitsProFreqLock	Locked

Description This command sets the Frequency Mode parameter encoded in the Professional Status Bits.

Example See example for `ATS2.Bits.Pro.LocalAddress`.

ATS2.Bits.Pro.LocalAddress — Property

Syntax **`ATS2.Bits.Pro.LocalAddress`**

Data Type Long

Description This command sets the Local Address parameter encoded in the Professional Status Bits bytes 14-17.

The Local Address is a timer function defined in the Professional standard only.

See Also `ATS2.Bits.Pro.AddressAuto`

Example

```
Sub Main
```

```
  'other setup code ...
  ATS2.Bits.XmitChannel = apbBitsXmitChB
  ATS2.Bits.Mode = apbBitsModePro
  ATS2.Bits.Pro.AudioMode = apbBitsProNonAudio
  ATS2.Bits.Pro.Emphasis = apbBitsProEmp5015
  ATS2.Bits.Pro.FreqMode = apbBitsProFreqUnLock
  ATS2.Bits.Pro.SampleFreq = apbBitsPro_48k
  ATS2.Bits.Pro.ChMode = apbBitsProStereo
  ATS2.Bits.Pro.UserBits = apbBitsProUBitsUser
  ATS2.Bits.Pro.AuxBits = apbBitsPro24BitMain
  ATS2.Bits.Pro.WordLength = apbBitsProLen24
  ATS2.Bits.Pro.RefSignal = apbBitsProGrade2
  ATS2.Bits.Pro.Origin = "ATS2"
  ATS2.Bits.Pro.Destination = "TEST"
  ATS2.Bits.Pro.LocalAddressAuto = False
  ATS2.Bits.Pro.LocalAddress = 123456
  ATS2.Bits.Pro.TimeOfDay = 1234
  ATS2.Bits.Pro.Flag(apbFlag0_5) = True
  ATS2.Bits.Pro.Flag(apbFlag6_13) = True
  ATS2.Bits.Pro.Flag(apbFlag14_17) = False
  ATS2.Bits.Pro.Flag(apbFlag18_21) = True
  ATS2.Bits.Pro.CrcEnable = True
  'Rest of program
End Sub
```

ATS2.Bits.Pro.LocalAddressAuto — Property

Syntax `ATS2.Bits.Pro.LocalAddressAuto`

Data Type Boolean

True	Enabled
False	Disabled

Description This command enables or disables automatic selection of the Local Address and Time Of Day values.

If the Local Address Auto box via this command is enabled, both the Local Address value transmitted (bytes 14-17) and the Time of Day value (bytes 18-21) are the count, in samples, of the elapsed time since the Professional format of status bytes was selected or the Auto

box was checked (whichever was later). If the Auto box is not checked, an entry field is displayed to the right of the Auto box. A number may be enered into this field via the `ATS2.Bits.Pro.LocalAddress` command and the number will be continuously transmitted as the Local Address code in the status bytes.

See Also `ATS2.Bits.Pro.LocalAddress`, `ATS2.Bits.Pro.TimeOfDay`

Example See example for `ATS2.Bits.Pro.LocalAddress`.

ATS2.Bits.Pro.Origin — Property

Syntax **`ATS2.Bits.Pro.Origin`**

Data Type String

Description This command sets a four-character alphanumeric (ASCII) code to be transmitted.

Example See example for `ATS2.Bits.Pro.LocalAddress`.

ATS2.Bits.Pro.RefSignal — Property

Syntax **`ATS2.Bits.Pro.RefSignal`**

Data Type Constant

apbBitsProNotSignal	Not a ref. Signal
apbBitsProGrade1	Grade 1
apbBitsProGrade2	Grade 2
apbBitsProReserved	Reserved

Description This command sets the ReferenceSignal parameter encoded in the Professional Status Bits.

Example See example for `ATS2.Bits.Pro.LocalAddress`.

ATS2.Bits.Pro.SampleFreq Property

Syntax `ATS2.Bits.Pro.SampleFreq`

Data Type Constant

apbBitsPro_NotIndicated	Not Indicated
apbBitsPro_48k	48 kHz
apbBitsPro_44k	44.1 kHz
apbBitsPro_32k	32 kHz
apbBitsPro_192k	192 kHz
apbBitsPro_192k1001	192/1.001 kHz
apbBitsPro_176k	176.4 kHz
apbBitsPro_176k1001	176.4/1.001 kHz
apbBitsPro_96k	96 kHz
apbBitsPro_96k1001	96/1.001 kHz
apbBitsPro_88k	88.2 kHz
apbBitsPro_88k1001	88.2/1.001 kHz
apbBitsPro_48k1001	48/1.001 kHz
apbBitsPro_44k1001	44.1/1.001 kHz
apbBitsPro_32k1001	32/1.001 kHz
apbBitsPro_24k	24 kHz
apbBitsPro_24k1001	24/1.001 kHz
apbBitsPro_22k	22.05 kHz
apbBitsPro_22k1001	22.05/1.001 kHz

Description This command sets the Frequency parameter encoded in the Professional Status Bits.

Example See example for `ATS2.Bits.Pro.LocalAddress`.

ATS2.Bits.Pro.TimeOfDay Property

Syntax `ATS2.Bits.Pro.TimeOfDay`

Data Type Long

Description This command sets the Time Of Day parameter encoded in the Professional Status Bits bytes 18-21.

See Also `ATS2.Bits.Pro.AddressAuto`

Example See example for `ATS2.Bits.Pro.LocalAddress`.

ATS2.Bits.Pro.UserBits

Property

Syntax **`ATS2.Bits.Pro.UserBits`**

Data Type Constant

apbBitsProUBitsNone	None
apbBitsProUBits192	192-bit block
apbBitsProUBitsReserved	Reserved
apbBitsProUBitsUser	User defined

Description This command sets the User Bits parameter encoded in the Professional Status Bits.

Example See example for `ATS2.Bits.Pro.LocalAddress`.

ATS2.Bits.Pro.WordLength

Property

Syntax **`ATS2.Bits.Pro.WordLength`**

Data Type Constant

The following list contains the selections relevant to the `ATS2.Bits.Pro.AuxBits` command "20-bit not defined" selection.

apbBitsProLenNotIndicated	Not Indicated
apbBitsProLen20	20 bits
apbBitsProLen19	19 bits
apbBitsProLen18	18 bits
apbBitsProLen17	17 bits
apbBitsProLen16	16 bits

The following list contains the selections relevant to the `ATS2.Bits.Pro.AuxBits` command "24-bit main audio" selection.

apbBitsProLenNotIndicated	Not Indicated
apbBitsProLen24	24 bits

apbBitsProLen23	23 bits
apbBitsProLen22	22 bits
apbBitsProLen21	21 bits
apbBitsProLen20	20 bits

Description This command sets the Audio Word Length parameter encoded in the Professional Status Bits.

Example See example for `ATS2.Bits.Pro.LocalAddress`.

ATS2.Bits.RefSignalRdg — Property

Syntax **`ATS2.Bits.RefSignalRdg(`**`ByVal` *`Channel`* `As Constant, [Optional ByVal` *`String`* `As Variant]`**`)`**

Data Type Integer

Parameter

Name	Description
Channel	apbChA = Channel A apbChB = Channel B
String	Optional string containing status bit information.

Result

Constant	Description
0	Not a ref. Signal
1	Grade 1
2	Grade 2
3	Reserved

Description This command returns the Status Bits Reference Signal setting from an optional string or from the AES/EBU data stream. When the optional string parameter is included the command uses the designated string as the source for the reading. The string is obtained by using the `ATS2.Bits.StatusXferToString` command.

See Also `ATS2.Bits.StatusXferToString`

Example

```
Sub Main
  If ATS2.Bits.ModeRdg(apbChA) = apbBitsModePro Then
     Debug.Print "Reference Signal Reading = ";
     Select Case(ATS2.Bits.RefSignalRdg(apbChA))
```

```
            Case apbBitsProNotSignal
               Debug.Print "Not a ref. Signal"
            Case apbBitsProGrade1
               Debug.Print "Grade 1"
            Case apbBitsProGrade2
               Debug.Print "Grade 2"
            Case apbBitsProReserved
               Debug.Print "Reserved"
         End Select
      End If
   End Sub
```

Output

```
Reference Signal Reading = Not a ref. Signal
```

ATS2.Bits.SampleFreqRdg — Property

Syntax

ATS2.Bits.SampleFreqRdg(ByVal *Channel* As Constant, [Optional ByVal *String* As Variant]**)**

Data Type

Integer

Parameter

Name	Description
Channel	apbChA = Channel A apbChB = Channel B
String	Optional string containing status bit information.

Result

Constant	Description
The following list is for Consumer Mode:	
apbBitsCon_48k	48 kHz
apbBitsCon_41000	44.1 kHz
apbBitsCon_32k	32 kHz
apbBitsCon_24k	24 kHz
apbBitsCon_22k	22.05 kHz
apbBitsCon_192k	192 kHz
apbBitsCon_176k	176.4 kHz
apbBitsCon_96k	96 kHz
apbBitsCon_882k	88.2 kHz

The following list is for Professional Mode:

apbBitsPro_NotIndicated	Professional Not Indicated
apbBitsPro_48k	48 kHz
apbBitsPro_44k	44.1 kHz
apbBitsPro_32k	32 kHz
apbBitsPro_192k	192 kHz
apbBitsPro_192k1001	192/1.001 kHz
apbBitsPro_176K	176.4 kHz
apbBitsPro_176k1001	176.4/1.001 kHz
apbBitsPro_96k	96 kHz
apbBitsPro_96k1001	96/1.001 kHz
apbBitsPro_88k	88.2 kHz
apbBitsPro_88k1001	88.2/1.001 kHz
apbBitsPro_48k1001	48/1.001 kHz
apbBitsPro_44k1001	44.1/1.001 kHz
apbBitsPro_32k1001	32/1.001 kHz
apbBitsPro_24k	24 kHz
apbBitsPro_24k1001	24/1.001 kHz
apbBitsPro_22k	22.05 kHz
apbBitsPro_22k1001	22.05/1.001 kHz

Description This command returns the Status Bits Sample Frequency from an optional string or from the AES/EBU data stream. When the optional string parameter is included the command uses the designated string as the source for the reading. The string is obtained by using the `ATS2.Bits.StatusXferToString` command.

See Also `ATS2.Bits.StatusXferToString`

Example

```
Sub Main
   Debug.Print "Sample Freq Reading = ";
   Select Case(ATS2.Bits.SampleFreqRdg(apbChA))
      Case apbBitsCon_48k
         Debug.Print "Consumer 48 kHz"
      Case apbBitsCon_44100
         Debug.Print "Consumer 44.1 kHz"
      Case apbBitsCon_32k
         Debug.Print "Consumer 32 kHz"
      Case apbBitsPro_NotIndicated
         Debug.Print "Professional Not Indicated"
```

```
        Case apbBitsPro_96k1001
           Debug.Print "Professional 96/1.001 kHz"
        Case apbBitsPro_96k
           Debug.Print "Professional 96 kHz"
        Case apbBitsPro_88k1001
           Debug.Print "Professional 88.2/1.001 kHz"
        Case apbBitsPro_88k
           Debug.Print "Professional 88.2 kHz"
        Case apbBitsPro_48k1001
           Debug.Print "Professional 48/1.001 kHz"
        Case apbBitsPro_48k
           Debug.Print "Professional 48 kHz"
        Case apbBitsPro_44k1001
           Debug.Print "Professional 44.1/1.001 kHz"
        Case apbBitsPro_44k
           Debug.Print "Professional 44.1 kHz"
        Case apbBitsPro_32k1001
           Debug.Print "Professional 32/1.001 kHz"
        Case apbBitsPro_32k
           Debug.Print "Professional 32 kHz"
        Case apbBitsPro_24k1001
           Debug.Print "Professional 24/1.001 kHz"
        Case apbBitsPro_24k
           Debug.Print "Professional 24 kHz"
        Case apbBitsPro_22k1001
           Debug.Print "Professional 22.05/1.001 kHz"
        Case apbBitsPro_22k
           Debug.Print "Professional 22.05 kHz"
        Case apbBitsPro_192k1001
           Debug.Print "Professional 192/1.001 kHz"
        Case apbBitsPro_192k
           Debug.Print "Professional 192 kHz"
        Case apbBitsPro_176k1001
           Debug.Print "Professional 176.4/1.001 kHz"
        Case apbBitsPro_176k
           Debug.Print "Professional 176.4 kHz"
     End Select
End Sub
```

ATS2.Bits.SourceNumRdg

Property

Syntax

```
ATS2.Bits.SourceNumRdg(ByVal Channel As
Constant, [Optional ByVal String As Variant])
```

Data Type Integer

Parameter

Name	Description
Channel	apbChA = Channel A apbChB = Channel B
String	Optional string containing status bit information.

Result

Constant	Description
apbBitsCon_DontCare	Don't Care
apbBitsCon_1	Source number 1
apbBitsCon_2	Source number 2
apbBitsCon_3	Source number 3
apbBitsCon_4	Source number 4
apbBitsCon_5	Source number 5
apbBitsCon_6	Source number 6
apbBitsCon_7	Source number 7
apbBitsCon_8	Source number 8
apbBitsCon_9	Source number 9
apbBitsCon_10	Source number 10
apbBitsCon_11	Source number 11
apbBitsCon_12	Source number 12
apbBitsCon_13	Source number 13
apbBitsCon_14	Source number 14
apbBitsCon_15	Source number 15

Description This command returns the Status Bits Source Number from an optional string or from the AES/EBU data stream. When the optional string parameter is included the command uses the designated string as the source for the reading. The string is obtained by using the `ATS2.Bits.StatusXferToString` command.

See Also `ATS2.Bits.StatusXferToString`

Example

```
Sub Main
   If ATS2.Bits.ModeRdg(apbChA) = apbBitsModeCons Then
```

```
        Debug.Print "Source Number Reading = ";
        Select Case(ATS2.Bits.SourceNumRdg(apbChA))
           Case apbBitsCon_DontCare
              Debug.Print "Don't care"
           Case apbBitsCon_1
              Debug.Print "1"
           Case apbBitsCon_2
              Debug.Print "2"
           Case apbBitsCon_3
              Debug.Print "3"
           Case apbBitsCon_4
              Debug.Print "4"
           Case apbBitsCon_5
              Debug.Print "5"
           Case apbBitsCon_6
              Debug.Print "6"
           Case apbBitsCon_7
              Debug.Print "7"
           Case apbBitsCon_8
              Debug.Print "8"
           Case apbBitsCon_9
              Debug.Print "9"
           Case apbBitsCon_10
              Debug.Print "10"
           Case apbBitsCon_11
              Debug.Print "11"
           Case apbBitsCon_12
              Debug.Print "12"
           Case apbBitsCon_13
              Debug.Print "13"
           Case apbBitsCon_14
              Debug.Print "14"
           Case apbBitsCon_15
              Debug.Print "15"
        End Select
     End If
  End Sub
```

ATS2.Bits.StatusXferToString Method

Syntax **ATS2.Bits.StatusXferToString(**ByVal *Channel* As Constant)

Parameter

Name	Description
Channel	apbChA = Channel A apbChB = Channel B
String	Optional string containing status bit information.

Result String

Description This command transfers the contents of the Status Bits into an string. This enable the programmer to extract all of the status information from an single measurement.

See Also ATS2.Bits.XmitData

Example

```
'#uses"ConstantStrings.atsb"
Sub Main
  With ATS2.Bits
     Channel_A_Status = .StatusXferToString(apbChA)
     Mode = .ModeRdg(apbChA, Channel_A_Status)
     If Mode = apbBitsModeCons  Then
     Debug.Print "Mode = Consumer"
        Debug.Print "Audio Mode = " & _
           (.AudioModeRdg(apbChA, Channel_A_Status))
        Debug.Print "Copyright = " & _
           (.CopyrightRdg(apbChA, Channel_A_Status))
        Debug.Print "Emphasis = " & _
           (.EmphRdg(apbChA, Channel_A_Status))
        Debug.Print "Channel Mode = " & _
           (.ChModeRdg(apbChA, Channel_A_Status))
        Debug.Print "Category Code = " & _
           (.CategoryRdg(apbChA, Channel_A_Status))
        Debug.Print "Source Number = " & _
           (.SourceNumRdg(apbChA, Channel_A_Status))
        Debug.Print "Channel Number = " & _
           (.ChNumRdg(apbChA, Channel_A_Status))
        Debug.Print "Sample Frequency = " & _
           (.SampleFreqRdg(apbChA, Channel_A_Status))
```

```
            Debug.Print "Clock Accuracy = " & _
               (.ClockAccuracyRdg(apbChA,
Channel_A_Status))

         ElseIf Mode = apbBitsModePro then
         Debug.Print "Mode = Professional"
            Debug.Print "Audio Mode = " & TextStr _
               (.AudioModeRdg(apbChA, Channel_A_Status))
            Debug.Print "Emphasis = " & _
               (.EmphRdg(apbChA, Channel_A_Status))
            Debug.Print "Frequency Mode = " & _
               (.FreqModeRdg(apbChA, Channel_A_Status))
            Debug.Print "Sample Frequency = " & _
               (.SampleFreqRdg(apbChA, Channel_A_Status))
            Debug.Print "Channel Mode = " & _
               (.ChModeRdg(apbChA, Channel_A_Status))
            Debug.Print "User Bits = " & _
               (.UserBitsRdg(apbChA, Channel_A_Status))
            Debug.Print "Aux Bits = " & _
               (.AuxBitsRdg(apbChA, Channel_A_Status))
            Debug.Print "Word Length = " & _
               (.WordLengthRdg(apbChA, Channel_A_Status))
            Debug.Print "Ref Signal = " & _
               (.RefSignalRdg(apbChA, Channel_A_Status))
            Debug.Print "Origin Code = " & _
               .OriginRdg(apbChA, Channel_A_Status)
            Debug.Print "Destination Code = " & _
               .DestinationRdg(apbChA, Channel_A_Status)
            Debug.Print "Local Address = " & _
               .LocalAddressRdg(apbChA, Channel_A_Status)
            Debug.Print "Time Of Day = " & _
               .TimeOfDayRdg(apbChA, Channel_A_Status)
            Debug.Print "Flag 0-5 = " & _
               .FlagRdg(apbChA, apbFlag0_5, _
               Channel_A_Status)
            Debug.Print "Flag 6-13 = " & _
               .FlagRdg(apbChA, apbFlag6_13, _
               Channel_A_Status)
            Debug.Print "Flag 14-17 = " & _
               .FlagRdg(apbChA, apbFlag14_17, _
               Channel_A_Status)
```

```
            Debug.Print "Flag 18-21 = " & _
               .FlagRdg(apbChA, apbFlag18_21, _
               Channel_A_Status)
            Debug.Print "Crc Valid = " & _
               .CrcRdg(apbChA, Channel_A_Status)
         End If
      End With
   End Sub
```

ATS2.Bits.TimeOfDayRdg — Property

Syntax **ATS2.Bits.TimeOfDayRdg(**ByVal *Channel* As Constant, [Optional ByVal *String* As Variant]**)**

Data Type Long

Parameter

Name	Description
Channel	apbChA = Channel A apbChB = Channel B
String	Optional string containing status bit information.

Description This command returns the Status Bits Time Of Day code from an optional string or from the AES/EBU data stream. When the optional string parameter is included the command uses the designated string as the source for the reading. The string is obtained by using the ATS2.Bits.StatusXferToString command.

See Also ATS2.Bits.StatusXferToString

Example

```
Sub Main
   ATS.Application.NewTest
   ATS2.Bits.Mode = apbBitsModePro
   ATS2.Bits.Pro.LocalAddressAuto = False
   ATS2.Bits.Pro.TimeOfDay = 123456789
   ATS.S2Dio.InFormat = apbDioInGenMon
   Wait .5
   Debug.Print "Ch A Time Of Day Reading = " & _
      ATS2.Bits.TimeOfDayRdg(apbChA)
   Debug.Print "Ch B Time Of Day Reading = " & _
```

```
        ATS2.Bits.TimeOfDayRdg(apbChB)
End Sub
```

Output

```
Ch A Time Of Day Reading = 123456789
Ch B Time Of Day Reading = 123456789
```

ATS2.Bits.UserBitsRdg — Property

Syntax `ATS2.Bits.UserBitsRdg(ByVal Channel As Constant, [Optional ByVal String As Variant])`

Data Type Integer

Parameter

Name	Description
Channel	apbChA = Channel A apbChB = Channel B
String	Optional string containing status bit information.

Result

Constant	Description
apbBitsProUBitsNone	None
apbBitsProUBits192	192-bit block
apbBitsProUBitsReserved	Reserved
apbBitsProUBitsUser	User defined

Description This command returns the Status Bits User Bits from an optional string or from the AES/EBU data stream. When the optional string parameter is included the command uses the designated string as the source for the reading. The string is obtained by using the `ATS2.Bits.StatusXferToString` command.

See Also `ATS2.Bits.StatusXferToString`

Example

```
Sub Main
  If ATS2.Bits.ModeRdg(apbChA) = apbBitsModePro Then
     Debug.Print "User Bits Reading = ";
     Select Case(ATS2.Bits.UserBitsRdg(apbChA))
        Case apbBitsProUBitsNone
           Debug.Print "None"
        Case apbBitsProUBits192
           Debug.Print "192-bit block"
```

```
            Case apbBitsProUBitsReserved
               Debug.Print "Reserved"
            Case apbBitsProUBitsUser
               Debug.Print "User defined"
         End Select
      End If
   End Sub
```

ATS2.Bits.WordLengthRdg Property

Syntax **ATS2.Bits.WordLengthRdg(**ByVal *Channel* As Constant, [Optional ByVal *String* As Variant]**)**

Data Type Integer

Parameter

Name	Description
Channel	apbChA = Channel A apbChB = Channel B
String	Optional string containing status bit information.

Result

Constant	Description
apbBitsProLenNotIndicated	Not Indicated
apbBitsProLen24	24 bits
apbBitsProLen23	23 bits
apbBitsProLen22	22 bits
apbBitsProLen20	20 bits
apbBitsProLen19	19 bits
apbBitsProLen18	18 bits
apbBitsProLen17	17 bits
apbBitsProLen16	16 bits

Description This command returns the Status Bits Word Length from an optional string or from the AES/EBU data stream. When the optional string parameter is included the command uses the designated string as the source for the reading. The string is obtained by using the ATS2.Bits.StatusXferToString command.

See Also ATS2.Bits.StatusXferToString

Example

```
Sub Main
   If ATS2.Bits.ModeRdg(apbChA) = apbBitsModePro Then
      Debug.Print "Word Length Reading = ";
      Select Case(ATS2.Bits.WordLengthRdg(apbChA))
         Case apbBitsProLenNotIndicated
            Debug.Print "Not Indicated"
         Case apbBitsProLen24
            Debug.Print "24 bits"
         Case apbBitsProLen23
            Debug.Print "23 bits"
         Case apbBitsProLen22
            Debug.Print "22 bits"
         Case apbBitsProLen21
            Debug.Print "21 bits"
         Case apbBitsProLen20
            Debug.Print "20 bits"
         Case apbBitsProLen19
            Debug.Print "19 bits"
         Case apbBitsProLen18
            Debug.Print "18 bits"
         Case apbBitsProLen17
            Debug.Print "17 bits"
         Case apbBitsProLen16
            Debug.Print "16 bits"
      End Select
   End If
End Sub
```

ATS2.Bits.XmitChannel — Property

Syntax `ATS2.Bits.XmitChannel`

Data Type Constant

apbBitsXmitChA	A
apbBitsXmitChB	B
apbBitsXmitChAB	A & B

Description This command sets the Transmit Channel.

Example See example for `ATS2.Bits.Pro.LocalAddress`.

ATS2.Bits.XmitStatus Property

Syntax **`ATS2.Bits.XmitStatus(`**`ByVal` *`Channel`* `As Constant`**`)`**

Data Type String — String containing status bit information.

Parameter

Name	Description
`Channel`	apbChA = Channel A apbChB = Channel B

Description This command transmits the status bits data contained in the string for the specified channel.

See Also `ATS2.Bits.StatusXferToString`

Example

```
Sub Main
  With ATS2.Bits
     Channel_A_Status = .StatusXferToString(apbChA)
     Channel_B_Status = .StatusXferToString(apbChA)

     'Your code goes here

     .XmitStatus(apbChA) = Channel_A_Status
     .XmitStatus(apbChB) = Channel_B_Status
  End With
End Sub
```

User Notes

Chapter 22

DCX-127

ATS2.DCX.DcLevel — Property

Syntax `ATS2.DCX.DcLevel(ByVal Output As Constant, ByVal Unit As String)`

Data Type Double — -10.5 to 10.5 Volts

Parameter

Name	Description
Output	apbOutput1 = Select output 1 apbOutput2 = Select output 2
Unit	The following units are available Vdc.

Description This command sets the voltage at the DCX's selected DC output.

Example

```
Sub Main
  ATS.Application.PanelOpen(apbDCX, apbLarge)
  ATS2.DCX.DcOutput(apbOutput1) = True
  ATS2.DCX.DcLevel(apbOutput1, "Vdc") = 1.5
End Sub
```

Comment This macro turns on the DCX's DC output number 1 and sets the level to 1.5 volts.

ATS2.DCX.DcOutput — Property

Syntax `ATS2.DCX.DcOutput(ByVal Output As Constant)`

Data Type Boolean

True	Connects the output to the front panel.
False	Disconnects the output from the front panel.

Parameter	Name	Description
	Output	apbOutput1 = Output 1 apbOutput2 = Output 2

Description This command sets DC Volts output to On or Off.

Example See example for `ATS2.DCX.DcLevel`.

ATS2.DCX.DigInFormat Property

Syntax **`ATS2.DCX.DigInFormat`**

Data Type Constant

apbDcx2sComp
: 2's Complement

apbDcxBCD
: BCD

Description This command sets the format of the digital input.

The digital ports are 21 bits plus a sign bit.

The normal format is two's complement. This format combines the bits into a 22 bit word that follows normal two's complement conventions (-1 is represented as 3FFFFF hex).

The BCD (Binary coded decimal) format is a signed magnitude representation (-1 is represented as 200001 hex, -10 is 200010 hex, etc.). As is normal in the BCD format, each decimal digit is represented by 4 bits.

Example

```
Sub Main
  ATS.Application.PanelOpen(apbDCX, apbLarge)
  ATS2.DCX.DigOutFormat = apbDcxBCD
  ATS2.DCX.DigInRdgRate = apbDcx_4
  ATS2.DCX.DigOut("dec") = 100
  ATS2.DCX.DigInFormat = apbDcxBCD
  Reading1 = ATS2.DCX.DigInRdg("dec")
  ATS2.DCX.DigOut("h(x)") = 100
  ATS2.DCX.DigOutScale = 2
```

```
  ATS2.DCX.DigInSettling(.20, .1, "Dec", 4, .05,
apbNone)
  ATS2.DCX.DigInTrig
  Do
  Loop Until ATS2.DCX.DigInReady
  Reading2 = ATS2.DCX.DigInRdg("dec")
  ATS2.DCX.DigInScale = .5
  Reading3 = ATS2.DCX.DigInRdg("g(x)")
  NewLine$ = Chr(13)
  a$= "Reading1 "+Left(Str$(Reading1),6)+"dec"
  b$= "Reading2 "+Left(Str$(Reading2),6)+"dec"
  c$= "Reading3 "+Left(Str$(Reading3),6)+"dec"
  ATS.Prompt.Text = a$ & vbCR & b$ & vbCR $ & c$
  ATS.Prompt.ShowWithContinue
  Beep
  Stop
End Sub
```

ATS2.DCX.DigInRdg — Property

Syntax **ATS2.DCX.DigInRdg(**ByVal *Unit* As String**)**

Data Type Double

Parameter

Name	Description
Unit	The following units are available: dec, hex,oct, and g(x).

Description This command returns a settled reading for the DCX-127 Digital In meter and zeros the ready count.

See Also ATS2.DCX.DigInReady, ATS2.DCX.DigInSettling, ATS2.DCX.DigInTrig

Example See example for ATS2.DCX.DigInFormat.

ATS2.DCX.DigInRdgRate — Property

Syntax **ATS2.DCX.DigInRdgRate**

Data Type Constant

apbDcx_External
External Strobe (Default).

apbDcx_4
4 readings per second.

apbDcx_8
8 readings per second.

apbDcx_16
16 readings per second.

apbDcx_32
32 readings per second.

Description This command selects an internal or external strobe for the digital input.

If 0 is selected, the External Strobe available on pin (25) of the digital input connector is used to trigger each new reading. If 1-4 is selected, an internal strobe is used at the specified rate.

Example See example for `ATS2.DCX.DigInFormat`.

ATS2.DCX.DigInReady — Property

Syntax **`ATS2.DCX.DigInReady`**

Data Type Integer

0	Reading not ready.
>0	Reading ready.

Description This command returns the DCX-127 Digital In settled reading ready count.

Because readings do not return until a reading is ready, this command may be used to avoid waiting for a reading. This command does NOT zero the ready count and so may be called any number of times. Only a call to the `ATS2.DCX.DigInRdg` or `ATS2.DCX.DigInTrig` commands will zero the ready count.

If the reading is found to be ready, a call to the `ATS2.DCX.DigInRdg` command will be guaranteed to return quickly.

See Also `ATS2.DCX.DigInRdg, ATS2.DCX.DigInSettling, ATS2.DCX.DigInTrig`

Example See example for `ATS2.DCX.DigInFormat`.

ATS2.DCX.DigInScale — Property

Syntax **`ATS2.DCX.DigInScale`**

Data Type Double

Description This command sets the DCX-127 Digital Input Scale factor.

When g(x) units are selected at the Digital In display, ATS software computes the displayed value from the relationship

display = measurement * Scale (g)

where measurement is the decimal value of the binary data in the selected format and Scale (g) is the value entered in the Scale (g) field just below the Digital In display.

Example See example for `ATS2.DCX.DigInFormat`.

ATS2.DCX.DigInSettling — Method

Syntax **`ATS2.Inst.Analyzer.DigInSettling(`**`ByVal` *`Tolerance`* `As Double, ByVal` *`Floor`* `As Double, ByVal` *`FloorUnit`* `As String, ByVal` *`Points`* `As Integer, ByVal` *`Delay`* `As Double, ByVal` *`Algorithm As Constant`*`)`

Parameter See Appendix A for Settling Algorithm and parameter name descriptions.

Description This command sets the settling parameters for the `ATS2.DCX.DigInRdg` command.

See Also `ATS2.DCX.DigInFormat, ATS2.DCX.DigInRdg, ATS2.DCX.DigInReady, ATS2.DCX.DigInTrig`

Example See example for `ATS2.DCX.DigInFormat`.

ATS2.DCX.DigInTrig — Method

Syntax **`ATS2.DCX.DigInTrig`**

Description Causes a restart of the reading cycle and zeros the ready count for the `ATS2.DCX.DigInRdg` command. The reading in progress is aborted.

See Also `ATS2.DCX.DigInRdg, ATS2.DCX.DigInReady, ATS2.DCX.DigInSettling`

Example See example for `ATS2.DCX.DigInFormat`.

ATS2.DCX.DigOut — Property

Syntax **`ATS2.DCX.DigOut(`**`ByVal` *`Unit`* `As String`**`)`**

Data Type Double

Parameter

Name	Description
`Unit`	The following units are available dec, hex, oct, h(x).

Description This command sets the value of the DCX's digital output.

The output format is either two's complement or BCD as set by the `ATS2.DCX.DigOutFormat` command.

Example See example for `ATS2.DCX.DigInFormat`.

ATS2.DCX.DigOutFormat — Property

Syntax **`ATS2.DCX.DigOutFormat`**

Data Type Constant

apbDcx2sComp

2's Complement

apbDcxBCD

BCD

Description This command sets the format of the digital output.

The digital ports are 21 bits plus a sign bit.

The normal format is two's complement. This format combines the bits into a 22 bit word that follows normal two's complement conventions (-1 is represented as 3FFFFF hex).

The BCD (Binary coded decimal) format is a signed magnitude representation (-1 is represented as 200001 hex, -10 is 200010 hex, etc.). As is normal in the BCD format, each decimal digit is represented by 4 bits.

Example See example for `ATS2.DCX.DigInFormat`.

ATS2.DCX.DigOutScale Property

Syntax **`ATS2.DCX.DigOutScale`**

Data Type Double

Description When h(x) units are selected at the Digital Output control field, ATS software computes the actual transmitted value from the relationship

output value = entry value* Scale (h)

where entry value is the decimal value entered into the Digital Out numeric field and Scale (h) is the value entered in the Scale (h) field just below the Digital Out control field.

Example See example for `ATS2.DCX.DigInFormat`.

ATS2.DCX.DmmMode Property

Syntax **`ATS2.DCX.DmmMode`**

Data Type Constant

apbDcxOff

Off

This command disconnects the DMM from the front panel jacks.

This allows the DMM to be wired to the circuit under test yet not be connected until needed. This is so that there is no possibility of the DMM input characteristics degrading the results of any other measurements being made ATS.

apbDcxDCV

DC Volts

apbDcxOhms

Ohms

Description This command sets the DMM measurement mode.

Example

```
Sub Main
  ATS.Application.PanelOpen(apbDCX, apbLarge)
  ATS2.DCX.DmmRange = 2.0
  ATS2.DCX.DmmMode = apbDcxDCV
  ATS2.DCX.DmmRdgRate = apbDcxRdgRate_6
  ATS2.DCX.DmmSettling(1, .20, "Vdc", 3, .03,
apbNone)
  ATS2.DCX.DmmTrig
  Do
  Loop Until ATS2.DCX.DmmReady
  Reading1 = ATS2.DCX.DmmRdg("Vdc")
  a$= "DMM Reading " & Left(Str$(Reading1),6) & "Vdc"
  ATS.Prompt.Text = a$ + vbCR
  ATS.Prompt.ShowWithContinue
  Beep
  Stop
End Sub
```

Comment This macro sets the DMM to volts, selects 2 Volt range, sets the reading rate, sets settling, triggers a New reading, waits For the New reading, and stores it In a variable called Reading1.

ATS2.DCX.DmmOffset Property

Syntax `ATS2.DCX.DmmOffset`

Data Type Double

Description When f(V) (function of Volts) or f(O) (function of Ohms) units are selected for the DMM, ATS software computes the value to display from the formula

```
display = (measurement + Offset) * Scale
```

The measurement term is the value which would be displayed in Volts or Ohms units. The Offset and Scale values are the contents of the fields with those names, at the top right of the DCX panel.

See Also `ATS2.DCX.DmmScale`

Example See example for `ATS2.DCX.DmmMode`.

ATS2.DCX.DmmRange Property

Syntax `ATS2.DCX.DmmRange`

Data Type Double

Description This command sets the DMM's input range and returns the nominal full scale of range in use.

The ranges for Ohms mode are:

2M, 200k, 20k, 2k, 200 Ohms

The ranges for Volts mode are:

500, 200, 20, 2.0, 0.2 Volts

A common use of this command is in fixing the input range by obtaining the range and then using that value for this command.

Example See example for `ATS2.DCX.DmmMode`.

ATS2.DCX.DmmRangeAuto Property

Syntax **ATS2.DCX.DmmRangeAuto**

Data Type Boolean

True	Auto range
False	Fixed range

Description This command sets the DCX-127 DMM input to Auto range or fixed range. Care must be taken when using Fixed range that the input signal does not exceed the selected range.

See Also ATS2.DCX.DmmRange

Example

```
Sub Main
   ATS.Application.PanelOpen(apbDCX, apbLarge)
   ATS2.DCX.DmmRangeAuto = True
   ATS2.DCX.DmmMode = apbDcxDCV
   ATS2.DCX.DmmRdgRate = apbDcxRdgRate_25
   ATS2.DCX.DmmScale = 2
   ATS2.DCX.DmmOffset = 1
   ATS2.DCX.DmmSettling(1, .20, "Vdc", 3, .03,
apbNone)
   ATS2.DCX.DmmTrig
   Do
   Loop Until ATS2.DCX.DmmReady
   Reading1 =  ATS2.DCX.DmmRdg("f(v)")
   a$= "DMM Reading " & Left(Str$(Reading1),6) _
      & "f(V)"
   ATS.Prompt.Text = a$ + vbCR
   ATS.Prompt.ShowWithContinue
   Beep
   Stop
End Sub
```

ATS2.DCX.DmmRdg Property

Syntax **ATS2.DCX.DmmRdg(**ByVal *Unit* As String**)**

Data Type Variant

Parameter	Name	Description
	Unit	The following units are available VDC, V(f) for the `ATS2.DCX.DmmMode` command DCV mode and Ohms, and f(O) for the Ohms mode.

Description This command returns a settled reading for the DCX-127 Digital Multi meter(DMM) meter and zeros the ready count.

See Also `ATS2.DCX.DmmMode, ATS2.DCX.DmmReady, ATS2.DCX.DmmSettling, ATS2.DCX.DmmTrig`

Example See example for `ATS2.DCX.DmmMode`.

ATS2.DCX.DmmRdgRate Property

Syntax **`ATS2.DCX.DmmRdgRate`**

Data Type Constant

apbDcxRdgRate_6
6 readings per second.

apbDcxRdgRate_25
25 readings per second.

Description This command sets the DMM reading rate.

Example See example for `ATS2.DCX.DmmMode`.

ATS2.DCX.DmmReady Property

Syntax **`ATS2.DCX.DmmReady`**

Data Type Integer

0	Reading not ready.
>0	Reading ready.

Description This command returns the DCX-127 DMM settled reading ready count.

Because readings do not return until a reading is ready, this command may be used to avoid waiting for a reading. This command does NOT zero the ready count and so may be called any number of times. Only a call to the `ATS2.DCX.DmmRdg` or `ATS2.DCX.DmmTrig` commands will zero the ready count.

If the reading is found to be ready, a call to the `ATS2.DCX.DmmRdg` command will be guaranteed to return quickly.

See Also `ATS2.DCX.DmmRdg, ATS2.DCX.DmmSettling, ATS2.DCX.DmmTrig`

Example See example for `ATS2.DCX.DmmMode`.

ATS2.DCX.DmmScale — Property

Syntax **`ATS2.DCX.DmmScale`**

Data Type Double

Description When f(V) (function of Volts) or f(O) (function of Ohms) units are selected for the DMM, ATS software computes the value to display from the following formula:

```
display = (measurement + Offset) * Scale
```

The measurement term is the value which would be displayed in Volts or Ohms units. The Offset and Scale values are the contents of the fields with those names, at the top right of the DCX panel.

See Also `ATS2.DCX.DmmOffset`

Example See example for `ATS2.DCX.DmmRangeAuto`.

ATS2.DCX.DmmSettling — Method

Syntax **`ATS2.DCX.DmmSettling(`**`ByVal` *`Tolerance`* `As Double, ByVal` *`Floor`* `As Double, ByVal` *`FloorUnit`* `As String, ByVal` *`Points`* `As Integer, ByVal` *`Delay`* `As Double, ByVal` *`Algorithm As Constant`*`)`

Parameter See Appendix A for Settling Algorithm and parameter name descriptions.

Description This command sets the settling parameters for the `ATS2.DCX.DmmRdg` command.

See Also `ATS2.DCX.DmmRdg, ATS2.DCX.DmmReady, ATS2.DCX.DmmTrig`

Example See example for `ATS2.DCX.DmmMode`.

ATS2.DCX.DmmTrig — Method

Syntax **`ATS2.DCX.DmmTrig`**

Description Causes a restart of the reading cycle and zeros the ready count for the `ATS2.DCX.DmmRdg` command. The reading in progress is aborted.

See Also `ATS2.DCX.DmmRdg, ATS2.DCX.DmmReady, ATS2.DCX.DmmSettling`

Example See example for `ATS2.DCX.DmmMode`.

ATS2.DCX.GateDelay — Property

Syntax **`ATS2.DCX.GateDelay`**

Data Type Double Valid settings are from 0.05 to 12.75 sec.

Description This command sets the delay time for the delayed sweep gate, pin #1 on the DCX-127 Program Control Output port transitions low after the defined delay.

Note: When using long delays the sweep duration must be longer than the programmed delay for pin #1 to respond.

Example

```
Sub Main
  ATS.Application.NewTest
  ATS.Application.PanelOpen(apbDCX, apbLarge)
```

```
  ATS2.DCX.GateDelay = 0.1
  ATS2.AGen.OutputOn = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS.Sweep.Start
End Sub
```

ATS2.DCX.PortOutput Property

Syntax `ATS2.DCX.PortOutput(ByVal Port As Constant, ByVal Unit As String)`

Data Type Long — The number can be from 0 to 255. Larger numbers are truncated to 8 bits. This value can only be expressed as a decimal value.

Parameter

Name	Description
Port	apbDcxA = Port A apbDcxB = Port B apbDcxC = Port C apbDcxD = Port D (J141)
Unit	The following units are available: dec, hex, oct.

Description This command sets DCX-127 Ports A through D 8-bit output value.

Example

```
Sub Main
  ATS.Application.PanelOpen(apbDCX, apbLarge)
  ATS2.DCX.PortOutput(apbDcxA, "Dec") = 17
  ATS2.DCX.PortOutput(apbDcxB, "Hex") = 34
  ATS2.DCX.PortOutput(apbDcxC, "Oct") = 68
  ATS2.DCX.PortOutput(apbDcxD, "Oct") = 68
End Sub
```

Chapter 23

Digital Generator

ATS2.DGen.Ampl — Property

Syntax `ATS2.DGen.Ampl(ByVal Channel As Constant, ByVal Unit As String)`

Data Type Double — Valid amplitude settings are 0.0 to 100 %FS.

Parameter

Name	Description
Channel	apbChA = Select channel A apbChB = Select channel B
Unit	String that designates the desired unit. The following units are valid for this command: FFS, %FS, dBFS, PPM, Bits, Vrms, Vp, Vpp, dBu, dBV, dBr

Description This command sets the Digital Generator specified channel amplitude.

See Also `ATS2.DGen.Ampl, ATS2.DGen.RefVFS`

Example

```
Sub Main
  ATS.Application.NewTest
  ATS.Application.PanelClose(apbAnalogGen)
  ATS.Application.PanelOpen(apbDigitalGen, apbLarge)
  ATS2.DGen.Wfm.Sine.Stereo
  With ATS2.DGen
     .RefVFS("V") = 2
     .RefFreq("Hz") = 10e3
     .RefdBr("FFS") = 0.5
     .ChBTrackA = False
     .Freq(apbChA, "%Hz") = 50
     .Freq(apbChB, "%Hz") = 75
     .Ampl(apbChA, "dBr") = 0.5
     .Ampl(apbChB, "dBr") = 0.5
     .Invert(apbChA) = False
```

```
        .Invert(apbChB) = False
        .Output(apbChA) = True
        .Output(apbChB) = True
        .DitherType = apbDGenTriangular
        .OutputOn = True
    End With

    ATS2.Dio.InFormat = apbDioInGenMon
    With ATS2.Inst.Analyzer.InputFormat = _
          apbInstInDigital
       Do While (.LevelReady(apbChA) = False) Or _
          (.LevelReady(apbChB) = False) Or _
          (.FreqReady(apbChA) = False) Or _
          (.FreqReady(apbChB) = False)
       Loop
       msg = "Ch A Level = " & Format _
          (.LevelRdg(apbChA, "V"), "#.00") & Chr(13)
       msg = msg & "Ch B Level = " & Format _
          (.LevelRdg(apbChB, "V"), "#.00") & Chr(13)
       msg = msg & "Ch A Freq = " & Format _
          (.FreqRdg(apbChA, "Hz"), "#.00") & Chr(13)
       msg = msg & "Ch B Freq = " & Format _
          (.FreqRdg(apbChB, "Hz"), "#.00")
    End With
    ATS.Prompt.Text = msg
    ATS.Prompt.ShowWithContinue
    Stop
End Sub
```

ATS2.DGen.AutoOn — Property

Syntax **ATS2.DGen.AutoOn**

Data Type Boolean

True	ON, Auto On feature active.
False	OFF, Auto On feature disabled.

Description This command enables the Auto On feature for the Digital Generator. Auto On switches the generator output ON when a sweep starts, and OFF when a sweep terminates.

ATS2.DGen.BurstInterval Property

Syntax `ATS2.DGen.BurstInterval(ByVal Unit As String)`

Data Type Double — 2 - 65536 cycles or equivalent period based on sine waveform frequency.

Parameter

Name	Description
Unit	String that designates the desired unit. The following units are valid for this command: Cycles, sec

Description This command sets the number of cycles between the start of a burst and the start of the following burst. This number may be from 2 to 65535 cycles and must be greater than the number of ON cycles. If the number of cycles attempted is not greater than the ON cycles, the interval is not changed.

Note that the interval will occur immediately when this command is called if the burst is running.

See Also `ATS2.DGen.Wfm, ATS2.DGen.BurstLevel, ATS2.DGen.BurstOnTime`

Example

```
Sub Main
  ATS.Application.NewTest
  ATS.Application.PanelClose(apbAnalogGen)
  ATS.Application.PanelOpen(apbDigitalGen, apbLarge)
  ATS2.DGen.Wfm.Sine.Burst
  ATS2.DGen.Output = True
  ATS2.DGen.BurstInterval("Cycles") = 10
  ATS2.DGen.BurstOnTime("Cycles") = 5
  ATS2.DGen.BurstLevel("dB") = -40
  Interval = ATS2.DGen.BurstInterval("Cycles")
  Ontime = ATS2.DGen.BurstOnTime("Cycles")
  Level = ATS2.DGen.BurstLevel("%")
  Debug.Print "Burst Interval = " & Interval & _
     " cycles."
```

```
   Debug.Print "Burst ON time = " & Ontime & " _
      cycles."
   Debug.Print "Burst OFF time low level = " & _
      Format(Level, "0.0") & " %."
End Sub
```

Output

```
Burst Interval = 10 cycles.
Burst ON time = 5 cycles.
Burst OFF time low level = 1.0 %.
```

ATS2.DGen.BurstLevel — Property

Syntax **ATS2.DGen.BurstLevel(**ByVal *Unit* As String**)**

Data Type Double — Level of signal during burst off time. (0 - -80.25dB)

Parameter

Name	Description
Unit	The following units are available X/Y, dB, %, PPM.

Description This command sets the amplitude of the Digital Generator during the burst 'off' time. This is as a percentage of the 'on' amplitude and may range from 100.0 percent to .009716280 percent (-80.25 dB).

See Also ATS2.DGen.Wfm, ATS2.DGen.BurstInterval, ATS2.DGen.BurstOnTime

Example See example for ATS2.DGen.BurstInterval.

ATS2.DGen.BurstOnTime — Property

Syntax **ATS2.DGen.BurstOnTime(**ByVal *Unit* As String**)**

Data Type Double — From 1 to ATS2.AGen.BurstInterval - 1.

Parameter

Name	Description
Unit	String that designates the desired unit. The following units are valid for this command: Cycles, sec

Description This command sets the number of cycles for the Digital Generator Burst On Time. This number may be from 1 to 65534 cycles and must be less than the number of interval cycles. If the number of

cycles attempted is not less than the interval cycles, the ON time is not changed.

See Also `ATS2.DGen.Wfm, ATS2.DGen.BurstInterval, ATS2.DGen.BurstLevel`

Example See example for `ATS2.DGen.BurstInterval`.

ATS2.DGen.ChBTrackA — Property

Syntax **`ATS2.DGen.ChBTrackA`**

Data Type Boolean

`True`	ON, channel B amplitude tracks channel A amplitude.
`False`	OFF, channel B amplitude independent of channel A.

Description This command sets the Digital Generator channel B amplitude to the same amplitude as set for channel A.

See Also `ATS2.DGen.Ampl, ATS2.DGen.Ampl`

Example See example for `ATS2.DGen.Ampl`.

ATS2.DGen.DitherType — Property

Syntax **`ATS2.DGen.DitherType`**

Data Type Constant

`apbDGenTriangular`

Triangular: probability function dither has no noise modulation effect but produces a slightly worse output signal to noise ratio since its maximum amplitude is one LSB. This is normally the preferred choice.

`apbDGenRectangular`

Rectangular: probability function dither provides the best signal to noise due to its one-half LSB amplitude, but suffers from modulation noise effects.

apbDgenShaped

Shaped: is triangular probability distribution noise with a rising 6 dB/octave slope. This places most of the dither power at higher frequencies where some falls out of band of most devices and where the human hearing system is less sensitive.

apbDgenNone

None:

Description This command sets the Digital Generator Dither Type.

Dither amplitude is automatically set corresponding to the LSB of the value selected in the Output Resolution field or by the `ATS2.Dio.OutResolution` command.

Dither is random noise of one-half LSB (rectangular) or one LSB (triangular) in amplitude, added to the digital output to improve linearity, reduce distortion, and extend the dynamic range downwards below the theoretical undithered value. The amplitude at which dither is added is determined by the value entered in the Output Resolution field or by the `ATS2.Dio.OutResolution` command.

Example See example for `ATS2.DGen.Ampl`.

ATS2.DGen.DualAmplRatio Property

Syntax **`ATS2.DGen.DualAmplRatio(`**`ByVal` *`Unit`* `As String`**`)`**

Data Type Double — Valid settings are 0.00001% to 100%

Parameter

Name	Description
`Unit`	String that designates the desired unit. The following units are valid for this command: %, dB, PPM, X/Y

Description This command sets the Digital Generator Dual waveform amplitude ratio. The amplitude of Frequency 2 is set relative to the main frequency.

See Also `ATS2.DGen.Freq`

ATS2.DGen.EqAmpl

Property

Syntax **ATS2.DGen.EqAmpl(**ByVal *Channel* As Constant, ByVal *Unit* As String**)**

Data Type Double — Valid amplitude settings are 0.0 to 100 %FS.

Parameter

Name	Description
Channel	apbChA = Select channel A apbChB = Select channel B
Unit	String that designates the desired unit. The following units are valid for this command: FFS, %FS, dBFS, PPM, Bits, Vrms, Vp, Vpp, dBu, dBV, dBr

Description This command sets the Digital Generator post Eq amplitude.

See Also ATS2.DGen.EqCurve

Example

```
Sub Main
  ATS.Application.NewTest
  ATS.Application.PanelClose(apbAnalyzer)
  ATS.Application.PanelClose(apbAnalogGen)
  ATS.Application.PanelOpen(apbDigitalGen, apbLarge)
  ATS2.DGen.Ampl(apbChA, "dBFS") = -1.0
  ATS2.DGen.Ampl(apbChB, "dBFS") = -1.0
  ATS2.DGen.EqCurve("75us-de.atsq", 1)
  ATS2.DGen.Wfm.Sine.EQ
  ATS2.DGen.EqAmpl(apbChA, "dBFS") = -1.0
  ATS2.DGen.EqAmpl(apbChB, "dBFS") = -1.0
  ATS2.DGen.OutputOn = True
  ATS.Sweep.Data(1).Id = 6014
  ATS.Sweep.Data(1).Top("dBFS") = 0.0
  ATS.Sweep.Data(1).Bottom("dBFS") = -25.0
  ATS.Sweep.Source(1).Id = 5102
  ATS.Sweep.Stereo = True
  ATS.Sweep.Start
End Sub
```

ATS2.DGen.EqCurve — Method

Syntax `ATS2.DGen.EqCurve(ByVal FileName As String, ByVal Column As Integer)`

Parameter	Name	Description
	FileName	Long Path and File Names permitted up to 128 characters. The file must be an ATS Eq file (.adq).
	Column	0 = Source 1 settings. 1 = Data 1 measurements. 2 = Data 2 measurements. 3 = Data 3 measurements. 4 = Data 4 measurements. 5 = Data 5 measurements. 6 = Data 6 measurements. 7 = Source 2 settings.

Result Boolean

True	File open successful.
False	File open failed.

Description This command attaches a Eq file to the Digital Generator. Values in the file will be used as multiply factors in czlculating the Digital Generator Amplitude values.

See Also `ATS2.DGen.EqAmpl`

Example See example for `ATS2.DGen.EqAmpl`.

ATS2.DGen.EqCurveColumn — Get Only Property

Syntax `ATS2.DGen.EqCurveColumn(ByVal Data As Integer)`

Data Type Integer — Column number.

Parameter	Name	Description
	Data	Number of the Sweep Data (1-6) of the data in memory.

Description This command returns the column number in the attached file used in the Digital Generator EqCurve waveform selection.

See Also `ATS.Sweep.Data.AutoDiv, ATS.Sweep.Data.LogLin`

ATS2.DGen.EqCurveFilename — Get Only Property

Syntax **`ATS2.DGen.EqCurveFilename`**

Data Type Integer — Any valid DOS filename and extension.

Description This command returns the File Name of the attached file used for the Digital Generator EqCurve waveform selection.

See Also `ATS2.DGen.EqCurve, ATS2.DGen.EqCurveColumn`

ATS2.DGen.Freq — Property

Syntax **`ATS2.DGen.Freq(`**`ByVal` *`Channel`* `As Constant, ByVal` *`Unit`* `As String`**`)`**

Data Type Double — Valid frequency settings for the Hz unit and sine waveform are 10 - 22.5kHz for the 48kHz sample rate.

Parameter

Name	Description
`Channel`	apbChA = Select channel A apbChB = Select channel B
`Unit`	String that designates the desired unit. The following units are valid for this command: Hz, F/R, dHz, %Hz, cent, octs, decs, d%, dPPM

Description This command sets the Digital Generator frequency for the Sine waveforms.

ATS2.DGen.IMFreq — Property

Syntax **`ATS2.DGen.IMFreq(`**`ByVal` *`Unit`* `As String`**`)`**

Data Type Double — For a SMPTE mode waveform, this is the lower frequency tone. The following frequency range is available for SMPTE and CCIF IMD waveforms for the 48kHz sample rate:

10 Hz to 22.5kHz.

Parameter	Name	Description
	Unit	String that designates the desired unit. The following unit is valid for this command. Hz

Description This command sets the Digital Generator IMD frequency. The frequency passed is rounded to the closest available value.

Set the Digital Generator waveform to IMD (SMPTE/DIN) before calling this command.

See Also `ATS2.DGen.Wfm, ATS2.DGen.IMCenterFreq`

ATS2.DGen.IMHighFreq Property

Syntax **`ATS2.DGen.IMHighFreq(`**`ByVal` *`Unit`* `As String`**`)`**

Data Type Double

Parameter	Name	Description
	Unit	String that designates the desired unit. The following unit is valid for this command. Hz

Description This command sets the Digital Generator IMD High Frequency. The frequency passed is rounded to the closest available value.

Set the Digital Generator waveform to an IMD SMPTE/DIN before calling this command.

See Also `ATS2.DGen.Wfm, ATS2.DGen.IMFreq`

ATS2.DGen.Invert Property

Syntax

ATS2.DGen.Invert(`ByVal` *`Channel`* `As Constant`**)**

Data Type Boolean

True	Invert channel A output.
False	Normal non-inverting output.

Parameter	Name	Description
	Channel	apbChA = Select channel A apbChB = Select channel B

Description This command sets the selected channel output to normal polarity or inverted polarity (180 degrees out of phase).

Example

```
See example for ATS2.DGen.Ampl.
```

ATS2.DGen.Offset Property

Syntax

```
ATS2.DGen.Offset(ByVal Unit As String)
```

Data Type Double

Parameter	Name	Description
	Unit	String that designates the desired unit. The following units are valid for this command: FFS, %FS, dBFS, Bits, Vrms, Vp, Vpp, dBu, dBV, dBr, dBrInv

Description This command sets the Digital Generator Sine + Offset waveform Offset value.

See Also

```
ATS2.DGen.Wfm
```

ATS2.DGen.Output Property

Syntax

```
ATS2.DGen.Output(ByVal Channel As Constant)
```

Data Type Boolean

True	ON.
False	OFF.

Parameter	Name	Description
	Channel	apbChA = Select channel A apbChB = Select channel B

Description This command sets the Digital Generator Output to ON or OFF.

The command returns a TRUE if the output is ON and FALSE if the output is OFF.

See Also `ATS2.DGen.OutputOn`

Example See example for `ATS2.DGen.Ampl`.

ATS2.DGen.OutputOn — Property

Syntax **`ATS2.DGen.OutputOn`**

Data Type Boolean

True	On
False	Off

Description This command sets the Digital Generator channel A and B outputs to ON or OFF if they have been individually enabled by the `ATS2.DGen.Output` command.

See Also `ATS2.DGen.Output`

Example See example for `ATS2.DGen.Ampl`.

ATS2.DGen.Phase — Property

Syntax **`ATS2.DGen.Phase(`**`ByVal` *`Unit`* `As String`**`)`**

Data Type Double

Parameter

Name	Description
Unit	String that designates the desired unit. The following units are valid for this command: deg

Description This command sets the Digital Generator Phase value.

Set the Digital Generator waveform to Sine Var Phase before calling this command.

See Also `ATS2.DGen.Wfm`

Example

```
Sub Main
  ATS.Application.NewTest
  ATS.Application.PanelClose(apbAnalogGen)
  ATS.Application.PanelOpen(apbDigitalGen, apbSmall)
  ATS2.DGen.WfmSine.VarPhase
  ATS2.DGen.Phase("deg") = 90.0
  ATS2.DGen.OutputOn = True
  ATS2.Dio.InFormat = apbDioInGenMon
  ATS2.Inst.Analyzer.InputFormat = apbInstInDigital
  ATS2.Inst.Analyzer.FuncMode = apbAnlrPhase
  ATS.Sweep.Data(1).Id = 6365
  ATS.Sweep.SinglePoint = True
  ATS.Sweep.Start
  Debug.Print "Channel B is " &
Format(ATS.Data.Value(0,1,0,"deg"),"##.000") & " deg
relative to channel A"
End Sub
```

Output

```
Channel B is 90.001 deg relative to channel A.
```

ATS2.DGen.RefdBr — Property

Syntax `ATS2.DGen.RefdBr(ByVal Unit As String)`

Data Type Double — Amplitude value.

Parameter

Name	Description
Unit	String that designates the desired unit. The following units are valid for this command: FFS, %FS, dBFS, Bits, V, Vp, Vpp, dBu, dBV

Description This command sets the zero dBr value for the Digital Generator dBr unit.

See Also `ATS2.DGen.Ampl, ATS2.DGen.RefVFS`

Example See example for `ATS2.DGen.Ampl`.

ATS2.DGen.RefFreq

Property

Syntax `ATS2.DGen.RefFreq(ByVal Unit As String)`

Data Type Double

Parameter

Name	Description
Unit	String that designates the desired unit. The following unit is valid for this command: Hz

Description This command sets the Digital Generator relative frequency reference value. This reference is used for all the Digital Generator relative frequency units (F/R, dHz, %Hz, cent, octs, decs, d%, dPPM)

See Also `ATS2.DGen.Freq`

Example See example for `ATS2.DGen.Ampl`.

ATS2.DGen.RefVFS

Property

Syntax `ATS2.DGen.RefVFS(ByVal Unit As String)`

Data Type Double

Parameter

Name	Description
Unit	String that designates the desired unit. The following unit is valid for this command: V

Description This command sets the Digital Generator relative Volts Full Scale (VFS) reference value. This reference is used for all the Digital Generator relative amplitude units (Vrms, Vp, Vpp, dBu, dBV)

Example See example for `ATS2.DGen.Ampl`.

ATS2.DGen.StepRate

Property

Syntax `ATS2.DGen.StepRate`

Data Type Double

Description This command sets the rate at which the Digital Generator Special Walking Ones, and Walking Zeros waveform changes state. If the `ATS2.DGen.StepRate` command is set to 5 the Digital Generator will output five words with the same bit pattern and then change to the next bit pattern.

See Also `ATS2.DGen.Wfm`

ATS2.DGen.Wfm — Method

Syntax **`ATS2.DGen.Wfm.`***`Primary.Secondary`*

Part

Name	Description
`Primary`	This part defines the basic waveform type.
`Secondary`	This part defines the basic waveform modifier.

Primary	Secondary	Description
.Sine	.Normal	Sine Normal
	.VarPhase	Sine Var Phase
	.Stereo	Sine Stereo
	.Dual	Sine Dual
	.ShapedBurst	Sine Shaped Burst
	.EQSine	EQ Sine
	.Burst	Sine Burst
	.SinePlusDC	Sine + Offset
.IMD	.SMPTE_4_1	SMPTE/DIN 4:1
	.SMPTE_1_1	SMPTE/DIN 1:1
.Square		Square.
.Noise		Noise
.Arbitrary		Arb Wfm
.Special	.Polarity	Polarity
	.Monotonicity	Monotonicity
	.PassThru	Pass Thru
	.JTest	J-Test

.WalkingOnes	Walking Ones
.WalkingZeros	Walking Zeros
.Constant	Constant Value
.Random	Random

Description This command sets the Digital Generator waveform. The table above shows the possible settings for the `ATS2.DGen.Wfm` command.

Example See example for `ATS2.DGen.WfmName`.

ATS2.DGen.WfmName Property

Syntax **`ATS2.DGen.WfmName`**

Data Type String Long Path and File Names permitted up to 128 characters.

Description This command loads the designated arbitrary waveform file (.AGM or .AGS) into the Digital Generator. A Mono waveform (.AGM) is loaded into both the 1 and 2 generator buffers.

Buffer 1 : This buffer is associated with the DSP channel 1.

Buffer 2 : This buffer is associated with the DSP channel 2.

Note: This command can also be used to control the Analog Generator arbitrary waveform file selection.

See Also `ATS2.DGen.Wfm`

Example

```
Sub Main
  ATS.Application.NewTest
  ATS.Application.PanelClose(apbAnalogGen)
  ATS.Application.PanelClose(apbAnalogInput)
  ATS.Application.PanelOpen(apbDigitalGen, apbSmall)
  ATS.Application.PanelOpen(apbAnalyzer, apbSmall)
  ATS.Application.PanelOpen(apbDigIO, apbSmall)
  ATS2.Inst.Selection = apbInstFastTestAnalyzer
  ATS2.Inst.FastTest.InputFormat = apbInstInDigital
  ATS2.Dio.InFormat = apbDioInGenMon
  ATS2.DGen.Wfm.Arbitrary
  ATS2.DGen.WfmName = "48kMulTone31.agm"
```

```
    ATS2.DGen.OutputOn = True
    ATS.Application.PanelOpen(apbSweep. apbSmall)
    ATS.Sweep.Data(1).Id = 6309
    ATS.Sweep.Data(1).Top("dBFS") = 0.000000
    ATS.Sweep.Source(1).Id = 5621
    ATS.Sweep.Source(1).Steps = 200
    ATS.Sweep.Stereo = True
    ATS.Sweep.Start
    ATS.Graph.OptimizeLeft
End Sub
```

Chapter 24

Digital Input/Output

ATS2.Dio.FlagInvalidRdg — Method

Syntax **ATS2.Dio.FlagInvalidRdg[(**ByVal *Channel* As Constant**)]**

Result Boolean

True	Error
False	Proper operation

Parameter

Name	Description
Channel	apbChA = Select channel A apbChB = Select channel B

Description This reading uses OR logic to determine if either the channel A or channel B Validity bit is set.

When using the optional parameter this reading returns the state of the Validity bit for the specified channel.

The reading is driven directly by the V (Validity) bit defined in the Professional and Consumer standards. One Validity bit is sent in each subframe

See Also ATS2.Dio.OutSendInvalid

Example

```
Sub Main
  ATS.Application.NewTest
  ATS.Application.PanelOpen(apbDigIO, apbSmall)
  ATS2.Dio.InFormat = apbDioInGenMon
  ATS.Application.PanelOpen(apbDigIO ,apbLarge)
  ATS2.Dio.OutSendInvalid = True
  Wait 1
  If ATS2.Dio.FlagConfidenceRdg = True Then _
```

```
      Debug.Print "Confidence Error"
   If ATS2.Dio.FlagLockRdg = True Then _
      Debug.Print "Lock Error"
   If ATS2.Dio.FlagCodingRdg = True Then _
      Debug.Print "Coding Error"
   If ATS2.Dio.FlagParityRdg = True Then _
      Debug.Print "Parity Error"
   If ATS2.Dio.FlagInvalidRdg(apbChA) = True Then _
      Debug.Print "ChA Invalid Error"
   If ATS2.Dio.FlagInvalidRdg(apbChB) = True Then _
      Debug.Print "ChB Invalid Error"
End Sub
```

ATS2.Dio.FlagCodingRdg — Method

Syntax `ATS2.Dio.FlagCodingRdg`

Result Boolean

True	Error
False	Proper operation

Description This reading returns the status of the biphase coding for the input serial data stream. The Coding reading indicates a deviation from proper biphase coding in the input serial stream (ignoring preambles). Proper biphase signals can never remain at a logic high or logic low level for more than two consecutive Unit Intervals (UI) except in the preamble. The preamble deliberately deviates from biphase coding in order to provide a unique frame synchronization signal, so preambles are excluded from the function of the Coding indicators.

Example See example for `ATS2.Dio.FlagInvalidRdg`.

ATS2.Dio.FlagConfidenceRdg — Method

Syntax `ATS2.Dio.FlagConfidenceRdg`

Result Boolean

True	Error
False	Proper operation

Description The Confidence reading returns True when the ratio between the amplitude of the three UI long pulse and the following one UI-long pulse in a preamble becomes large enough to cause an increasing probability of errors when slicing the received signal into logic high and low values. This large ratio occurs when the transmission bandwidth has been reduced to marginal or unacceptable values. Under these conditions, selection of hardware input equalization (XLR with EQ or BNC with EQ rather than XLR or BNC selections of the Input Format field) will often compensate for the cable bandwidth reduction, and provide reliable measurements.

Example See example for `ATS2.Dio.FlagInvalidRdg`.

ATS2.Dio.FlagLockRdg Method

Syntax **`ATS2.Dio.FlagLockRdg`**

Result Boolean

True	Error
False	Proper operation

Description The Lock reading indicates when the digital input phase-locked loop is unable to lock to the incoming signal.

Example See example for `ATS2.Dio.FlagInvalidRdg`

ATS2.Dio.FlagParityRdg Method

Syntax **`ATS2.Dio.FlagParityRdg`**

Result Boolean

True	Error
False	Proper operation

Description The Parity reading indicates a parity error in either subframe. Correct parity is determined by comparing the P (parity) bit with the sum of the remaining 31 bits in each subframe. Any single bit error or odd number of bit errors introduced in transmission within a subframe will cause a Parity error indication, but even numbers of bit errors cannot be detected by this technique.

Example See example for `ATS2.Dio.FlagInvalidRdg`

ATS2.Dio.InBitsDisplay Property

Syntax **`ATS2.Dio.InBitsDisplay`**

Data Type Constant

`apbDioData`
Display Data bits.

`apbDioActive`
Display Active bits.

Description This command sets the Digital Input/Output Input Bits Display mode.

ATS2.Dio.InDecode Property

Syntax **`ATS2.Dio.InDecode`**

Data Type Constant

`apbDioCodeBits`
No data compression applied.

`apbDioCodeU_Law`
Apply μ-Law decoding to data signal.

`apbDioCodeA_Law`
Apply A-Law decoding to data signal.

Description This command selects the Digital Interface Receive Data Format Expansion.

See Also `ATS2.Dio.OutEncode`

Example

```
Sub Main
  ATS2.Dio.InDecode = 1    'µ-Law decode
End Sub
```

ATS2.Dio.InDeEmp Property

Syntax **`ATS2.Dio.InDeEmp`**

Data Type Constant

apbDioInOff
: Off

apbDioIn_50
: 50/15us 0dB

apbDioIn_50_12
: 50/15us + 12dB

apbDioIn_J17
: J17 0dB

apbDioIn_J17_20
: J17 + 20dB

Description This command selects the Digital Input/Output input deemphasis. CD type (50/15 us) or CCITT J17 deemphasis may be selected as desired. Either deemphasis characteristic may be selected with either zero dB insertion loss at low frequencies (0 dB selections in each case) or with a gain factor (+12 dB for 50/15us, +20 dB for J17) to compensate for the matching headroom allowances of the ATS-2 Digital Generator preemphasis `ATS2.Dio.OutPreEmp` capability.

See Also `ATS2.Dio.OutPreEmp`

Example See example for `ATS2.Dio.OutFormat`.

ATS2.Dio.InFormat

Property

Syntax `ATS2.Dio.InFormat`

Data Type Constant

apbDioInXLR
: XLR (Bal): Front panel XLR digital input connector, balanced

apbDioInBNC
: BNC (unbal): Front panel BNC digital input connector, unbalanced

apbDioInOptical
: Optical: Front panel Toslink optical input connector

apbDioInGenMon
: Gen Mon: Digital Generator XLR or BNC output connector

apbDioInDualXLR
: Dual XLR (bal)

Description This command sets the Digital Input/Output Input Format.

Example See example for `ATS2.Dio.PeakRdg`

ATS2.Dio.InImpedance

Property

Syntax `ATS2.Dio.InImpedance`

Data Type Constant

The following list contains the selections relevant to the `ATS2.Dio.InFormat` command XLR (Bal), and Dual XLR (Bal) selections.

apbDioInHighZ
: High Impedance

apbDioInLowZ
: 110 Ohms

The following list contains the selections relevant to the `ATS2.Dio.InFormat` command BNC (unbal) selection.

apbDioInHighZ
: High Impedance

apbDioInLowZ
: 75 Ohms

Description This command sets the Digital Input/Output Input Impedance based on the selection for the `ATS2.Dio.InFormat` command.

Example See example for `ATS2.Dio.PeakRdg`

ATS2.Dio.InInput — Property

Syntax **`ATS2.Dio.InInput`**

Data Type Constant

apbDioIn_I
: Select channel I XLR Input.

apbDioIn_II
: Select channel II XLR Input.

Description This command selects the Digital Input/Output Input connector. When the Digital Input/Output Input Format is set by the `ATS2.Dio.InFormat` command to any of the XLR selection this command servies as an input switcher to select from one connector (I) or the other (II).

Example See example for `ATS2.Dio.InJitterBW`.

ATS2.Dio.InJitterBW — Property

Syntax **`ATS2.Dio.InJitterBW`**

Data Type Constant

apbDioIn_50to100k
: 50Hz to 100kHz

apbDioIn_120to100k
120Hz to 100kHz

apbDioIn_700to100k
700Hz to 100kHz

apbDioIn_1200to100k
1200Hz to 100kHZ

Description This command sets the Digital Input/Output Input bandwidth of the Interface Jitter `ATS2.Dio.JitterRdg` meter.

Example

```
Sub Main
  Dim rdg As Double
  ATS2.Dio.OutJitterType = apbDioOutJitterSine
  ATS2.Dio.OutJitterAmpl("UI") = 5.0
  ATS2.Dio.OutJitterFreq("Hz") = 2e3
  ATS2.Dio.InInput = apbDioIn_I
  ATS2.Dio.InJitterMode = apbDioInUI
  ATS2.Dio.InJitterDetector = apbDioInAvg
  ATS2.Dio.InJitterBW = apbDioIn_50to100k
  ATS2.Dio.JitterSettling(5.0, 1e-6, "UI", 1, 0.0,
apbNone)
  ATS2.Dio.JitterTrig
  Do Until ATS2.Dio.JitterReady
     'perform other actions while waiting for reading
     '...
  Loop
  rdg = ATS2.Dio.JitterRdg("UI")
  ATS.Prompt.Text = "Jitter = " & rdg & " UI"
  ATS.Prompt.ShowWithContinue
  Stop
End Sub
```

ATS2.Dio.InJitterDetector — Property

Syntax **`ATS2.Dio.InJitterDetector`**

Data Type Constant

apbDioInPk

Pk

apbDioInAvg

Avg

Description This command selects the Digital Input/Output Input detector type for the Interface Jitter `ATS2.Dio.JitterRdg` meter.

Example See example for `ATS2.Dio.InJitterBW`.

ATS2.Dio.InJitterMode

Property

Syntax **`ATS2.Dio.InJitterMode`**

Data Type Constant

apbDioInUI

UI: Unit interval

apbDioInSec

Sec: Time

Description This command selects the measurement mode for the Digital Input/Output Interface Jitter `ATS2.Dio.JitterRdg` meter.

Example See example for `ATS2.Dio.InJitterBW`.

ATS2.Dio.InMonitorMode

Property

Syntax **`ATS2.Dio.InMonitorMode`**

Data Type Constant

apbDioInPos

Pos. Peak: causes the Level Monitors to display the most positive value during each measurement interval, which is approximately 1/4 second.

apbDioInNeg

Neg. Peak: causes the monitors to display the most negative value during each measurement interval (dBFS

units cannot be used with the Min mode since the numbers are negative).

apbDioInPeak

Abs. Peak: causes display of the absolute value of the largest positive-going or negative-going value during each measurement interval.

apbDioInHalfPeak

1/2 Pk-Pk : causes display of the value which is one-half the peak-to-peak range measured during the measurement interval.

Description This command sets the Digital Input/Output Peak Monitor

Example See example for `ATS2.Dio.PeakRdg`.

ATS2.Dio.InResolution Property

Syntax **`ATS2.Dio.InResolution`**

Data Type Long 8 to 24 bits.

Description This command sets the Digital Input/Output Input Resolution.

See Also `ATS2.Dio.OutResolution`

Example See example for `ATS2.Dio.OutFormat`.

ATS2.Dio.InScaleFreq Property

Syntax **`ATS2.Dio.InScaleFreq`**

Data Type Constant

apbDioInOutputRate

Output Rate: is the Digital Generator output sample rate set by the Rate field near the top of the Output section of the DIO panel.

apbDioInMeasRate

Measured Rate: is the input signal sample rate value displayed in the Sample Rate field near the top of the Input section of the DIO panel.

apbDioInRcvStatBits

Status Bits A: is the value of sample frequency encoded into the received channel A status bits.

apbDioInRefRate

Dio Rate Ref: is the sample rate value defined by the `ATS2.Dio.RefRate` command.

Description This command selects a source from which the digital audio sample rate is determined. The frequency of imbedded digital audio signals must be normalized by a digital sample rate before display, whether it is displayed as a numeric frequency counter display or as a frequency component on an FFT graph.

See Also `ATS2.Dio.RefRate`

Example See example for `ATS2.Dio.OutFormat`.

ATS2.Dio.JitterRdg — Property

Syntax **`ATS2.Dio.JitterRdg(`**`ByVal` *`Unit`* `As String`**`)`**

Data Type Double

Parameter

Name	Description
`Unit`	String that designates the desired unit. The following unit is valid when the ATS2.Dio.InJitterMode command is set to UI (Unit Interval): UI The following unit is valid when the ATS2.Dio.InJitterMode command is set to Sec (Time): sec

Description This command returns a settled reading for the Digital Input/Output Interface Jitter meter and zeros the ready count.

See Also `ATS2.Dio.JitterReady, ATS2.Dio.JitterSettling, ATS2.Dio.JitterTrig, ATS2.Dio.InJitterMode`

Example See example for `ATS2.Dio.InJitterBW`.

ATS2.Dio.JitterReady — Property

Syntax **`ATS2.Dio.JitterReady`**

Data Type Integer

0	Reading not ready.
>0	Reading ready.

Description This command returns the Digital Input/Output Interface Jitter meter meter settled reading ready count.

Because readings do not return until a reading is ready, this command may be used to avoid waiting for a reading. This command does NOT zero the ready count and so may be called any number of times. Only a call to the `ATS2.Dio.JitterRdg` or `ATS2.Dio.JitterTrig` commands will zero the ready count.

If the reading is found to be ready, a call to the `ATS2.Dio.JitterRdg` command will be guaranteed to return quickly.

See Also `ATS2.Dio.JitterRdg, ATS2.Dio.JitterSettling, ATS2.Dio.JitterTrig`

Example See example for `ATS2.Dio.InJitterBW`.

ATS2.Dio.JitterSettling — Method

Syntax **`ATS2.Dio.JitterSettling(`**`ByVal` *`Tolerance`* `As Double, ByVal` *`Floor`* `As Double, ByVal` *`FloorUnit`* `As String, ByVal` *`Points`* `As Integer, ByVal` *`Delay`* `As Double, ByVal` *`Algorithm As Constant`*`)`

Parameter See Appendix A for Settling Algorithm and parameter name descriptions.

Description This command sets the settling parameters for the `ATS2.Dio.JitterRdg` command.

See Also `ATS2.Dio.JitterRdg, ATS2.Dio.JitterReady, ATS2.Dio.JitterTrig`

Example See example for `ATS2.Dio.JitterBW`.

ATS2.Dio.JitterTrig — Method

Syntax **`ATS2.Inst.`**

Description Causes a restart of the reading cycle and zeros the ready count for the `ATS2.Dio.JitterRdg` command. The reading in progress is aborted.

See Also `ATS2.Dio.JitterRdg, ATS2.Dio.JitterReady, ATS2.Dio.JitterSettling`

Example See example for `ATS2.Dio.InJitterBW`.

ATS2.Dio.OutEncode — Property

Syntax **`ATS2.Dio.OutEncode`**

Data Type Constant

`apbDioCodeBits`
No data compression applied.

`apbDioCodeU_Law`
Apply μ-Law encoding to data signal.

`apbDioCodeA_Law`
Apply A-Law encoding to data signal.

Description This command selects the Digital Interface Transmit Data Format Compression.

See Also `ATS.S2CDio.OutEncode`

Example

```
Sub Main
  ATS2.Dio.OutEncode = apbDioCodeU_Law
End Sub
```

ATS2.Dio.OutFormat

Property

Syntax **ATS2.Dio.OutFormat**

Data Type Constant

apbDioOutXLR
XLR

apbDioOutBNC
BNC

apbDioOutOptical
Optical

apbDioOutDualXLR_OSR
Dual XLR

apbDioOutDualXLR_2XOSR
Dual XLR 2xOSR

Description This command sets the Digital Input/Output Output source.

Example

```
Const INTERVU_AMPL As Integer = 6053
Const INTERVU_TIME As Integer = 5612


Sub Main
  ATS.Application.NewTest
  With ATS.S2CDio
     .OutFormat = apbDioOutXLR
     .OutRate("Hz") = 48000
     .OutResolution = 20
     .OutPreEmp = apbDioOutOff
     .InDeEmp = apbDioInOff
     .InFormat = apbDioInGenMon
     .InResolution = 20
     .InScaleFreq = apbDioInMeasRate
  End With
  ATS2.Inst.Selection = apbInstIntervuAnalyzer
  ATS2.Inst.Intervu.WfmDisplay = _
     apbIntervuInterpolate
  ATS2.Trigger.Source = apbTrigRcvChASub
  With ATS.Sweep
```

```
        .Source(1).Id = INTERVU_TIME
        .Source(1).Start("sec") = 0.0
        .Source(1).Stop("sec") = 4e-6
        .Source(1).Steps = 255
        .Data(1).Id = INTERVU_AMPL
        .Data(1).Top("V") = 3.0
        .Data(1).Bottom("V") = -3.0
        .Start
    End With
End Sub
```

ATS2.Dio.OutInvert — Property

Syntax **ATS2.Dio.OutInvert**

Data Type Boolean

True	Invert output.
False	Normal non-inverting output.

Description This command sets the Digital Output to normal polarity or inverted polarity (180 degrees out of phase).

ATS2.Dio.OutJitterAmpl — Property

Syntax **ATS2.Dio.OutInvert(**ByVal *Unit* As String**)**

Data Type Double

Parameter

Name	Description
Unit	String that designates the desired unit. The following units are valid for this command: UI, dBUI, sec.

Description This command sets the Digital Input/Output Jitter Amplitude value.

See Also ATS2.Dio.OutJitterEqCurve

Example See example for ATS2.Dio.InJitterBW.

ATS2.Dio.OutJitterEqCurve — Method

Syntax `ATS2.Dio.OutJitterEqCurve(ByVal FileName As String, ByVal Column As Integer)`

Parameter

Name	Description
FileName	Any valid DOS path and file name. The file must be an ATS Eq file (.atsq).
Column	0 = Source 1 settings. 1 = Data 1 measurements. 2 = Data 2 measurements. 3 = Data 3 measurements. 4 = Data 4 measurements. 5 = Data 5 measurements. 6 = Data 6 measurements. 7 = Source 2 settings.

Result Boolean

True	File attachment successful.
False	File attachment failed.

Description This command attaches a Eq file to the Jitter Generator. Values in the file will be used as multiply factors in calculating the Digital Input/Output Jitter Amplitude value.

See Also `ATS2.Dio.OutJitterAmpl`

ATS2.Dio.OutJitterFreq — Property

Syntax `ATS2.Dio.OutJitterFreq(ByVal Unit As String)`

Data Type Double

Parameter

Name	Description
Unit	String that designates the desired unit. The following units are valid for this command: Hz

Description This command sets the Digital Input/Output Jitter Frequency value.

Example See example for `ATS2.Dio.InJitterBW`.

ATS2.Dio.OutJitterType

Property

Syntax `ATS2.Dio.OutJitterType`

Data Type Constant

apbDioOutJitterOff
Off

apbDioOutJitterSine
Sine

apbDioOutJitterEQSine
EQ Sine

Description This command sets the type of jitter that may be added to the digital output signal at the XLR, BNC, and optical outputs to test the ability of a digital device to reject input jitter.

Example See example for `ATS2.Dio.InJitterBW`.

ATS2.Dio.OutParityError

Property

Syntax `ATS2.Dio.OutParityError`

Data Type Boolean

True	Generate Parity Error in digital output.
False	Normal output.

Description This command sets the Digital Output Parity Bit to produce a Parity Error or to normal operation.

See Also `ATS2.Dio.FlagParityRdg`

Example See example for `ATS2.Dio.FlagInvalidRdg`.

ATS2.Dio.OutPreEmp

Property

Syntax `ATS2.Dio.OutPreEmp`

Data Type Constant

apbDioOutOff
Off

apbDioOut_50
50/15us 0dB

apbDioOut_50_12
50/15us - 10dB

apbDioOut_J17
J17 0dB

apbDioOut_J17_20
J17 - 20dB

Description This command selects the Digital Input/Output Output Preemphasis.

CD type (50/15 us) or CCITT J17 deemphasis may be selected as desired. Either preemphasis function may be selected at normal gain or with a headroom allowance. When program material is put through a preemphasis function, the natural high-frequency roll-off of most music and voice signals and typical practices of headroom allowance for peaks are sufficient to assure that high-frequency signals will not clip (exceed digital full scale). However, full-scale test signals such as sinewave sweeps or multitone signals with equal amplitude at all frequencies will clip at high frequencies when preemphasis is applied. To prevent this clipping due to the high-frequency boost, two additional selections are available which automatically attenuate the signal level sufficiently to provide headroom at the highest frequencies. These headroom allowances are selected by the 50/15 us -10 dB and J17 -20 dB choices. Each will attenuate the audio signal by the specified amount, which is slightly greater than the boost at the maximum possible audio frequency for the chosen preemphasis characteristic. If desired, a matching deemphasis with gain selection is available in the Deemphasis field or via the `ATS2.Dio.InDeEmp` command of the Input section of the DIO panel to provide an overall unity gain and flat response during digital domain stimulus/response measurements.

See Also `ATS2.Dio.InDeEmp`

Example See example for `ATS2.Dio.OutFormat`.

ATS2.Dio.OutRate Property

Syntax `ATS2.Dio.OutRate(ByVal Unit As String)`

Data Type Double — The digital output sample rate of ATS may be freely set across the range from 28.8 kHz to 108 kHz.

Parameter

Name	Description
Unit	String that designates the desired unit. The following units are valid for this command: Hz, F/R, dHz, %Hz, cent, octs, decs, d%, and dPPM.

Description This command sets the Digital Output Sample Rate Frequency value.

Example See example for `ATS2.Dio.OutFormat`.

ATS2.Dio.OutResolution Property

Syntax `ATS2.Dio.OutResolution`

Data Type Integer — The width or resolution of the imbedded digital audio signal may be set to any value from 8 to 24 bits.

Description This command sets the Digital Output Resolution.

Internally, the imbedded digital audio signal is always generated at 24 bits. When any smaller value is selected in the Resolution field, the 24-bit word is rounded (not truncated) to the specified value and dither is added (unless disabled) at the proper amplitude for the value entered. Bits below the value entered in the Resolution field are set to zero. The output resolution is independent from the input resolution.

See Also `ATS2.Dio.InResolution`

Example See example for `ATS2.Dio.OutFormat`.

ATS2.Dio.OutScaleFreq Property

Syntax `ATS2.Dio.OutScaleFreq`

Data Type Constant

apbDioOutOutputRate
: Output Rate: the value in the Sample Rate-OSR field near the top of the Output section of the DIO panel.

apbDioOutMeasRate
: Measured Rate: is the input signal sample rate value displayed in the Sample Rate field near the top of the Input section of the DIO panel.

apbDioOutRefRate
: Dio Rate Ref: is the sample rate value defined by the `ATS2.Dio.RefRate` command.

Description This command sets the source for scaling for the audio frequency embedded in the digital output signal.

See Also `ATS2.Dio.RefRate`

Example

```
Sub Main
 ATS2.Dio.OutScaleFreq = 1
 'use measured input rate
End Sub
```

ATS2.Dio.OutSendInvalid — Property

Syntax **`ATS2.Dio.OutSendInvalid`**

Data Type Boolean

True	Set
False	Clear validity bit.

Description This command sets or clears the validity bit.

The AES/EBU and Consumer standards define a data invalid bit for each subframe. This is the V bit of the VUCP bits (validity, user, channel status, parity). Actual usage of this bit is not totally standardized, but a common usage in digital tape recorders (for example) is to set this bit as invalid if the tape is not moving and valid if the tape is playing. ATS permits the user to simultaneously set both

channel A and B validity bits as true (check the Send Invalid box) or false (Send Invalid box unchecked) in order to test whether and how digital devices respond to the bit.

ATS2.Dio.OutVoltage — Property

Syntax `ATS2.Dio.Voltage(ByVal Unit As String)`

Data Type Double

Parameter

Name	Description
Unit	String that designates the desired unit. The following unit is valid for this command: Vpp

Description This command sets the amplitude of the serial pulse train at the XLR, BNC and optical outputs, which may be used to simulate cable attenuation.

Example See example for `ATS2.Dio.VoltageRdg`.

ATS2.Dio.PeakRdg — Property

Syntax `ATS2.Dio.PeakRdg(ByVal Channel As Constant, ByVal Unit As String)`

Data Type Double

Parameter

Name	Description
Channel	apbChA = Select channel A apbChB = Select channel B
Unit	String that designates the desired unit. The following units are valid for this command: FFS, %FS, dBFS, Bits.

Description This command returns a unsettled reading for the Digital Input/Output Peak Monitor meter and zeros the ready count.

See Also `ATS2.Dio.PeakReady, ATS2.Dio.PeakTrig`

Example

```
Sub Main
  Dim rdgA As Double, rdgB As Double
```

```
  ATS.Application.
  ATS2.Dio.InFormat = apbDioInGenMon
  ATS2.Dio.InImpedance = apbDioInHighZ
  ATS2.Dio.InMonitorMode = apbDioInPeak
  ATS2.Dio.PeakTrig(apbChA)
  ATS2.Dio.PeakTrig(apbChB)
  Do Until (ATS2.Dio.PeakReady(apbChA) And _
  ATS2.Dio.PeakReady(apbChB))
     'perform other actions while
     'waiting for readings ...
  Loop
   = ATS2.Dio.PeakRdg(apbChA, "FFS")
   = ATS2.Dio.PeakRdg(apbChB, "FFS")
  ATS.Prompt.Text = "Ch A = " &  & " FFS" & _
     Chr(13) & "Ch B = " & rdgB & " FFS"
  ATS.Prompt.
  Stop
End Sub
```

ATS2.Dio.PeakReady — Property

Syntax **ATS2.Dio.PeakReady(**ByVal *Channel* As Constant**)**

Data Type Integer

0	Reading not ready.
>0	Reading ready.

Parameter	**Name**	**Description**
	Channel	apbChA = Select channel A apbChB = Select channel B

Description This command returns the Digital Input/Output Peak Monitor meter unsettled reading ready count.

Because readings do not return until a reading is ready, this command may be used to avoid waiting for a reading. This command does NOT zero the ready count and so may be called any

number of times. Only a call to the `ATS2.Dio.PeakRdg` command will zero the ready count.

If the reading is found to be ready, a call to the `ATS2.Dio.PeakRdg` command will be guaranteed to return quickly.

See Also `ATS2.Dio.PeakRdg, ATS2.Dio.PeakTrig`

Example See example for `ATS2.Dio.PeakRdg`.

ATS2.Dio.PeakTrig — Method

Syntax **`ATS2.Dio.PeakTrig(`**`ByVal` *`Channel`* `As Constant`**`)`**

Parameter

Name	Description
Channel	apbChA = Select channel A apbChB = Select channel B

Description Causes a restart of the reading cycle and zeros the ready count for the `ATS2.Dio.PeakRdg` command. The reading in progress is aborted.

See Also `ATS2.Dio.PeakRdg, ATS2.Dio.PeakReady`

Example See example for `ATS2.Dio.PeakRdg`.

ATS2.Dio.RateRdg — Property

Syntax **`ATS2.Dio.RateRdg(`**`ByVal` *`Unit`* `As String`**`)`**

Data Type Double

Parameter

Name	Description
Unit	String that designates the desired unit. The following units are valid for this command: Hz, F/R, dHz, %Hz, cent, octs, decs, d%, and dPPM.

Description This command returns a settled reading for the Digital Input/Output Sample Rate meter and zeros the ready count.

See Also `ATS2.Dio.RateReady, ATS2.Dio.RateSettling, ATS2.Dio.RateTrig`

Example

```
Sub Main
  Dim rdgA As Double
  ATS2.Dio.InImpedance = apbDioInHighZ
  ATS2.Dio.InFormat = apbDioInGenMon

  ATS2.Dio.RateSettling(5.0, 100e-3, "Hz", 1, 0.0,
apbNone)
  ATS2.Dio.RateTrig
  Do Until ATS2.Dio.RateReady
     'perform other actions while
     'waiting for readings ...
  Loop
  rdgA = ATS2.Dio.RateRdg("Hz")
  ATS.Prompt.Text = "Ch A = " & rdgA & " Hz"
  ATS.Prompt.ShowWithContinue
  Stop
End Sub
```

ATS2.Dio.RateReady — Property

Syntax **`ATS2.Dio.RateReady`**

Data Type Integer

0	Reading not ready.
>0	Reading ready.

Description This command returns the Digital Input/Output Sample Rate meter settled reading ready count.

Because readings do not return until a reading is ready, this command may be used to avoid waiting for a reading. This command does NOT zero the ready count and so may be called any number of times. Only a call to the `ATS2.Dio.RateRdg` or `ATS2.Dio.RateTrig` commands will zero the ready count.

If the reading is found to be ready, a call to the `ATS2.Dio.RateRdg` command will be guaranteed to return quickly.

See Also `ATS2.Dio.RateRdg, ATS2.Dio.RateSettling, ATS2.Dio.RateTrig`

Example See example for `ATS2.Dio.RateRdg`.

ATS2.Dio.RateSettling — Method

Syntax **`ATS2.Dio.RateSettling(`**`ByVal` *`Tolerance`* `As Double, ByVal` *`Floor`* `As Double, ByVal` *`FloorUnit`* `As String, ByVal` *`Points`* `As Integer, ByVal` *`Delay`* `As Double, ByVal` *`Algorithm As Constant`*`)`

Parameter See Appendix A for Settling Algorithm and parameter name descriptions.

Description This command sets the settling parameters for the `ATS2.Dio.RateRdg` command.

See Also `ATS2.Dio.RateRdg, ATS2.Dio.RateReady, ATS2.Dio.RateTrig`

Example See example for `ATS2.Dio.RateRdg`.

ATS2.Dio.RateTrig — Method

Syntax **`ATS2.Inst.`**

Description Causes a restart of the reading cycle and zeros the ready count for the `ATS2.Dio.RateRdg` command. The reading in progress is aborted.

See Also `ATS2.Dio.RateRdg, ATS2.Dio.RateReady, ATS2.Dio.RateSettling`

Example See example for `ATS2.Dio.RateRdg`.

ATS2.Dio.RefRate

Property

Syntax `ATS2.Dio.RefRate(ByVal Unit As String)`

Data Type Double — Set Reference Sample Rate value.

Parameter

Name	Description
Unit	String that designates the desired unit. The following units are valid for this command: Hz

Description This command sets the Digital Input/Output Sample Rate reference.

See Also `ATS2.Inst.InScaleFreq, ATS2.Inst.OutRate, ATS2.Inst.RateRdg`

ATS2.Dio.VoltageRdg

Property

Syntax `ATS2.Dio.VoltageRdg(ByVal Unit As String)`

Data Type Double

Parameter

Name	Description
Unit	String that designates the desired unit. The following unit is valid for this command: Vpp

Description This command returns a settled reading for the Digital Input/Output Voltage meter and zeros the ready count.

See Also `ATS2.Dio.VoltageReady, ATS2.Dio.VoltageSettling, ATS2.Dio.VoltageTrig`

Example

```
Sub Main
  ATS2.Dio.InFormat = apbDioInGenMon
  ATS2.Dio.VoltageSettling(5.0, .001, "Vpp", 1, _
     0.0,  apbNone)
  ATS2.Dio.OutVoltage("Vpp") = 1.0
  ATS2.Dio.VoltageTrig
  Do Until ATS2.Dio.VoltageReady
     'perform other actions while
     'waiting for readings ...
  Loop
  rdgA = ATS2.Dio.VoltageRdg("Vpp")
```

```
    ATS.Prompt.Text = "Ch A = " & rdgA & " Vpp"
    ATS.Prompt.ShowWithContinue
    Stop
End Sub
```

ATS2.Dio.VoltageReady — Property

Syntax **ATS2.Dio.VoltageReady**

Data Type Integer

0	Reading not ready.
>0	Reading ready.

Description This command returns the Digital Input/Output Voltage meter settled reading ready count.

Because readings do not return until a reading is ready, this command may be used to avoid waiting for a reading. This command does NOT zero the ready count and so may be called any number of times. Only a call to the `ATS2.Dio.VoltageRdg` or `ATS2.Dio.VoltageTrig` commands will zero the ready count.

If the reading is found to be ready, a call to the `ATS2.Dio.VoltageRdg` command will be guaranteed to return quickly.

See Also `ATS2.Dio.VoltageRdg, ATS2.Dio.VoltageSettling, ATS2.Dio.VoltageTrig`

Example See example for `ATS2.Dio.VoltageRdg`.

ATS2.Dio.VoltageSettling — Method

Syntax **ATS2.Dio.VoltageSettling(**ByVal *Tolerance* As Double, ByVal *Floor* As Double, ByVal *FloorUnit* As String, ByVal *Points* As Integer, ByVal *Delay* As Double, ByVal *Algorithm As Constant*)

Parameter See Appendix A for Settling Algorithm and parameter name descriptions.

Description This command sets the settling parameters for the `ATS2.Dio.VoltageRdg` command.

See Also `ATS2.Dio.VoltageRdg, ATS2.Dio.VoltageReady, ATS2.Dio.VoltageTrig`

Example See example for `ATS2.Dio.VoltageRdg`.

ATS2.Dio.VoltageTrig — Method

Syntax **`ATS2.Inst.`**

Description Causes a restart of the reading cycle and zeros the ready count for the `ATS2.Dio.VoltageRdg` command. The reading in progress is aborted.

See Also `ATS2.Dio.VoltageRdg, ATS2.Dio.VoltageReady, ATS2.Dio.VoltageSettling`

Example See example for `ATS2.Dio.VoltageRdg`.

Chapter 25
Hardware

ATS2.Hardware.AdjustmentDate — Method

Syntax **`ATS2.Hardware.AdjustmentDate`**

Result String

Description This command returns the ASCII text string for the ATS-2 Adjustment Date.

Example

```
Sub Main
  Debug.Print "Serial Number " & _
     ATS2.Hardware.SerialNumber
  Debug.Print "Adjustment Date " & _
     ATS2.Hardware.AdjustmentDate
  Debug.Print "Board Serial Number " & _
     ATS2.Hardware.BoardSerialNumber
  Debug.Print "Manufacture Date " & _
     ATS2.Hardware.ManufactureDate
  If ATS2.Hardware.OptionInstalled(apbDCX127) Then _
     Debug.Print "DCX-127 Option Installed"
  If ATS2.Hardware.OptionInstalled(apbGPIB) Then _
     Debug.Print "GPIB Option Installed"
  If ATS2.Hardware.OptionInstalled(apbHighBandwidth)_
     Then Debug.Print "High Bandwidth Option _
     Installed"
  If ATS2.Hardware.OptionInstalled(apbHwSwitcher)_
     Then Debug.Print "Switcher Option Installed"
  If ATS2.Hardware.OptionInstalled(apbInputZ600) _
     Then Debug.Print "600 InputZ Option Installed"
  If ATS2.Hardware.OptionInstalled(apbIntervu) Then _
     Debug.Print "Interv Option Installed"
  If ATS2.Hardware.OptionInstalled(apbOutputZ150)_
     Then Debug.Print "150 OutputZ Option Installed"
```

```
    If ATS2.Hardware.OptionInstalled(apbOutputZ200) _
       Then Debug.Print "200 OutputZ Option Installed"
    If ATS2.Hardware.OptionInstalled(apbOutputZ600) _
       Then Debug.Print "600 OutputZ Option Installed"
End Sub
```

Output

```
Serial Number 100001
Adjustment Date 1/28/2002
Board Serial Number -62-1-0
Manufacture Date 1/24/2002
DCX-127 Option Installed
High Bandwidth Option Installed
Switcher Option Installed
Interv Option Installed
150 OutputZ Option Installed
```

ATS2.Hardware.BoardSerialNumber — Method

Syntax `ATS2.Hardware.BoardSerialNumber`

Result String

Description This command returns the ASCII text string for the ATS-2 Board Serial Number.

Example See example for `ATS2.Hardware.AdjustmentDate`.

ATS2.Hardware.ManufactureDate — Method

Syntax `ATS2.Hardware.ManufactureDate`

Result String

Description This command returns the ASCII text string for the ATS-2 ManufactureDate.

Example See example for `ATS2.Hardware.AdjustmentDate`.

ATS2.Hardware.OptionInstalled — Method

Syntax `ATS2.Hardware.OptionInstalled(ByVal Option As Constant)`

Data Type Boolean

True	Option Installed.
False	Option NOT Installed.

Parameter

Name	Description
Option	apbDCX127 = DCX-127 apbGPIB = GPIB Interface apbHighBandwidth = High Bandwidth apbHwSwitcher = Switcher apbIntervu = apbInputZ600 = 600 Ohm Input Impedance apbOutputZ150 = 150 Ohm Output Impedance apbOutputZ200 = 200 Ohm Output Impedance apbOutputZ600 = 600 Ohm Output Impedance

Description This command returns the status of the specified hardware option.

Example See example for `ATS2.Hardware.AdjustmentDate`.

ATS2.Hardware.SerialNumber — Method

Syntax `ATS2.Hardware.SerialNumber`

Result String

Description This command returns the ASCII text string for the ATS-2 Serial Number.

Example See example for `ATS2.Hardware.AdjustmentDate`.

Chapter 26

Audio Analyzer

ATS2.Inst.Analyzer.DCCoupled — Property

Syntax `ATS2.Inst.Analyzer.DCCoupled(ByVal Channel As Constant)`

Data Type Boolean

True	DC Coupled
False	Not DC Coupled

Parameter

Name	Description
Channel	apbChA = Select channel A apbChB = Select channel B

Description This command enables ATS to DC couple the input to the Audio Analyzer. The level meter can then be used to measure DC.

Example See example for `ATS2.Inst.Analyzer.FreqRdg`.

ATS2.Inst.Analyzer.FreqRdg — Property

Syntax `ATS2.Inst.Analyzer.FreqRdg(ByVal Channel As Constant, ByVal Unit As String)`

Data Type Double

Parameter

Name	Description
Channel	apbChA = Select channel A apbChB = Select channel B
Unit	The following units are available: Hz, F/R, dHz, %Hz, cent, octs, decs, d%, dPPM.

Description This command returns a settled reading for the Audio Analyzer Frequency meter and zeros the ready count.

See Also ATS2.Inst.Analyzer.FreqReady,
ATS2.Inst.Analyzer.FreqSettling,
ATS2.Inst.Analyzer.FreqTrig

Example

```
Sub Main
  ATS.Application.NewTest
  ATS2.AGen.Output = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS.Application.PanelOpen(apbAnalyzer, apbLarge)
  With ATS2.Inst.Analyzer
     .InputFormat = apbInstInAnalog
     .DCCoupled(apbChA) = False
     .RangeAuto(apbChA) = False
     .Range(apbChA, "FFS") = 1.0
     .LevelSettling(apbChA, 1.0, 0.000001, _
        "V", 3, 0.03, apbExponential)
     .FreqSettling(apbChA, 0.5, 0.01, _
        "Hz", 3, 0.03, apbExponential)
     .LevelTrig(apbChA)
     .FreqTrig(apbChA)
     Do
        Loop Until .LevelReady(apbChA) And _
           .FreqReady(apbChA)
     var1 = .LevelRdg(apbChA, "V")
     var2 = .FreqRdg(apbChA, "Hz")
  End With
  Text1$= "Channel A Level " & _
     Str$(Format(var1, "##.000")) & "V"
  Text2$= "Channel A Frequency " & _
     Str$(Format(var2, "##.000")) & "Hz"
  ATS.Prompt.Text = Text1$ & Chr(13) & Text2$
  ATS.Prompt.ShowWithContinue
  Stop
End Sub
```

ATS2.Inst.Analyzer.FreqReady Property

Syntax **ATS2.Inst.Analyzer.FreqReady(**ByVal *Channel* As Constant**)**

Data Type Integer

0	Reading not ready.
>0	Reading ready.

Parameter

Name	Description
Channel	apbChA = Select channel A apbChB = Select channel B

Description This command returns the Audio Analyzer Frequency meter settled reading ready count.

Because readings do not return until a reading is ready, this command may be used to avoid waiting for a reading. This command does NOT zero the ready count and so may be called any number of times. Only a call to the `ATS2.Inst.Analyzer.FreqRdg` or `ATS2.Inst.Analyzer.FreqTrig` commands will zero the ready count.

If the reading is found to be ready, a call to the `ATS2.Inst.Analyzer.FreqRdg` command will be guaranteed to return quickly.

See Also `ATS2.Inst.Analyzer.FreqRdg`, `ATS2.Inst.Analyzer.FreqSettling`, `ATS2.Inst.Analyzer.FreqTrig`

Example See example for `ATS2.Inst.Analyzer.FreqRdg`.

ATS2.Inst.Analyzer.FreqSettling — Method

Syntax **`ATS2.Inst.Analyzer.FreqSettling(`**`ByVal` *`Channel`* `As Constant, ByVal` *`Tolerance`* `As Double, ByVal` *`Floor`* `As Double, ByVal` *`FloorUnit`* `As String, ByVal` *`Points`* `As Integer, ByVal` *`Delay`* `As Double, ByVal` *`Algorithm As Constant`*`)`

Parameter See Appendix A for Settling Algorithm and parameter name descriptions.

Description This command sets the settling parameters for the `ATS2.Inst.Analyzer.FreqRdg` command.

See Also `ATS2.Inst.Analyzer.FreqRdg`, `ATS2.Inst.Analyzer.FreqReady`, `ATS2.Inst.Analyzer.FreqTrig`

Example See example for `ATS2.Inst.Analyzer.FreqRdg`.

ATS2.Inst.Analyzer.FreqTrig — Method

Syntax **`ATS2.Inst.Analyzer.FreqTrig(`**`ByVal` *`Channel`* `As Constant`**`)`**

Parameter

Name	Description
`Channel`	apbChA = Select channel A apbChB = Select channel B

Description Causes a restart of the reading cycle and zeros the ready count for the `ATS2.Inst.Analyzer.FreqRdg` command. The reading in progress is aborted.

See Also `ATS2.Inst.Analyzer.FreqRdg`, `ATS2.Inst.Analyzer.FreqReady`, `ATS2.Inst.Analyzer.FreqSettling`

Example See example for `ATS2.Inst.Analyzer.FreqRdg`.

ATS2.Inst.Analyzer.FuncBPBRFreq — Property

Syntax **`ATS2.Inst.Analyzer.FuncBPBRFreq(`**`ByVal` *`Unit`* `As String`**`)`**

Data Type Double

Parameter

Name	Description
`Unit`	The following units are available: Hz, F/R, dHz, %Hz, cent, octs, decs, d%, dPPM.

Description This command sets the Audio Analyzer BandPass/BandReject filter to the frequency value passed.

The Bandpass filter affects only the main (Reading) meter, not the Level or Frequency reading. It is a highly-selective filter of about 1/13 octave bandwidth (Q=19, 3 dB bandwidth about 5.2% of center frequency). The bandpass filter is tunable across the audio spectrum from 0.04% to 42% of the sample rate (20 Hz to 20 kHz at a 48 kHz sample rate). It is used in Bandpass and Crosstalk functions.

The Bandreject (notch) function of the filter is used in the two THD+N functions. It is tunable from 0.04% to 42% of the sample rate (20 Hz to 20 kHz at a 48 kHz rate).

See Also `ATS2.Inst.Analyzer.FuncBPBRTuning`, `ATS2.Inst.Analyzer.FuncMode`

Example

```
Sub Main
  ATS.Application.NewTest
  ATS2.AGen.Output = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS.Application.PanelOpen(apbAnalyzer, apbLarge)
  With ATS2.Inst.Analyzer
     .InputFormat = apbInstInAnalog
     .FuncMode = apbAnlrBandpass
     .RdgRate = apbAnlr32PerSec
     .FuncDetector = apbAnlrRMS
     .FuncBPBRTuning = apbAnlrFixed
     .FuncBPBRFreq("Hz") = 999.99
     .FuncSettling(apbChA, 3.0, 1.0e-8, _
         "V", 3, 0.1, apbExponential)
     .FuncTrig(apbChA)
     Do
     Loop Until .FuncReady(apbChA)
     var1 =   .FuncRdg(apbChA, "V")
  End With
  Text$= "Bandpass Amplitude " & Str$(Format(var1, _
     "##.000")) & "V"
  ATS.Prompt.Text = Text$ & Chr(13)
  ATS.Prompt.ShowWithContinue
  Stop
End Sub
```

ATS2.Inst.Analyzer.FuncBPBRTuning Property

Syntax `ATS2.Inst.Analyzer.FuncBPBRTuning`

Data Type Constant

apbAnlrCounterTuned

Counter Tuned: the frequency value measured by the ANALYZER Frequency counter is the filter steering source. This function would be selected when making THD+N or Crosstalk measurements from an external signal such as reproduction of a Compact Disc or digital audio tape or reception of a digital signal from a distant source.

apbAnlrSweepTrack

Sweep Track: the filter tracks the frequency of whichever generator is selected in the Source 1 or Source 2 fields of the Sweep panel.

apbAnlrAGenTrack

AGen Track: the digital bandpass-bandreject filter tracks the frequency of the Analog Generator, This mode is useful for testing A/D converters driven from ATS-2's analog output.

apbAnlrDGenTrack

DGen Track: the filter will automatically track the frequency of the Digital Generator. This mode would normally be used when sweeping digital input-digital output devices with stimulus coming from ATS-2's Digital Generator.

apbAnlrFixed

Fixed: the filter will be fixed at the frequency entered in the BP/BR Filter Freq field just below unless the filter is being deliberately varied as part of a sweep test. To sweep the filter frequency during a test, select BP/BR Filter Freq as the Source 1 or Source 2 parameter on the Sweep panel. Fixed tuning mode must be selected in order to use the BP/BR Filter Freq parameter as a Source value.

Description This command sets the Audio Analyzer Bandpass Bandreject filter Tuning source.

See Also `ATS2.Inst.Analyzer.FuncBPBRFreq`

Example See example for `ATS2.Inst.Analyzer.FuncBPBRFreq`.

ATS2.Inst.Analyzer.FuncDetector Property

Syntax **`ATS2.Inst.Analyzer.FuncDetector`**

Data Type Constant

`apbAnlrRMS`
: RMS: Level and Function meters use RMS detector.

`apbAnlrFastRMS`
: Fast RMS: Level and Function meters use Fast RMS detector.

`apbAnlrQpeak`
: Qpeak: Level meters use RMS detection and Function meters use Qpeak detector.

Description This command selects the Audio Analyzer Detector type for the Level and Function meters.

See Also `ATS2.Inst.Analyzer.RdgRate`, `ATS2.Inst.Analyzer.FuncMode`, `ATS2.Inst.Analyzer.FuncRange`, `ATS2.Inst.Analyzer.FuncRangeAuto`

Example

```
Sub Main
  ATS.Application.NewTest
  ATS2.AGen.OutputOn = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS.Application.PanelOpen(apbAnalyzer, apbLarge)
  With ATS2.Inst.Analyzer
     .InputFormat = apbInstInAnalog
     .FuncMode = apbAnlrTHDNRatio
     .FuncRangeAuto(apbChA) = True
'    .Range(apbChA, "dBFS") = 0.0
     .RdgRate = apbAnlrAuto
     .FuncDetector = apbAnlrRMS
     .FuncFilterHP = apbAnlrHP10
     .FuncFilterLP = apbAnlrLP20k
```

```
        .FuncFilter = apbAnlrNone
        .FuncSettling(apbChA, 3.0, 0.000010, _
            "%", 3, 0.1, apbExponential)
        Wait .5
        .FuncTrig(apbChA)
        Do
           Loop Until .FuncReady(apbChA)
        var = .FuncRdg(apbChA, "%")
    End With
    Text$= "THD+N = " & Str$(Format(var, "##.00000")) _
       & "%"
    ATS.Prompt.Text = Text$ & Chr(13)
    ATS.Prompt.ShowWithContinue
    Stop
End Sub
```

ATS2.Inst.Analyzer.FuncFilter — Property

Syntax **ATS2.Inst.Analyzer.FuncFilter**

Data Type Constant

The following list contains the selections relevant to the ATS2.Inst.Analyzer.FuncMode command Ampitude, THD+N Ampl, THD+N Ratio, and 2-Ch Ratio selections.

apbAnlrNone
: None

apbAnlrAWeight
: "A" Weighting

apbAnlrCCIR
: CCIR Weighting

apbAnlrFWeight
: F Weighting

apbAnlrCCITT
: CCITT Weighting

apbAnlrCMessage
C-Message Weighting

apbAnlrHarmonicWeight
Ho-2 Harmonic Weighting (THD Only)

apbAnlrUserWeight
User Weighting Filter

The following list contains the selections relevant to the `ATS2.Inst.Analyzer.FuncMode` command Bandpass selection.

apbAnlrNarrow
Narrow

apbAnlrNarrowX2
Narrow, Freq x2

apbAnlrNarrowX3
Narrow, Freq x3

apbAnlrNarrowX4
Narrow, Freq x4

apbAnlrNarrowX5
Narrow, Freq x5

The following list contains the selections relevant to the `ATS2.Inst.Analyzer.FuncMode` command Crosstalk selection.

apbAnlrNarrow
Narrow

Description This command selects the Audio Analyzer Weighting Filter.

See Also `ATS2.Inst.Analyzer.FuncFilterHP`, `ATS2.Inst.Analyzer.FuncFilterLP`

Example See example for `ATS2.Inst.Analyzer.FuncDetector`.

ATS2.Inst.Analyzer.FuncFilterFilename Get Only Property

Syntax `c`

Data Type Integer Column number.

Parameter

Name	Description
Number	Sweep Data selection number (1-6)

Description This command sets the column number used for the Lower Limit of a Sweep Data.

See Also `ATS.Sweep.Data.AutoDiv, ATS.Sweep.Data.LogLin`

Example See example for `ATS.Sweep.Append`.

ATS2.Inst.Analyzer.FuncFilterHP Property

Syntax `ATS2.Inst.Analyzer.FuncFilterHP`

Data Type Constant

apbAnlrHP10
<10 Hz

apbAnlrHP22
22 Hz

apbAnlrHP100
100 Hz

apbAnlrHP400
400 Hz

apbAnlrHPUser
High Pass user defined filter

Description This command selects the Audio Analyzer High Pass filter used with the function meters.

See Also `ATS2.Inst.Analyzer.FuncFilterLP`

Example See example for `ATS2.Inst.Analyzer.FuncDetector`.

ATS2.Inst.Analyzer.FuncFilterLP Property

Syntax **ATS2.Inst.Analyzer.FuncFilterLP**

Data Type Integer

apbAnlrLPFS2
Fs/2

apbAnlrLP20K
20 kHz LP

apbAnlrLP15K
15 kHz LP

apbAnlrLPUser
Low Pass user defined filter

Description This command selects the Audio Analyzer Low Pass filter used with the function meters.

See Also ATS2.Inst.Analyzer.FuncFilterHP

Example See example for ATS2.Inst.Analyzer.FuncDetector.

ATS2.Inst.Analyzer.FuncFilterUserDefined Method

Syntax **ATS2.Inst.Analyzer.FuncFilterHP(**ByVal *FilterType* as Constant, ByVal *FileName* as String**)**

Parameter

Name	Description
FilterType	apbAnlrUserFilterHP = Specifies that the file defined by the second parameter (*FileName)* will be attached as a high pass filter. The high pass used defined filter can be selected by using the ATS2.Inst.Analyzer.FuncFilterHP command. The file must be an ATS high-pass filter file (.afh) for this selection. apbAnlrUserFilterLP = Specifies that the file defined by the second parameter (*FileName)* will be attached as a low pass filter. The high pass used defined filter can be selected by using the

		`ATS2.Inst.Analyzer.FuncFilterLP` command. The file must be an ATS low-pass filter file (.afl) for this selection. apbAnlrUserFilterWeight = Specifies that the file defined by the second parameter (*FileName)* will be attached as a weighting filter. The high pass used defined filter can be selected by using the `ATS2.Inst.Analyzer.FuncFilter` command. The file must be an ATS weighting filter file (.afw) for this selection.
	FileName	Long Path and File Names permitted up to 128 characters. Enter "None" for the file name to remove the User-Defined Filter.

Result Boolean

True	File attachment successful.
False	File attachment failed.

Description This command attaches a User-Defined Filter for use with the Audio Analyzer. When a filter is attached, the design is tested to determine that there are not more than 2 second-order sections used to create the filter and that the filter is stable. If either of these conditions is not met then this command returns False.

See Also `ATS2.Inst.Analyzer.FuncFilterHP`, `ATS2.Inst.Analyzer.FuncFilterLP`, `ATS2.Inst.Analyzer.FuncFilter`

Example

```
Sub Main
  ATS2.Inst.Analyzer.FuncFilterUserDefined _
  (apbAnlrUserFilterHP, "My_HP-1.afh")
End Sub
```

ATS2.Inst.Analyzer.FuncMode

Property

Syntax **`ATS2.Inst.Analyzer.FuncMode`**

Data Type Constant

apbAnlrAmplitude

Amplitude: Amplitude mode measurements can differ from the Level meter measurements due to two factors:

Amplitude mode measurements are affected by the high-pass (`ATS2.Inst.Analyzer.FilterHP`), low-pass (`ATS2.Inst.Analyzer.FilterLP`), and weighting filter (`ATS2.Inst.Analyzer.FuncFilter`) commands, while Level meter readings are unfiltered. Amplitude measurements may be made with the quasi-peak or one of the RMS detectors, while the Level meters always use the same type of RMS detector selected with the `ATS2.Inst.Analyzer.FuncDetector` command.

apbAnlrTwoChRatio

2-Channel Ratio: 2-Ch Ratio mode displays in the Function Reading meter display the amplitude ratio between the Function Reading meter channel and the alternate channel. Both Level meters continue to display the absolute level on each channel. 2-Ch Ratio function is useful while adjusting stereo channel amplitudes to match or for measuring gain or loss when the analyzer inputs are connected at the input and output of a device.

apbAnlrCrossTalk

Crosstalk: Crosstalk mode is identical to the 2-Ch Ratio mode except that the tunable bandpass filter is also engaged in the main (Function Reading) meter before the measurement. Crosstalk mode will thus provide more accurate measurements of low-amplitude signals in the presence of noise, since most wide-band noise will be rejected by the filter. The filter must be tuned to the frequency of the signal on the driven channel.

apbAnlrTHDNRatio

THD+N Ratio: The THD+N mode uses a bandreject (notch) filter to remove the fundamental sinewave signal so that the detector may measure the remaining harmonic distortion products and noise. The THD+N Ratio mode expresses the

distortion product and noise amplitudes relative to the amplitude of the unfiltered signal measured by the Level meter. Units of % and dB (below fundamental) are commonly used in THD+N Ratio function. THD+N Ratio is used much more commonly than THD+N Amplitude, but in an amplitude sweep THD+N Ratio appears to show increasing distortion and noise with decreasing signal amplitude because the distortion and noise is stated as a ratio to the decreasing signal. THD+N Amplitude may be more useful for amplitude sweeps. The bandreject filter center frequency may be fixed or may track one of several other parameters.

apbAnlrTHDNABS

THD+N Ampl: The THD+N Amplitude mode uses a bandreject (notch) filter to remove the fundamental sinewave signal so that the detector may measure the remaining harmonic distortion products and noise. The THD+N Ampl (amplitude) mode expresses amplitude of the remaining distortion products and noise in absolute units (FFS, %FS, dBFS, bits with digital signals; Volts, dBV, dBu, etc. with analog signals), independent of the amplitude of the fundamental signal. THD+N Ampl mode is particularly useful when performing amplitude sweeps of audio devices, since it helps make clear that the noise component is (typically) a constant amplitude unrelated to the signal amplitude. THD+N Ratio in an amplitude sweep obscures this fact, since the measured distortion and noise appears to increase with decreasing signal amplitude because it is being stated as a ratio to the decreasing signal.

The bandreject filter center frequency may be fixed or may track one of several other parameters.

apbAnlrBandpass

Bandpass: Bandpass mode is a selective voltmeter. It includes a narrow bandpass filter of about 1/13 octave (Q=19, 3 dB bandwidth about 5.2% of center frequency). The bandpass filter center frequency may be fixed or may track one of several other parameters. The filter may be

tuned to the steering source fundamental frequency or to the 2nd, 3rd, 4th, or 5th harmonic of the tuning source. This harmonic tracking ability permits swept measurements of individual harmonic distortion, limited to a maximum value of 42% of the sample rate:

apbAnlrSMPTE

SMPTE/DIN: The SMPTE/DIN mode is designed to function with two-tone intermodulation distortion test signals complying with the SMPTE or DIN standard, or similar to these. These signals normally consist of a low-frequency tone between 40 Hz and 500 Hz combined with a high-frequency tone above 2 kHz. Typical SMPTE tone combinations are 60 Hz and 7 kHz, while 250 Hz and 8 kHz are often used with the DIN standard. The amplitude ratio of the LF tone to the HF tone is commonly 4:1 but the tones are sometimes at equal amplitudes. The analyzer function measures the amplitude of the sidebands near the high-frequency tone and expresses their amplitude as a ratio to the HF tone amplitude.

apbAnlrPhase

Phase: The Phase mode measures the phase of the B channel signal relative to the A channel signal (B-A), expressing the result in degrees. This corresponds to the phase measurement technique of the hardware analog analyzer, and to the Sine Variable Phase waveform of both the analog and digital generators. The Channel B display field is removed when the Phase function is selected.

Description This command selects the analysis mode of the Audio Analyzer Function meters.

Example See example for `ATS2.Inst.Analyzer.FuncDetector`.

ATS2.Inst.Analyzer.FuncPhaseMode Property

Syntax **`ATS2.Inst.Analyzer.FuncPhaseMode`**

Data Type Constant

apbAnlrPhaseAuto
Auto

apbAnlrPhase180
-180 +180 deg

apbAnlrPhase360
0 +360 deg

apbAnlrPhase270
-90 +270 deg

Description This function sets the Audio Analyzer Function meter Phase measurement range.

ATS2.Inst.Analyzer.FuncRange Property

Syntax `ATS2.Inst.Analyzer.FuncRange(ByVal` *`Channel`* `As Constant, ByVal` *`Unit`* `As String)`

Data Type Double

The following values are the range boundaries for the dB unit: 0.000, -6.021, -12.041, -18.062, -24.82, -30.103, -36.124, -42.144, -48.165, -54.185, -60.206, -66.227, -72.247, -78.268, -84.288, -90.309

If an arbitrary value between the range boundaries is entered the next higher range will be selected.

Parameter

Name	Description
Channel	apbChA = Select channel A apbChB = Select channel B
Unit	The following units are available: X/Y, dB

Description This command sets the Audio Analyzer Function meter Range.

See Also `ATS2.Inst.Analyzer.RdgRate`, `ATS2.Inst.Analyzer.FuncMode`, `ATS2.Inst.Analyzer.FuncRangeAuto`

Example See example for `ATS2.Inst.Analyzer.FuncDetector`.

ATS2.Inst.Analyzer.FuncRangeAuto Property

Syntax `ATS2.Inst.Analyzer.FuncRangeAuto`

Data Type Boolean

True	Auto range.
False	Fixed range.

Description This command sets the Audio Analyzer Function meter to Auto or Fixed Range.

See Also `ATS2.Inst.Analyzer.RdgRate`, `ATS2.Inst.Analyzer.FuncMode`, `ATS2.Inst.Analyzer.FuncRange`

Example See example for `ATS2.Inst.Analyzer.FuncDetector`.

ATS2.Inst.Analyzer.FuncRdg Property

Syntax `ATS2.Inst.Analyzer.FuncRdg(ByVal Channel As Constant, ByVal Unit As String)`

Data Type Double

Parameter

Name	Description
Channel	apbChA = Select channel A apbChB = Select channel B
Unit	String that designates the desired unit. The following units are valid for the "Digital" selection of the `ATS2.Inst.Analyzer.InputFormat` command for the Amplitude, THD+N Ampl, and Bandpass Function meter Modes: FFS, %FS, dBFS, Bits, V, Vp, Vpp, dBu, dBV, dBr A, dBr B. The following units are valid for the "Analog" selection of the `ATS2.Inst.Analyzer.InputFormat` command for the Amplitude, THD+N Ampl, and Bandpass Function meter Modes: V, dBu, dBV, dBr A, dBr B, dBg A, dBg B, W.

The following units (%, dB, PPM, X/Y) are available for the following Function meter Modes: 2-Ch Ratio, Crosstalk, THD+N Ratio, SMPTE IMD.

The (deg) units is available for the Function meter Phase Mode.

Description This command returns a settled reading from the Audio Analyzer Function meter and zeros the ready count.

See Also `ATS2.Inst.Analyzer.FuncMode`, `ATS2.Inst.Analyzer.FuncReady`, `ATS2.Inst.Analyzer.FuncSettling`, `ATS2.Inst.Analyzer.FuncTrig`

Example See example for `ATS2.Inst.Analyzer.FuncDetector`.

ATS2.Inst.Analyzer.FuncReady Property

Syntax **`ATS2.Inst.Analyzer.FuncReady(`**`ByVal` *`Channel`* `As Constant`**`)`**

Data Type Integer

0	Reading not ready.
>0	Reading ready.

Parameter

Name	Description
Channel	apbChA = Select channel A apbChB = Select channel B

Description This command returns the Audio Analyzer Function meter settled reading ready count.

Because readings do not return until a reading is ready, this command may be used to avoid waiting for a reading. This command does NOT zero the ready count and so may be called any number of times. Only a call to the `ATS2.Inst.Analyzer.FuncRdg` or

`ATS2.Inst.Analyzer.FuncTrig` commands will zero the ready count.

If the reading is found to be ready, a call to the `ATS2.Inst.Analyzer.FuncRdg` command will be guaranteed to return quickly.

See Also `ATS2.Inst.Analyzer.FuncRdg`, `ATS2.Inst.Analyzer.FuncSettling`, `ATS2.Inst.Analyzer.FuncTrig`

Example See example for `ATS2.Inst.Analyzer.FuncDetector`.

ATS2.Inst.Analyzer.FuncSettling — Method

Syntax **`ATS2.Inst.Analyzer.FuncSettling(`**`ByVal` *`Channel`* `As Constant, ByVal` *`Tolerance`* `As Double, ByVal` *`Floor`* `As Double, ByVal` *`FloorUnit`* `As String, ByVal` *`Points`* `As Integer, ByVal` *`Delay`* `As Double, ByVal` *`Algorithm As Constant)`*

Parameter See Appendix A for Settling Algorithm and parameter name descriptions.

Description This command sets the settling parameters for the `ATS2.Inst.Analyzer.FuncRdg` command.

See Also `ATS2.Inst.Analyzer.FuncRdg`, `ATS2.Inst.Analyzer.FuncReady`, `ATS2.Inst.Analyzer.FuncTrig`

Example See example for `ATS2.Inst.Analyzer.FuncDetector`.

ATS2.Inst.Analyzer.FuncTrig — Method

Syntax **`ATS2.Inst.Analyzer.FuncTrig`**

Description Causes a restart of the reading cycle and zeros the ready count for the `ATS2.Inst.Analyzer.FuncRdg` command. The reading in progress is aborted.

See Also `ATS2.Inst.Analyzer.FuncRdg`, `ATS2.Inst.Analyzer.FuncReady`, `ATS2.Inst.Analyzer.FuncSettling`

Example See example for `ATS2.Inst.Analyzer.FuncDetector`.

ATS2.Inst.Analyzer.InputFormat

Property

Syntax **`ATS2.Inst.Analyzer.InputFormat`**

Data Type Constant

`apbInstInDigital`
Digital

`apbInstInAnalog`
Analog

Description This command sets the Audio Analyzer Input Format.

Example See example for `ATS2.Inst.Analyzer.FuncDetector`.

ATS2.Inst.Analyzer.LevelRdg

Property

Syntax **`ATS2.Inst.Analyzer.LevelRdg(`**`ByVal` *`Channel`* `As Constant, ByVal` *`Unit`* `As String`**`)`**

Data Type Double

Description This command returns a settled reading for the Audio Analyzer Level meter and zeros the ready count.

Parameter

Name	Description
`Channel`	apbChA = Select channel A apbChB = Select channel B
`Unit`	String that designates the desired unit. The following units are valid for the "Digital" selection of the `ATS2.Inst.Analyzer.InputFormat` command: FFS, %FS, dBFS, Bits, V, Vp, Vpp, dBu, dBV,

dBr 1, dBr 2.

The following units are valid for the "Analog" selection of the `ATS2.Inst.Analyzer.InputFormat` command: V, dBu, dBV, dBr A, dBr B, dBg A, dBg B, and W.

See Also `ATS2.Inst.Analyzer.LevelReady`, `ATS2.Inst.Analyzer.LevelSettling`, `ATS2.Inst.Analyzer.LevelTrig`

Example See example for `ATS2.Inst.Analyzer.FreqRdg`.

ATS2.Inst.Analyzer.LevelReady — Property

Syntax **`ATS2.Inst.Analyzer.LevelReady(`**`ByVal` *`Channel`* `As Constant`**`)`**

Data Type Integer

0	Reading not ready.
>0	Reading ready.

Parameter

Name	Description
Channel	apbChA = Select channel A apbChB = Select channel B

Description This command returns the Audio Analyzer Level Monitor meter settled reading ready count.

Because readings do not return until a reading is ready, this command may be used to avoid waiting for a reading. This command does NOT zero the ready count and so may be called any number of times. Only a call to the `ATS2.Inst.Analyzer.LevelRdg` or `ATS2.Inst.Analyzer.LevelTrig` commands will zero the ready count.

If the reading is found to be ready, a call to the `ATS2.Inst.Analyzer.LevelRdg` command will be guaranteed to return quickly.

See Also `ATS2.Inst.Analyzer.LevelRdg`, `ATS2.Inst.Analyzer.LevelSettling`, `ATS2.Inst.Analyzer.LevelTrig`

Example See example for `ATS2.Inst.Analyzer.FreqRdg`.

ATS2.Inst.Analyzer.LevelSettling — Method

Syntax **`ATS2.Inst.Analyzer.LevelSettling(`**`ByVal` *`Channel`* `As Constant, ByVal` *`Tolerance`* `As Double, ByVal` *`Floor`* `As Double, ByVal` *`FloorUnit`* `As String, ByVal` *`Points`* `As Integer, ByVal` *`Delay`* `As Double, ByVal` *`Algorithm As Constant`***`)`**

Parameter See Appendix A for Settling Algorithm and parameter name descriptions.

Description This command sets the settling parameters for the `ATS2.Inst.Analyzer.LevelRdg` command.

See Also `ATS2.Inst.Analyzer.LevelRdg`, `ATS2.Inst.Analyzer.LevelReady`, `ATS2.Inst.Analyzer.LevelTrig`

Example See example for `ATS2.Inst.Analyzer.FreqRdg`.

ATS2.Inst.Analyzer.LevelTrig — Method

Syntax **`ATS2.Inst.Analyzer.LevelTrig(`**`ByVal` *`Channel`* `As Constant`**`)`**

Parameter

Name	Description
`Channel`	apbChA = Select channel A apbChB = Select channel B

Description Causes a restart of the reading cycle and zeros the ready count for the `ATS2.Inst.Analyzer.LevelRdg` command. The reading in progress is aborted.

See Also `ATS2.Inst.Analyzer.LevelRdg`, `ATS2.Inst.Analyzer.LevelSettling`, `ATS2.Inst.Analyzer.LevelTrig`

Example See example for `ATS2.Inst.Analyzer.FreqRdg`.

ATS2.Inst.Analyzer.Range Property

Syntax **`ATS2.Inst.Analyzer.Range(`**`ByVal` *`Channel`* `As Constant, ByVal` *`Unit`* `As String`**`)`**

Data Type Double

The following values are the range boundaries for the dB unit: 0.000, -6.021, -12.041, -18.062, -24.82, -30.103, -36.124, -42.144, -48.165, -54.185, -60.206, -66.227, -72.247, -78.268, -84.288, -90.309

If an arbitrary value between the range boundaries is entered the next higher range will be selected.

Parameter

Name	Description
`Channel`	apbChA = Select channel A apbChB = Select channel B
`Unit`	The following units are available: FFS, %FS, dBFS, dBr A or dBr B for channel B.

Description This command sets the Audio Analyzer input Range and returns the nominal full scale of the range in use.

See Also `ATS2.Inst.Analyzer.RangeAuto`

Example See example for `ATS2.Inst.Analyzer.FreqRdg`.

ATS2.Inst.Analyzer.RangeAuto Property

Syntax **`ATS2.Inst.Analyzer.RangeAuto`**

Data Type Boolean

`True`	Auto range.
`False`	Fixed range.

Description This command sets the Audio Analyzer Function meter to Auto or Fixed Range. Care must be taken when using Fixed range that the input signal does not exceed the selected range.

See Also `ATS2.Inst.Analyzer.Range`

Example See example for `ATS2.Inst.Analyzer.FreqRdg`.

ATS2.Inst.Analyzer.RdgRate Property

Syntax **`ATS2.Inst.Analyzer.RdgRate`**

Data Type Constant

`apbAnlrAuto`
: Auto: this selection manages selection of the reading rate as a function of the frequency being measured and the instrument function so as to provide rapid testing speeds along with sufficient integration for accuracy at the present test frequency.

`apbAnlr4PerSec`
: 4/Sec

`apbAnlr8PerSec`
: 8/Sec

`apbAnlr16PerSec`
: 16/Sec

`apbAnlr32PerSec`
: 32/Sec

`apbAnlr64PerSec`
: 64/Sec

`apbAnlr128PerSec`
: 128/Sec

`apbAnlr256PerSec`
: 256/sec

Description This command sets the Audio Analyzer Reading update Rate (integration period) for all of the Audio Analyzer meters.

See Also `ATS2.Inst.Analyzer.FuncDetector`, `ATS2.Inst.Analyzer.FuncMode`

Example See example for `ATS2.Inst.Analyzer.FuncDetector`.

User Notes

Chapter 27

Multitone Audio Analyzer

ATS2.Inst.FastTest.FreqRes — Property

Syntax `ATS2.Inst.FastTest.FreqRes(ByVal Unit As String)`

Data Type Double — Valid amplitude settings are from +/- 0.0 to 13.0 %.

Parameter

Name	Description
Unit	String that designates the desired unit. The following unit is valid for this command: %

Description

This command sets the Multitone Audio Analyzer Frequency Resolution.

The Frequency Resolution field is a numeric entry field with % units. The user may enter values up to 13% which are used in Response and Distortion Measurement functions.

In Response function, the amplitudes of all FFT bins within plus and minus the Frequency Resolution value of each sweep table value are combined in RSS (root-sum-square) fashion and furnished to the computer as the integrated amplitude of the bins within that range. The purpose of this function is to provide accurate frequency response measurements of devices with wow and flutter. Wow and flutter spreads the energy from a single tone across a narrow spectral band.

In Distortion function, the amplitudes of all FFT bins within plus and minus the Frequency Resolution value of each sweep table value are excluded from the RSS computation of energy falling between tones. Distortion function defines all signals other than the fundamental tones as distortion and noise. Entering a non-zero value of Frequency Resolution causes flutter sidebands to not be included in the distortion measurement.

Example See example for `ATS2.Inst.FastTest.TransformLength`.

ATS2.Inst.FastTest.InputFormat

Property

Syntax **`ATS2.Inst.FastTest.InputFormat`**

Data Type Integer

`apbInstInDigital`
Digital

`apbInstInAnalog`
Analog

Description This command sets the Multitone Audio Analyzer Input Format.

Example See example for `ATS2.Inst.FastTest.TransformLength`.

ATS2.Inst.FastTest.Mode

Property

Syntax **`ATS2.Inst.FastTest.Mode`**

Data Type Constant

`apbFastTestSpectrum`
Spectrum: Provides a normal FFT spectrum display with no processing except for peak picking. The Spectrum selection is typically used without a sweep table (.ADS file), and with a relative large number of Steps at Source 1 of the Sweep panel to provide good frequency resolution. Typical Steps values are from 250 to 500. If the transform length results in more FFT bins between the Start-Stop frequency span than are being plotted , peak-picking takes place. With peak-picking, the DSP searches all FFT bins between the previous plotted point and the point presently being plotted and sends the highest bin amplitude in that range as the amplitude of the new point to be sure that no signals are missed.

apbFastTestResponse

Response: is always used with a sweep table (.ADS file) listing the exact frequencies of the sinewaves in the multitone signal to be used for frequency response measurements. The DSP returns to the computer for plotting only the amplitudes of the FFT bins containing those exact frequencies, resulting in a frequency response graph.

If the value in the Frequency Resolution field is greater than zero, the DSP performs an RSS (root-sum-square) integration of all the bin amplitudes within plus or minus the Frequency Resolution value around each sweep table frequency and sends the integrated sum value to the computer to be plotted. This mode is intended for frequency response measurements on devices such as analog tape recorders which introduce frequency modulation (flutter) to signals. Flutter spreads each tone's energy across a small region of the spectrum. This reduces the amplitude of the fundamental tone, since the total energy in the fundamental and all sidebands remains constant during frequency modulation. The RSS summation combines this spread energy back into a single value, much as the human hearing system responds to signals with small amounts of FM.

apbFastTestDistortion

Distortion: excludes the amplitudes of the FFT bins known (from the generator waveform) to contain fundamental signals. All other bin amplitudes are summed (RSS) between each adjacent pair of frequencies requested from the DSP by the computer. It is not necessary to use a sweep table (.ADS file) listing the fundamental frequencies of the sinewaves in the multitone signal being used. Distortion and noise can thus be summed across spans determined by the Sweep panel Start, Stop, Log/Lin, and number of Steps, or the spans can be determined by a sweep table. If it is desired to sum the noise and distortion into critical bands, a sweep table can be used which defines the edges of the human hearing system critical bands. The resulting distortion and noise curve is normally compared to

the composite masking curve generated in Masking function.

If the value in the Frequency Resolution field is greater than zero, the DSP also excludes all the bin amplitudes within plus or minus the Frequency Resolution value around each sweep table frequency before sending the integrated sum value to the computer to be plotted. This mode is intended for distortion measurements on devices such as analog tape recorders which introduce frequency modulation (flutter) to signals. Flutter spreads each tone's energy across a small region of the spectrum. If these close-in sidebands which fall outside the bin containing the fundamental are not to be measured as distortion, they must be excluded, much as the human hearing system masks low amplitude signals nearby in frequency to a stronger signal.

apbFastTestNoise

Noise: this selection may be used with a sweep table (.ADS file) listing the fundamental frequencies of the multitone signal in use, but need not be. Noise mode depends on the FASTTEST Transform length being set to the value twice the length of the waveform file which generates the multitone signal. The analyzer frequency resolution is thus twice the resolution of the generated signal. The result is that every alternate analyzer FFT bin falls between bins at which the generated signal could contain fundamentals or bins into which harmonic or intermodulation distortion products due to the generated signal fundamental signals could fall (assuming that the device under test does not shift fundamental frequencies or produce frequency modulation). The amplitudes of these alternate empty bins consists of noise generated in the device under test, largely unaffected by fundamental signals or distortion. If the same sweep table is used in Noise mode that is used for response and distortion measurements, the resulting graph will be a spectrum analysis of noise in the presence of test signal. If a two-point sweep is made with Start at 20 Hz and Stop at

20 kHz, for example, the plotted value at 20 kHz represents the RSS integration of all empty bins across the audio band.

apbFastTestMasking

Masking: this selection generates a composite masking curve for the particular multitone signal in use. The shape of the curves is based on a model published by psychacoustician Brian Moore in the Proceedings of the AES 12th International Conference, June 1993, pp 22-23. The shape of the curves varies with frequency. The center frequency of each section of the composite masking curve is located at the fundamental frequencies present in the waveform file downloaded to the generator buffer. The reference amplitude at each frequency is determined by the measured amplitude at each fundamental frequency. The masking curve is normally used by saving it as a limit (.ADL) file, then comparing a Distortion function curve (usually with critical band spacing) to that limit curve.

apbFastTestCrosstalk

Crosstalk: depends upon the multitone test signal having one or more unique tone frequencies on each stereo channel, in addition to any number of tones which are common to both channels. Crosstalk function determines which generator frequencies are unique to a channel and measures the amplitude of the corresponding FFT frequency bin on the opposite channel. Unique frequencies are typically created in multitone signals at frequencies above 500 Hz, where the generator resolution is less limiting and where a bin occupied for crosstalk measurement purposes represents a small portion of the total bins for measurement of total integrated noise and distortion across that portion of the spectrum. In order to measure crosstalk in both directions (from A to B and from B to A), it is common to insert unique tones at pairs of nearby frequencies on each channel. For example, if monaural signals (tones on both channels) exist at about 500 Hz and 640 Hz, a crosstalk-measurement tone might be inserted at 560 Hz on Channel A and at 575 Hz on Channel B. Crosstalk is commonly used with a sweep table

corresponding to the approximate frequencies where the pairs of crosstalk frequencies have been inserted. At each frequency in the sweep table, the DSP will report the amplitude of the crosstalk-containing bin nearest the requested frequency. The FASTTEST Channel 1 curve will show measurements of crosstalk into that frequency from Channel 2, and vice-versa. If the stereo channels have been mistakenly reversed, the crosstalk measurements will show the levels of the tones in the channel on which they were transmitted. This makes it easy to automatically determine cases of swapped channels by setting an upper limit file for each channel.

Description This command sets the Multitone Audio Analyzer measurement mode. The `ATS2.Inst.FastTest.Mode` command controls the type of post-processing done to FFT results before they are sent to the computer for display and possible limits comparison.

Example See example for `ATS2.Inst.FastTest.TransformLength`.

ATS2.Inst.FastTest.PhaseDisplay — Property

Syntax **`ATS2.Inst.FastTest.PhaseDisplay`**

Data Type Constant

`apbFastTestIndependent`
: Independent

`apbFastTestInterChannel`
: Interchannel

Description This command sets the Multitone Audio Analyzer Phase Display mode selection.

The FFT of FASTTEST computes both magnitude and phase arrays as a function of frequency. The phase of coherent signals, such as multitone signals, may be plotted for either or both channels by selecting FASTTEST as the instrument and Ch 1 Phase or Ch 2 Phase as the parameter in the Data browser of the Sweep panel. A sweep table (.ADS file) listing the fundamental signals would be used

in this mode. When the channel 2 Phase Display is selected as Independent, the Ch 1 and Ch 2 Phase parameters each show the absolute phase of the fundamental tones.

It is also possible to plot the interchannel phase difference of stereo signals with FASTTEST. Selecting Interchannel causes the DSP to compute the phase difference between the Ch 1 and Ch 2 Phase signals at each sweep table value and report that computed value to the computer as the Ch 2 Phase parameter. The Ch 1 Phase parameter is unaffected by the Interchannel setting and plots absolute phase of the channel 1 signal.

Example See example for `ATS2.Inst.FastTest.TransformLength`.

ATS2.Inst.FastTest.Processing — Property

Syntax **`ATS2.Inst.FastTest.Processing`**

Data Type Constant

`apbFastTestSync`

Synchronous: Normal operation of FASTTEST involves acquisition of a multitone signal which was generated from a multitone waveform file by ATS's Digital Generator. The multitone waveform files furnished with ATS are created so as to be synchronous with one or another of the analyzer acquisition buffer lengths available in FASTTEST. Every sinewave in the generated signal goes through an exact integer number of cycles in the generator buffer and in the analyzer transform buffer. No windowing function is required and maximum theoretical FFT selectivity is achieved with full dynamic range available in bins adjacent to a bin containing a full-scale signal.

`apbFastTestFreqCorrect`

Freq Corrected: A key feature of FASTTEST is its ability to compare the tone frequencies in an acquired multitone waveform with the digital reference copy of the transmitted or pre-recorded waveform presently in the Digital Generator buffers. If this comparison shows that the tone frequencies

have been shifted up or down due to the signal originating from a device with a different clock frequency from the analyzer or due to analog tape player speed errors, FASTTEST corrects all the tone frequencies to the reference signal values. This re-creates the original synchronous relationship so that no window function is required before the FFT, and maximum theoretical FFT selectivity is obtained. The maximum frequency difference which can be corrected is +/-3%. FASTTEST is normally operated with Frequency Error Correction enabled when analyzing signals generated by another Audio Precision instrument or previously recorded and now being reproduced. This mode of operation is selected by the Freq Corrected selection in the Processing field.

apbFastTestWindowed

Windowed: If for some reason it is desired to measure remotely-generated or pre-recorded signals without use of the Frequency Error Correction feature, it will normally be necessary to use the Hann window function to obtain useful results. The Windowed selection of the Processing field enables the Hann window.

Description This command sets the Multitone Audio Analyzer processing.

Example See example for `ATS2.Inst.FastTest.TransformLength`.

ATS2.Inst.FastTest.Rdg

Property

Syntax **`ATS2.Inst.FastTest.Rdg(`**`ByVal` *`Channel`* `As Constant, ByVal` *`Unit`* `As String`**`)`**

Data Type Double

Parameter

Name	Description
`Channel`	apbChA = Select channel A apbChB = Select channel B
`Unit`	String that designates the desired unit. The following units are valid for this command: FFS, %FS, dBFS, Bits.

Description This command returns a unsettled reading for the Multitone Audio Analyzer Peak Monitor meter and zeros the ready count.

See Also `ATS2.Inst.FastTest.Ready, ATS2.Inst.FastTest.Trig`

Example

```
Sub Main
  ATS.File.OpenTest "FASTTSTC.ATS2"
  With ATS2.Inst.FastTest
     .Trig(apbChA)
     Do
     Loop Until .Ready(apbChA)
     AReading = .Rdg(apbChA, "dBFS")
  End With
  ATS.Prompt.Text = "ChA Peak Mon " _
     & Left(Str$(AReading),6) & "dBFS"
  ATS.Prompt.ShowWithContinue
  Stop
End Sub
```

ATS2.Inst.FastTest.Ready Property

Syntax **ATS2.Inst.FastTest.Ready(**ByVal *Channel* As Constant**)**

Data Type Integer

0	Reading not ready.
>0	Reading ready.

Parameter

Name	Description
Channel	apbChA = Select channel A apbChB = Select channel B

Description This command returns the Multitone Audio Analyzer Peak Monitor meter unsettled reading ready count.

Because readings do not return until a reading is ready, this command may be used to avoid waiting for a reading. This command does NOT zero the ready count and so may be called any

number of times. Only a call to the `ATS2.Inst.FastTest.Rdg` or `ATS2.Inst.FastTest.Trig` commands will zero the ready count.

If the reading is found to be ready, a call to the `ATS2.Inst.FastTest.Rdg` command will be guaranteed to return quickly.

See Also `ATS2.Inst.FastTest.Rdg, ATS2.Inst.FastTest.Trig`

Example See example for `ATS2.Inst.FastTest.Rdg`.

ATS2.Inst.FastTest.TransformLength Property

Syntax **`ATS2.Inst.FastTest.TransformLength`**

Data Type Constant

`apbFastTestAuto`
: Auto: the Auto selection will automatically set the acquisition buffer and transform length to be exactly twice the length of any generator waveform loaded into the Digital Generator buffer. This condition is necessary for the Noise function of FASTTEST to work.

`apbFastTest512`
: 512

`apbFastTest1k`
: 1024

`apbFastTest2k`
: 2048

`apbFastTest4k`
: 4096

`apbFastTest8k`
: 8192

`apbFastTest16k`
: 16384

apbFastTest32k
32768

Description This command sets the Multitone Audio Analyzer FFT Length.

The FFT Length field value of the FASTTEST program controls the record length used as input to the FFT process when either F9/Go or `ATS.Sweep.Start` is initiated to acquire and transform, or the F6 or `ATS.Sweep.Retransform` function key or Sweep Transform Data without Acquire menu command is used to re-transform any portion of a record previously acquired. Longer transform lengths produce greater frequency resolution in the resulting FFT, but require longer times to acquire and transform the signal.

Example

```
Sub Main
  ATS.File.OpenTest "FasttstB.ATS2"
  With ATS2.Inst.FastTest
     .InputFormat = apbInstInAnalog
     .Mode = apbFastTestSpectrum
     .FreqRes("%") = 1
     .TransformLength = apbFastTest16k
     .Processing = apbFastTestSync
     .TrigSource = apbFastTestDGen
     .TrigDelay("sec") = 0
     .PhaseDisplay = apbFastTestIndependent
     ATS.Sweep.Start
     ATS.Sweep.Source(1).Table("FASTTST.ATSS", 0)
     .Mode = apbFastTestResponse
     ATS.Sweep.Reprocess
     .Mode = apbFastTestDistortion
     ATS.Sweep.Reprocess
     .Mode = apbFastTestNoise
     ATS.Sweep.Reprocess
     .Mode = apbFastTestMasking
     ATS.Sweep.Reprocess
  End With
End Sub
```

ATS2.Inst.FastTest.Trig — Method

Syntax `ATS2.Inst.FastTest.Trig(ByVal Channel As Constant)`

Parameter

Name	Description
Channel	apbChA = Select channel A apbChB = Select channel B

Description Causes a restart of the reading cycle and zeros the ready count for the `ATS2.Inst.FastTest.Rdg` command. The reading in progress is aborted.

See Also `ATS2.Inst.FastTest.Rdg, ATS2.Inst.FastTest.Ready`

Example See example for `ATS2.Inst.FastTest.Rdg`.

ATS2.Inst.FastTest.TrigDelay — Property

Syntax `ATS2.Inst.FastTest.TrigDelay(ByVal Unit As String)`

Data Type Double — Values up to 1.365 seconds may be entered.

Parameter

Name	Description
Unit	String that designates the desired unit. The following unit is valid for this command: sec.

Description This command sets the Multitone Audio Analyzer trigger delay.

When testing audio transmission paths which include audio processors (compressors, limiters, etc.), it may be desirable to make measurements after the processors have stabilized following any change of level resulting between the multitone burst and the preceding program material. The Trigger Delay filed controls the interval between initial recognition of the incoming multitone signal and capture of the portion of signal which will finally be analyzed for response, distortion, noise, etc. Use of any non-zero Trigger Delay requires that the duration of multitone burst transmitted be increased by the same amount over normal minimum burst length.

Example See example for `ATS2.Inst.FastTest.TransformLength`.

Description This command sets the Multitone Audio Analyzer Triggering.

1. Using the tone frequencies represented in the Digital Generator buffer as a reference, FASTTEST looks at the received signal to see if the amplitude at each of a majority of those frequencies is within an acceptable relative amplitude range of the corresponding component of the reference signal. This criterion allows FASTTEST to ignore simple single-tone test signals, relatively-simple program material such as may be produced by a solo musical instrument, and conditions of silence.

2. Across all sections of the spectrum between tones in the reference signal, FASTTEST looks at the received signal to assure that its amplitude does not exceed a threshold of acceptability. This criterion allows FASTTEST to ignore complex voice and music program material which tends to have energy spread across much of the spectrum.

To permit user control of the triggering criteria, the allowable deviation from reference signal amplitude at generator tone frequencies (1 above) and the amount that energy at all other frequencies must be attenuated (2 above) are settable at three values. The Tight, Normal, and Loose selections each represents a different trade-off between the chance of false response on non-multitone signals versus the possibility of not triggering on legitimate multitone signals from a device with large amounts of noise and distortion and/or large deviations from flat frequency response. Select Tight for the minimum chance of false triggering This may be necessary when using very short generator waveform files (less than 2048 samples) since the consequent poorer frequency resolution makes it more difficult to discriminate between multitone signals and program material. Use Loose if FASTTEST will not otherwise trigger on highly distorted or noisy signals or signals passed through narrow-band or otherwise non-flat devices.

Example See example for `ATS2.Inst.FastTest.TransformLength`.

Chapter 28

FFT Spectrum Analyzer

ATS2.Inst.FFT.AcquireLength — Property

Syntax `ATS2.Inst.FFT.AcquireLength`

Data Type Constant

apbFFTTrack
: Track FFT

apbFFTAcq800
: 800

apbFFTAcq1500
: 1.5k

apbFFTAcq2500
: 2.5k

apbFFTAcq5k
: 5k

apbFFTAcq10k
: 10k

apbFFTAcq19k
: 19k

apbFFTAcq24k
: 24k

apbFFTAcq36k
: 36k

apbFFTAcq72k
: 72k

apbFFTAcq144k
144k

apbFFTAcq256k
256k

Description This command sets the FFT Spectrum Analyzer acquire buffer record length.

See Also `ATS2.Inst.FFT.TransformLength`

Example See example for `ATS2.Inst.FFT.Averages`.

ATS2.Inst.FFT.Averages — Property

Syntax **`ATS2.Inst.FFT.Averages`**

Data Type Constant

apbFftAvg1
1

apbFftAvg2
2

apbFftAvg4
4

apbFftAvg8
8

apbFftAvg16
16

apbFftAvg32
32

apbFftAvg64
64

apbFftAvg128
128

apbFftAvg256
256

apbFftAvg512
512

apbFftAvg1k
1024

apbFftAvg2k
2048

apbFftAvg4k
4096

Description This command sets the FFT Spectrum Analyzer number of FFT averages.

FFT has the ability to average a number of successive acquisitions and spectrum analyses of a signal and display the averaged result. Since noise is random in amplitude and phase, averaging a succession of noise measurements results in a degree of cancellation and the averaged result will have less variance than the initial acquisition. Coherent signals, however, are the same at each acquisition and thus are not affected by averaging. Thus, spectral averaging will reduce the maximum peak excursions of the noise baseline in a typical signal spectrum while not affecting continuous signals, making it easier to detect and measure low amplitude signals and distortion products. Averaging over many seconds or minutes of program material such as music or voice may also be useful in order to determine the long-term average amplitude versus frequency distribution.

See Also `ATS2.Inst.FFT.AveragesType`

Example

```
Sub Main
  ATS.File.OpenTest "FFTTEST1.ATS2"
  With ATS2.Inst.FFT
     .InputFormat = apbFFTAnalog
     .AverageType = apbFFTPower
     .Averages = apbFFTAvg16
     .AcquireLength = apbFFTAcq10k
     .TransformLength = apbFFT8k
     .StartTime("sec") = 0
     .SubtractDC = apbFFTDCSubAvg
     .WfmDisplay = apbFFTInterpolate
```

```
        .Window = apbFFTBlackmanHarris
        .TrigDelay("sec") = 0.000000
        .TrigSource = apbFFTOff
        .TrigSensitivity("dBFS") = -59.999594
        .TrigPolarity = apbPos
    End With
    ATS.Sweep.Start
End Sub
```

ATS2.Inst.FFT.AveragesType — Property

Syntax **ATS2.Inst.FFT.AveragesType**

Data Type Constant

The following list contains the selections relevant to the ATS2.Inst.FFT.Window command Blackman-Harris, Hann, Flat-Top, Equiripple, and None Window selections.

apbFFTPower
: Power (spectrum only)

apbFFTSyncRealign
: Sync, re-align

apbFFTSync
: Sync

The following list contains the selections relevant to the ATS2.Inst.FFT.Window command None, move to bin center Window selection.

apbFFTPower
: Power (spectrum only)

apbFFTSyncRealignCenter
: Sync, re-align, move center first

apbFFTSyncRealignAverage
: Sync, re-align, average first

apbFFTSyncCenter
Sync, move center first

apbFFTSyncAverage
Sync, average first

Description This command sets the type of Averaging the FFT Spectrum Analyzer uses when producing Time and Frequency domain measurements.

This command enables or disables computation of the average value of all samples in the acquisition buffer and subtraction that computed value from the value of each sample before an FFT transform or processing the values according to the Wave Display field and sending the results to the computer for display. The effect of the Subtract Average Value function is thus very similar having used AC coupling before acquiring the signal, as long as no signal peaks exceeded digital full scale. Use of the Subtract Average Value function may be valuable when examining low-level signals which contain a significant amount of DC offset, particularly in time domain (oscilloscope) presentations where the DC offset might otherwise cause the signal to be off-screen at the selected vertical span.

See Also `ATS2.Inst.FFT.Averages`

Example See example for `ATS2.Inst.FFT.Averages`.

ATS2.Inst.FFT.Rdg — Property

Syntax **`ATS2.Inst.FFT.Rdg(`**`ByVal` *`Channel`* `As Constant, ByVal` *`Unit`* `As String`**`)`**

Data Type Double

Parameter

Name	Description
Channel	apbChA = Select channel A apbChB = Select channel B
Unit	String that designates the desired unit. The following units are valid for this command: FFS, %FS, dBFS, Bits.

Description This command returns a unsettled reading for the FFT Spectrum Analyzer Peak Monitor meter and zeros the ready count.

See Also `ATS2.Inst.FFT.Ready, ATS2.Inst.FFT.Trig`

Example

```
Sub Main
  ATS.File.OpenTest "FFTTEST2.ATS2"
  With ATS2.Inst.FFT
     .Trig(apbChA)
     Do
     Ready = .Ready(apbChA)
     Loop Until .Ready(apbChA)
     AReading = ATS2.Inst.FFT.Rdg(apbChA, "FFS")
  ATS.Prompt.Text = "Ch A Monitor " _
     & Left(Str$(AReading),6) & "FFS"
  ATS.Prompt.ShowWithContinue
  Beep
  Stop
End Sub
```

ATS2.Inst.FFT.Ready — Property

Syntax **`ATS2.Inst.FFT.Ready(`**`ByVal` *`Channel`* `As Constant`**`)`**

Data Type Integer

0	Reading not ready.
>0	Reading ready.

Parameter

Name	Description
Channel	apbChA = Select channel A apbChB = Select channel B

Description This command returns the FFT Spectrum Analyzer Peak Monitor meter unsettled reading ready count.

Because readings do not return until a reading is ready, this command may be used to avoid waiting for a reading. This command does NOT zero the ready count and so may be called any

number of times. Only a call to the `ATS2.Inst.FFT.Rdg` or `ATS2.Inst.FFT.Trig` commands will zero the ready count.

If the reading is found to be ready, a call to the `ATS2.Inst.FFT.Rdg` command will be guaranteed to return quickly.

See Also `ATS2.Inst.FFT.Rdg, ATS2.Inst.FFT.Trig`

Example See example for `ATS2.Inst.FFT.Rdg`.

ATS2.Inst.FFT.Trig — Method

Syntax **`ATS2.Inst.FFT.Trig(`**`ByVal` *`Channel`* `As Constant`**`)`**

Parameter

Name	Description
`Channel`	apbChA = Select channel A apbChB = Select channel B

Description Causes a restart of the reading cycle and zeros the ready count for the `ATS2.Inst.FFTGen.Rdg` command. The reading in progress is aborted.

See Also `ATS2.Inst.FFT.Rdg, ATS2.Inst.FFT.Ready`

Example See example for `ATS2.Inst.FFT.Rdg`.

ATS2.Inst.FFT.InputFormat — Property

Syntax **`ATS2.Inst.FFT.InputFormat`**

Data Type Constant

`apbFftDigital`
Digital

`apbFftAnalog`
Analog

`apbFftJitterSec`
ChA Analog / ChB Jitter(UI)

apbFftJitterUI

ChA Analog / ChB Jitter(sec)

Description This command sets the FFT Spectrum Analyzer Input Format.

Example See example for `ATS2.Inst.FFT.Averages`.

ATS2.Inst.FFT.StartTime Property

Syntax **`ATS2.Inst.FFT.StartTime(`**`ByVal` *`Unit`* `As String`**`)`**

Data Type Double — The acceptable range of numbers depends upon the sample Rate set on the Digital I/O panel, since the acquisition buffer is a fixed length in samples. At a 48 kHz sample rate, for example, the Start Time field will accept numbers between plus and minus 341 milliseconds.

Parameter

Name	Description
Unit	String that designates the desired unit. The following units are valid for this command: sec.

Description This command sets the FFT Spectrum Analyzer Start Time.

FFT permits the user to select any point in the acquired signal record as the beginning of the portion to be transformed. The FFT transform is then computed for the contiguous section of samples starting at that sample and continuing for the number of samples chosen in the Length field. FFT thus permits selective spectrum analysis of different sections of a complex signal such as program material or special test signals such as sinewave bursts.

If the original signal acquisition (F9) was made with a negative value in the Pre-trigger Time field, negative values up to and including that same value may be used as FFT Start Time values to permit spectrum analysis of the pre-trigger section of the acquired record.

Example See example for `ATS2.Inst.FFT.Averages`.

ATS2.Inst.FFT.SubtractDC

Property

Syntax `ATS2.Inst.FFT.SubtractDC`

Data Type Constant

0	DC Coupled
1	Subtract Average
2	Subtract 1/2pk-pk

Description This command sets the FFT Spectrum Analyzer DC offset processing mode.

Example See example for `ATS2.Inst.FFT.Averages`.

ATS2.Inst.FFT.TransformLength

Property

Syntax `ATS2.Inst.FFT.TransformLength`

Data Type Constant

apbFFT256	256
apbFFT512	512
apbFFT1k	1024
apbFFT2k	2048
apbFFT4k	4096
apbFFT8k	8192
apbFFT16k	16384
apbFFT32k	32768

Description This command sets the FFT Spectrum Analyzer FFT length.

Example See example for `ATS2.Inst.FFT.Averages`.

ATS2.Inst.FFT.TrigDelay Property

Syntax **`ATS2.Inst.FFT.TrigDelay(`**`ByVal` *`Unit`* `As String`**`)`**

Data Type Double

Parameter

Name	Description
`Unit`	String that designates the desired unit. The following units are valid for this command: sec.

Description This command sets the FFT Spectrum Analyzer Trigger Delay time.

FFT has the ability to fill the acquisition buffer with signal samples starting at a user-defined time before the trigger occurs, then continuing until the buffer is full. This permits analysis of signal conditions both before and after the triggering event. A negative value entered in the Trigger Delay field determines how much time (and how many samples) prior to the trigger event are retained. The Pre-Trigger Time field is visible only on the large form of the Digital Analyzer panel. The total length of signal acquired will be as set in FFT Transform Length, with the remainder of the acquisition buffer filled after the trigger. For example, with maximum memory the length of the acquisition buffer for each channel is 341 milliseconds at a 48 kHz rate. If the Pre-Trigger Time value is -50 milliseconds, for example, then 291 additional milliseconds of signal following the trigger will also be acquired to fill the entire 341 ms buffer.

Pre-trigger data is acquired in this fashion: when the F9 key is pressed or Go is clicked, FFT and the DSP module immediately begin acquiring data samples, even though no trigger event may have yet occurred. If the acquisition buffer should completely fill before a trigger event occurs, data continues to be acquired in a FIFO (first in first out) basis with the oldest data being dropped as new data is added. When the trigger event occurs, FFT effectively creates a marker at that location (time zero) and another marker at the pre-trigger time before time zero and continues acquiring until every

location up to the pre-trigger marker is filled. Any portion from the pre-trigger time through time zero to the end of the record may then be displayed in oscilloscope fashion or transformed and viewed as a spectrum analysis.

Example See example for `ATS2.Inst.FFT.Averages`.

ATS2.Inst.FFT.TrigLevel Property

Syntax **`ATS2.Inst.FFT.TrigLevel(`**`ByVal` *`Unit`* `As String`**`)`**

Data Type Double — The acceptable range of numbers is between plus and minus 1 for the FFS unit.

Parameter

Name	Description
`Unit`	String that designates the desired unit. The following units are valid for this command: FFS, FS, and dBFS.

Description This command sets the FFT Spectrum Analyzer Trigger Level. This control determines the signal level that must be obtained before a trigger event can occur. Once the Trigger event occurs the next and following samples are placed into the acqusition buffer until full.

Example See example for `ATS2.Inst.FFT.Averages`.

ATS2.Inst.FFT.TrigPolarity Property

Syntax **`ATS2.Inst.FFT.TrigPolarity`**

Data Type Constant

`apbTrigSlopePos`
: Positive: time zero will be the first positive-going zero crossing of the trigger signal selected in the Trigger Source field.

`apbTrigSlopeNeg`
: Negative: time zero will be the first negative-going zero crossing of the selected trigger signal.

Description This command sets the FFT Spectrum Analyzer trigger polarity.

Example See example for `ATS2.Inst.FFT.Averages`.

ATS2.Inst.FFT.TrigSensitivity Property

Syntax **`ATS2.Inst.FFT.TrigSensitivity(`**`ByVal` *`Unit`* `As String`**`)`**

Data Type Double — The acceptable range of numbers is between plus and minus 1 for the FFS unit.

Parameter

Name	Description
`Unit`	String that designates the desired unit. The following units are valid for this command: FFS, FS, and dBFS.

Description This command sets the FFT Spectrum Analyzer Trigger Sensitivity. This control determines the signal level that must be obtained before a zero crossing trigger event can occur.

Example See example for `ATS2.Inst.FFT.Averages`.

ATS2.Inst.FFT.TrigSource Property

Syntax **`ATS2.Inst.FFT.TrigSource`**

Data Type Constant

`apbFFTOff`
: Free Run: signal acquisition begins immediately after F9 or Go is initiated, regardless of signal amplitude. This is the typical operating mode with steady-state test signals.

`apbFFTChAAuto`
: Ch. A Auto:

`apbFFTChAFixed`
: Ch. A Fixed:

`apbFFTChBAuto`
: Ch. B Auto:

apbFFTChBFixed

Ch. B Fixed:

apbFFTExternal

Trig In (Ext): The External selection refers to pin 3 of the 15-pin D-sub connector on the rear of the DSP module. This source is operational only with the SYS-2300 series Dual Domain units. If pin 3 is high (or open circuit, in which case it is pulled high by an internal pull-up resistor), triggering occurs at the next digital sample. Pulling pin 3 low from an external device holds off triggering, with acquisition being triggered on the next sample after pin 3 is pulled high. This External selection is unaffected by the Slope buttons.

apbFFTDGen

Digital Gen: The Digital Generator selection functions only on Dual Domain units (SYS-2300 series). If the Digital Generator is generating any of the waveforms selectable in the Waveform field, a Digital Generator trigger occurs at each zero crossing of the waveform, positive-going or negative-going as selected by the Slope buttons. If the Digital Generator is generating a signal from a waveform file, a Digital Generator trigger occurs as the first sample is read from the waveform file.

apbFFTAGen

Analog Gen: The Analog Generator Sync selection is the same signal as at the Generator Aux Signals Sync Output BNC on the front panel of ATS. This signal is a squarewave at the Analog Generator frequency in sinewave and squarewave waveforms, the envelope of the burst signal in all Burst waveforms, a squarewave at the lower IMD frequency in SMPTE IMD waveform, a squarewave at 1/2 the frequency spacing in CCIF IMD waveform, the squarewave IMD signal in DIM IMD waveform, and a pulse at the pseudo-random repetition rate in Pseudo noise modes. There is no signal in Random noise modes.

apbFFTACMains

Line (Mains): the power line frequency.

apbFFTJitterGen

Jitter Gen: The Digital Input/Output Jitter Generator selection provides a trigger at each positive or negative zero crossing for the selected waveform type.

apbFFTChAFixedLev

Ch. A Fixed Level

apbFFTChBFixedLev

Ch. B Fixed Level

Description This command sets the FFT Spectrum Analyzer Trigger Source.

The four channel A and channel B selections are software triggers, monitoring the signal (which may come from Digital or A/D sources) on the specified channel. channel A Fix and channel B Fix use a fixed threshold of 1.0%FS (-40 dBFS) on the channel referred to as the triggering threshold, and will trigger on the first signal excursion of the selected slope (Positive or Negative radio button) above that amplitude. The channel A and B Auto selections will cause triggering at one-half the peak-to-peak value if the selected channel has a signal amplitude greater than digital zero.

Example See example for `ATS2.Inst.FFT.Averages`.

ATS2.Inst.FFT.WfmDisplay Property

Syntax **`ATS2.Inst.FFT.WfmDisplay`**

Data Type Constant

apbFFTInterpolate

Interpolate

apbFFTSample

Display Samples

apbFFTPeak

Peak Values

apbFFTAbsolute

Absolute Values

Description This command sets the FFT Spectrum Analyzer generator waveform display mode.

When Interpolate is selected, the DSP module will perform an interpolation calculation based on the assumption that the signal was band-limited by a low-pass filter before sampling. The Interpolate selection produces a much more accurate display of the signal waveform when the signal frequency is high (such as sample rate/100 or higher).

When Display Samples is selected, no processing takes place in the DSP module. At each time value plotted on the X-axis, the DSP simply sends the amplitude of the nearest-in-time acquired sample to the computer for plotting. When the signal frequency is low compared to the sample rate, this may produce an acceptable representation of the original signal waveform. At high signal frequencies, the waveform may be entirely unrecognizable in the Display Samples mode. For example, a 16 kHz sinewave acquired at the 48 kHz sample rate will have each cycle of waveform represented by only three amplitude samples and the result will look very little like a sinewave. The Display Samples mode may be useful when examining the true quantization-limited waveforms of very low amplitude digital domain signals.

When Peak Values is selected, the DSP searches all sample amplitudes in the acquisition buffer between each pair of X-axis time values plotted and returns to the computer the largest positive or negative value in that span, preserving the sign. The intended use of the Peak Values mode is when graphing a relatively long time span on the X-axis, where the combination of Start-to-Stop time span and Steps value on the Sweep panel results in skipping across many actual acquired samples between plotted points. For example, assume a signal is acquired at the 48 kHz sample rate (20.8 microseconds between samples). If the waveform of that signal is being viewed from 0 to 200 milliseconds with 400 steps, the time span between plotted points on the graph X-axis is 0.5 milliseconds (500 microseconds). There are approximately 24 samples between plotted points. If Peak Values or Absolute Values modes are not used, an unfortunate combination of signal frequency, X-axis span, and Points value can make it appear that no waveform, a near-DC signal,

or a waveform at a completely different frequency is present. Since Peak Values searches through all sample values within each span between plotted points and sends the largest value to be plotted, signals cannot be missed.

When Absolute Values mode is selected, the DSP searches all sample amplitudes in each plotted-point-to-plotted-point span as it does in Peak Values mode, but takes the absolute value of the largest positive or negative value and always sends a positive number to the computer. The advantage of Absolute Values mode is that logarithms may be computed when all numbers are positive, so a dB unit may be used on the Y axis to display the waveform. Waveform display with Absolute Values mode can create a wide dynamic range oscilloscope which displays the envelope of an audio signal, calibrated in familiar dB units such as dBV, dBu, etc. Absolute Values mode is most effective when the X-axis span and Points values are selected to produce approximately two plotted points per cycle of the waveform being plotted. For example, if an envelope display of tone burst waveforms of a 1 kHz signal (1 millisecond period) are being plotted across a 50 millisecond span, the Points value on the Sweep panel should be set to approximately 100.

Example See example for `ATS2.Inst.FFT.Averages`.

ATS2.Inst.FFT.Window — Property

Syntax **`ATS2.Inst.FFT.Window`**

Data Type Constant

`apbFftBlackmanHarris`
Blackman-Harris

`apbFftHann`
Hann

`apbFftFlatTop`
Flat-Top

`apbFftEquiripple`
Equiripple

apbFftNone
: None

apbFftNoneMoveToBinCenter
: None, move to bin center

apbFftHamming
: Hamming

apbFftGaussian
: Gaussian

apbFftRifeVincent4
: Rife-Vincent 4

apbFftRifeVincent5
: Rife-Vincent 5

Description This command sets the FFT Spectrum Analyzer Window selection. See Appendix C for FFT Window Descriptions.

See Also `ATS2.Inst.FFT.AveragesType`

Example See example for `ATS2.Inst.FFT.Averages`.

User Notes

Chapter 29

Harmonic Distortion Analyzer

ATS2.Inst.Harmonic.AmplRdg — Property

Syntax

```
ATS2.Inst.Harmonic.AmplRdg(ByVal Channel As Constant, ByVal Unit As String)
```

Data Type Double

Parameter

Name	Description
Channel	apbChA = Select channel A apbChB = Select channel B
Unit	The following units are available: Hz, F/R, dHz, %Hz, cent, octs, decs, d%, dPPM.

Description This command returns a settled reading for the Harmonic Analyzer Fundamental Amplitude meter and zeros the ready count.

See Also ATS2.Inst.Harmonic.AmplReady, ATS2.Inst.Harmonic.AmplSettling, ATS2.Inst.Harmonic.AmplTrig

Example

```
Sub Main
  ATS.Application.NewTest
  ATS2.AGen.OutputOn = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS2.Inst.Program = apbInstHarmonicAnalyzer
  With ATS2.Inst.Harmonic
     .InputFormat = apbInstInAnalog
     .AmplSettling(apbChA, 1.0, 0.000001, "V", _
        3, 0.03, apbExponential)
     .AmplSettling(apbChA, 0.5, 0.01, "Hz", 3, _
        0.03, apbExponential)
     Wait .5
     .AmplTrig(apbChA)
     .FreqTrig(apbChA)
```

```
      Do
      Loop Until .AmplReady(apbChA) _
         And .FreqReady(apbChA)
      var1 = .AmplRdg(apbChA, "V")
      var2 = .FreqRdg(apbChA, "Hz")
   End With
   Text1$= "Channel A Fundamental Amplitude " & _
      Str$(Format(var1, "##.000")) & "V"
   Text2$= "Channel A Fundamental Frequency " & _
      Str$(Format(var2, "##.000")) & "Hz"
   ATS.Prompt.Text = Text1$ & vbCr & Text2$ _
   ATS.Prompt.ShowWithContinue
   Stop
End Sub
```

ATS2.Inst.Harmonic.AmplReady — Property

Syntax **ATS2.Inst.Harmonic.AmplReady(**ByVal *Channel* As Constant**)**

Data Type Integer

0	Reading not ready.
>0	Reading ready.

Parameter

Name	Description
Channel	apbChA = Select channel A apbChB = Select channel B

Description This command returns the Harmonic Distortion Analyzer Fundamental Amplitude settled reading ready count.

Because readings do not return until a reading is ready, this command may be used to avoid waiting for a reading. This command does NOT zero the ready count and so may be called any number of times. Only a call to the `ATS2.Inst.Harmonic.AmplRdg` or `ATS2.Inst.Harmonic.AmplTrig` commands will zero the ready count.

If the reading is found to be ready, a call to the `ATS2.Inst.Harmonic.AmplRdg` command will be guaranteed to return quickly.

See Also `ATS2.Inst.Harmonic.AmplRdg`, `ATS2.Inst.Harmonic.AmplSettling`, `ATS2.Inst.Harmonic.AmplTrig`

Example See example for `ATS2.Inst.Harmonic.AmplRdg`.

ATS2.Inst.Harmonic.AmplSettling — Method

Syntax **`ATS2.Inst.Harmonic.AmplSettling(`**`ByVal` *`Channel`* `As Integer, ByVal` *`Tolerance`* `As Double, ByVal` *`Floor`* `As Double, ByVal` *`FloorUnit`* `As String, ByVal` *`Points`* `As Integer, ByVal` *`Delay`* `As Double, ByVal` *`Algorithm As Constant`***`)`**

Parameter See Appendix A for Settling Algorithm and parameter name descriptions.

Description This command sets the settling parameters for the `ATS2.Inst.Harmonic.AmplRdg` command.

See Also `ATS2.Inst.Harmonic.AmplRdg`, `ATS2.Inst.Harmonic.AmplReady`, `ATS2.Inst.Harmonic.AmplTrig`

Example See example for `ATS2.Inst.Harmonic.AmplRdg`.

ATS2.Inst.Harmonic.AmplTrig — Method

Syntax **`ATS2.Inst.Harmonic.AmplTrig(`**`ByVal` *`Channel`* `As Constant`**`)`**

Parameter

Name	Description
`Channel`	apbChA = Select channel A apbChB = Select channel B

Description Causes a restart of the reading cycle and zeros the ready count for the `ATS2.Inst.Harmonic.AmplRdg` command. The reading in progress is aborted.

See Also `ATS2.Inst.Harmonic.AmplRdg`, `ATS2.Inst.Harmonic.AmplReady`, `ATS2.Inst.Harmonic.AmplSettling`

Example See example for `ATS2.Inst.Harmonic.AmplRdg`.

ATS2.Inst.Harmonic.Freq — Property

Syntax **`ATS2.AGen.Freq(`**`ByVal` *`Unit`* `As String`**`)`**

Data Type Double

Parameter

Name	Description
`Unit`	String that designates the desired unit. The following units are valid for this command: Hz, F/R, dHz, %Hz, cent, octs, decs, d%, dPPM

Description This command sets the Harmonic Distortion Analyzer tuning frequency.

See Also `ATS2.Inst.Harmonic.Tuning`

Example

```
Sub Main
  ATS.Application.NewTest
  ATS2.AGen.OutputOn = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS2.Inst.Selection = apbInstHarmonicAnalyzer
  With ATS2.Inst.Harmonic
     .Harmonics(apbChA, apbHarmSum1) = 2
     .Tuning = apbHarmFixed
     .Freq("Hz") = 1000.0
     .Selectivity = apbHarmHiSpeed
  End With
  ATS.Sweep.Data(1).Id = 6129
  ATS.Sweep.Data(1).Top("FFS") = 1.0
  ATS.Sweep.Data(1).Bottom("FFS") = 0.0
  ATS.Sweep.Source(1).Start("Hz") = 1000.0
```

```
    ATS.Sweep.Source(1).Stop("Hz") = 3000.0
    ATS.Sweep.Source(1).LogLin = apbLin
    ATS.Sweep.Source(1).Steps = 100
    ATS.Sweep.Start
    ATS2.Inst.Harmonic.Selectivity = apbHarmHiAccuracy
    ATS.Sweep.Append = True
    ATS.Sweep.Start
    ATS.Graph.Comment = "Hi-Speed and Hi-Accuracy _
       measurement bandwidth."
End Sub
```

ATS2.Inst.Harmonic.FreqRdg — Property

Syntax `ATS2.Inst.Harmonic.FreqRdg(ByVal` *Channel* `As Constant, ByVal` *Unit* `As String)`

Data Type Double

Parameter

Name	Description
Channel	apbChA = Select channel A apbChB = Select channel B
Unit	The following units are available: Hz, F/R, dHz, %Hz, cent, octs, decs, d%, dPPM.

Description This command returns a settled reading for the Harmonic Distortion Analyzer Frequency meter and zeros the ready count.

See Also `ATS2.Inst.Harmonic.FreqReady`, `ATS2.Inst.Harmonic.FreqSettling`, `ATS2.Inst.Harmonic.FreqTrig`

Example See example for `ATS2.Inst.Harmonic.AmplRdg`.

ATS2.Inst.Harmonic.FreqReady — Property

Syntax `ATS2.Inst.Harmonic.FreqReady(ByVal` *Channel* `As Constant)`

Data Type Integer

0	Reading not ready.
>0	Reading ready.

Parameter	Name	Description
	Channel	apbChA = Select channel A apbChB = Select channel B

Description This command returns the Harmonic Distortion Analyzer Frequency settled reading ready count.

Because readings do not return until a reading is ready, this command may be used to avoid waiting for a reading. This command does NOT zero the ready count and so may be called any number of times. Only a call to the `ATS2.Inst.Harmonic.FreqRdg` or `ATS2.Inst.Harmonic.FreqTrig` commands will zero the ready count.

If the reading is found to be ready, a call to the `ATS2.Inst.Harmonic.FreqRdg` command will be guaranteed to return quickly.

See Also `ATS2.Inst.Harmonic.FreqRdg`, `ATS2.Inst.Harmonic.FreqSettling`, `ATS2.Inst.Harmonic.FreqTrig`

Example See example for `ATS2.Inst.Harmonic.AmplRdg`.

ATS2.Inst.Harmonic.FreqSettling — Method

Syntax **`ATS2.Inst.Harmonic.FreqSettling(`**`ByVal` *`Channel`* `As Integer, ByVal` *`Tolerance`* `As Double, ByVal` *`Floor`* `As Double, ByVal` *`FloorUnit`* `As String, ByVal` *`Points`* `As Integer, ByVal` *`Delay`* `As Double, ByVal` *`Algorithm As Constant`***`)`**

Parameter See Appendix A for Settling Algorithm and parameter name descriptions.

Description This command sets the settling parameters for the `ATS2.Inst.Harmonic.FreqRdg` command.

See Also `ATS2.Inst.Harmonic.FreqRdg`, `ATS2.Inst.Harmonic.FreqReady`, `ATS2.Inst.Harmonic.FreqTrig`

Example See example for `ATS2.Inst.Harmonic.AmplRdg`.

ATS2.Inst.Harmonic.FreqTrig — Method

Syntax **`ATS2.Inst.Harmonic.FreqTrig(`**`ByVal` *`Channel`* `As Constant`**`)`**

Parameter	Name	Description
	`Channel`	apbChA = Select channel A apbChB = Select channel B

Description Causes a restart of the reading cycle and zeros the ready count for the `ATS2.Inst.Harmonic.FreqRdg` command. The reading in progress is aborted.

See Also `ATS2.Inst.Harmonic.FreqRdg`, `ATS2.Inst.Harmonic.FreqReady`, `ATS2.Inst.Harmonic.FreqSettling`

Example See example for `ATS2.Inst.Harmonic.AmplRdg`.

ATS2.Inst.Harmonic.Harmonics — Property

Syntax **`ATS2.Inst.Harmonic.Harmonics(`**`ByVal` *`Channel`* `As Constant, ByVal` *`Sum`* `As Constant`**`)`**

Data Type Integer

Single decimal value or the sum of several decimal values representing multiple harmonics or a constant value as defined below.

Decimal value / Harmonic table:
2 = Harmonic 2 On

4 = Harmonic 3 On
8 = Harmonic 4 On
16 = Harmonic 5 On
32 = Harmonic 6 On
64 = Harmonic 7 On
128 = Harmonic 8 On
256 = Harmonic 9 On
512 = Harmonic 10 On
1024 = Harmonic 11 On
2048 = Harmonic 12 On
4096 = Harmonic 13 On
8192 = Harmonic 14 On
16384 = Harmonic 15 On

Constants table:
apbAll = Select all harmonics.
apbEven = Select all even harmonics.
apbNone = Select None of the harmonics.
apbOdd = Select all odd harmonics.

Parameter

Name	Description
Channel	apbChA = Select channel A apbChB = Select channel B
Sum	apbSum1 = Select Sum 1 apbSum2 = Select Sum 2

Description This command adds or removes individual or as a group harmonics from the Harmonic Distortion Analyzer RSS summation for the specified Channel and Sum number.

Example See example for `ATS2.Inst.Harmonic.Rdg`.

ATS2.Inst.Harmonic.InputFormat Property

Syntax **`ATS2.Inst.Harmonic.InputFormat`**

Data Type Constant

apbInstInDigital
Digital

apbInstInAnalog
Analog

Description This command sets the Harmonic Distortion Analyzer Input Format.

Example See example for `ATS2.Inst.Harmonic.FreqRdg`.

ATS2.Inst.Harmonic.Rdg — Property

Syntax

```
ATS2.Inst.Harmonic.Rdg(ByVal Channel As Constant, ByVal Sum As Integer, ByVal Unit As String)
```

Data Type Double

Parameter

Name	Description
Channel	apbChA = Select channel A apbChB = Select channel B
Sum	apbSum1 = Select Sum 1 apbSum2 = Select Sum 2
Unit	The following units are valid for the "Absolute Units" selection of the ATS2.Inst.Harmonic.RelUnits command: FFS, %FS, dBFS, Bits, V, Vp, Vpp, dBu, dBV, dBr 1, dBr 2. The following units are valid for the "Relative Units" selection of the ATS2.Inst.Harmonic.RelUnits command: %, dB, PPM, X/Y

Description This command returns a settled reading for the Harmonic Distortion Analyzer Harmonic Sum meter and zeros the ready count.

See Also `ATS2.Inst.Harmonic.Ready`, `ATS2.Inst.Harmonic.Settling`, `ATS2.Inst.Harmonic.Trig`

Example

```
Sub Main
  ATS.Application.NewTest
  ATS2.AGen.OutputOn = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
```

```
ATS2.Inst.Selection = apbInstHarmonicAnalyzer
With ATS2.Inst.Harmonic
   .InputFormat = apbInstInAnalog
   .Harmonics(apbChA, apbHarmSum1) = 2
   .Harmonics(apbChA, apbHarmSum2) = 4
   .RatioUnits(apbChA, apbHarmSum1) = False
   .RatioUnits(apbChA, apbHarmSum2) = False
   .Settling(apbChA, apbHarmSum1, 0.5, -1.2e+002, _
      "dBV", 1, 0.002, apbFlat)
   .Settling(apbChA, apbHarmSum2, 0.5, -1.2e+002, _
      "dBV", 1, 0.002, apbFlat)
   .Trig(apbChA, apbHarmSum1)
   .Trig(apbChA, apbHarmSum2)
   Do
   Loop Until .Ready(apbChA, apbHarmSum1) _
      And .Ready(apbChA, apbHarmSum2)
   var1 = .Rdg(apbChA, apbHarmSum1, "dBV")
   var2 = .Rdg(apbChA, apbHarmSum2, "dBV")
End With
Text1$= "Channel A Sum1 " & _
   Str$(Format(var1, "##.000")) & "dBV"
Text2$= "Channel A Sum2 " & _
   Str$(Format(var2, "##.000")) & "dBV"
ATS.Prompt.Text = Text1$ & Chr$(13) & Text2$
ATS.Prompt.ShowWithContinue
Stop
End Sub
```

ATS2.Inst.Harmonic.Ready — Property

Syntax **ATS2.Inst.Harmonic.Ready(**ByVal *Channel* As Constant, ByVal *Sum* As Integer**)**

Data Type Integer

0	Reading not ready.
>0	Reading ready.

Parameter	Name	Description
	Channel	apbChA = Select channel A apbChB = Select channel B
	Sum	apbSum1 = Select Sum 1 apbSum2 = Select Sum 2

Description This command returns the Harmonic Distortion Analyzer Harmonic Sum settled reading ready count.

Because readings do not return until a reading is ready, this command may be used to avoid waiting for a reading. This command does NOT zero the ready count and so may be called any number of times. Only a call to the `ATS2.Inst.Harmonic.Rdg` or `ATS2.Inst.Harmonic.Trig` commands will zero the ready count.

If the reading is found to be ready, a call to the `ATS2.Inst.Harmonic.Rdg` command will be guaranteed to return quickly.

See Also `ATS2.Inst.Harmonic.Rdg`, `ATS2.Inst.Harmonic.Settling`, `ATS2.Inst.Harmonic.Trig`

Example See example for `ATS2.Inst.Harmonic.Rdg`.

ATS2.Inst.Harmonic.RatioUnits Property

Syntax **`ATS2.Inst.Harmonic.RatioUnits(`**`ByVal` *`Channel`* `As Constant, ByVal` *`Sum`* `As Integer`**`)`**

Data Type Boolean

True	Ratio Units.
False	Absolute Units.

Parameter	Name	Description
	Channel	apbChA = Select channel A apbChB = Select channel B

Sum apbSum1 = Select Sum 1
apbSum2 = Select Sum 2

Description This command selects the units that are avalible for the `ATS2.Inst.Harmonic.Rdg` command

Example See example for `ATS2.Inst.Harmonic.Rdg`.

ATS2.Inst.Harmonic.Selectivity — Property

Syntax **`ATS2.Inst.Harmonic.Selectivity`**

Data Type Integer

apbHarmHiSpeed
Hi-Speed: In this mode measurement selectivity is reduced to improve measurement speed. Rapid readings of changing conditions are best done in this mode.

apbHarmHiAccuracy
Hi-Accuracy: In this mode measurement selectivity is increased to reduce the noise contribution to the measurement. Frequency and amplitude accuracy is improved.

Description This command sets the Harmonic Distortion Analyzer measurement mode.

Example See example for `ATS2.Inst.Harmonic.Freq`.

ATS2.Inst.Harmonic.Settling — Method

Syntax **`ATS2.Inst.Harmonic.Settling(`**`ByVal` *`Channel`* `As Constant, ByVal` *`Sum`* `As Constant, ByVal` *`Tolerance`* `As Double, ByVal` *`Floor`* `As Double, ByVal` *`FloorUnit`* `As String, ByVal` *`Points`* `As Integer, ByVal` *`Delay`* `As Double, ByVal` *`Algorithm As Constant`*`)`

Parameter See Appendix A for Settling Algorithm and parameter name descriptions.

Description This command sets the settling parameters for the `ATS2.Inst.Harmonic.Rdg` command.

See Also `ATS2.Inst.Harmonic.Rdg`, `ATS2.Inst.Harmonic.Ready`, `ATS2.Inst.Harmonic.Trig`

Example See example for `ATS2.Inst.Harmonic.Rdg`.

ATS2.Inst.Harmonic.Trig — Method

Syntax **`ATS2.Inst.Harmonic.Trig(`**`ByVal` *`Channel`* `As Constant, ByVal Sum As Integer`**`)`**

Parameter

Name	Description
Channel	apbChA = Select channel A apbChB = Select channel B
Sum	apbSum1 = Select Sum 1 apbSum2 = Select Sum 2

Description Causes a restart of the reading cycle and zeros the ready count for the `ATS2.Inst.Harmonic.Ch1Sum1Rdg` command. The reading in progress is aborted.

See Also `ATS2.Inst.Harmonic.Rdg`, `ATS2.Inst.Harmonic.Ready`, `ATS2.Inst.Harmonic.Settling`

Example See example for `ATS2.Inst.Harmonic.Ch1Sum1Rdg`.

ATS2.Inst.Harmonic.Tuning — Property

Syntax **`ATS2.Inst.Harmonic.Tuning`**

Data Type Constant

`apbHarmAuto`

Counter Tuned: the frequency value measured by the Harmonic Distortion Analyzer Frequency counter is the filter steering source. This function would be selected when

making measurements from an external signal such as reproduction of a Compact Disc or digital audio tape or reception of a digital signal from a distant source.

apbHarmSweepTrack

Sweep Track: the filter tracks the frequency of whichever generator is selected in the Source 1 or Source 2 fields of the Sweep panel.

apbHarmAGenTrack

AGen Track: harmonic measurements track the frequency of the Analog Generator. This mode is useful for testing A/D converters driven from an analog output.

apbHarmDGenTrack

DGen Track: harmonic measurements track the frequency of the Digital Generator. This mode would normally be used when sweeping digital input- digital output devices with stimulus coming from the Digital Generator.

apbHarmFixed

Fixed: harmonic measurements are fixed, based on the frequency entered in the Freq field, unless the filter is being deliberately varied as part of a sweep test.

Description This command sets the Harmonic Distortion Analyzer Tuning Source.

Example See example for `ATS2.Inst.Harmonic.Freq`.

Chapter 30

INTERVU Digital Interface Analyzer

ATS2.Inst.Intervu.AcquisitionPosition — Property

Syntax `ATS2.Inst.Intervu.AcquisitionPosition`

Data Type Constant

apbIntervuPreTrig
Pre - Trigger

apbIntervuPostTrig
Post - Trigger.

Description This command configures the Digital Interface Analyzer Data Acquisition to occur befor or after the trigger.

See Also `ATS2.Trigger.Source`

Example See example for `ATS2.Trigger.Parity`.

ATS2.Inst.Intervu.Averages — Property

Syntax `ATS2.Inst.Intervu.Averages`

Data Type Constant

apbIntervuAvg1
1

apbIntervuAvg2
2

apbIntervuAvg4
4

apbIntervuAvg8
8

apbIntervuAvg16
16

apbIntervuAvg32
32

apbIntervuAvg64
64

apbIntervuAvg128
128

Description This command sets the Digital Interface Analyzer number of acquisition-and-processing cycles to average.

Example

```
Sub Main
  ATS.Application.NewTest
  ATS.Application.PanelClose(apbAnalogGen)
  ATS.Application.PanelClose(apbAnalyzer)
  ATS2.DGen.OutputOn = True
  ATS2.Inst.Selection = apbInstIntervuAnalyzer
  ATS2.Inst.Intervu.Averages = apbIntervuAvg16
  ATS2.Inst.Intervu.Window = apbIntervuNone
  ATS.Sweep.Data(1).Id = 6055
  ATS.Sweep.Source(1).Id = 5613
  ATS.S2CDio.OutJitterType = apbDioOutJitterSine
  ATS.S2CDio.OutJitterAmpl("sec") = 100e-9
  ATS.S2CDio.InFormat = apbDioInGenMon
  ATS.Sweep.Start
  ATS.Graph.OptimizeLeft
End Sub
```

ATS2.Inst.Intervu.JitterDetection — Property

Syntax **ATS2.Inst.Intervu.JitterDetection**

Data Type Constant

apbIntervueStableBits

Stable Bits: derives the stable reference clock at 1/4 the actual cell (bit) rate, synchronized to the beginning transition of the preamble. The serial signal consists of 32 cells (bits) per subframe and two subframes (left and right channels) per frame. The frame rate is equal to the sample rate of the embedded audio. Thus, there are 64 cells (bits) in a complete frame and the cell rate is 1/64 the audio sample rate. The first four cells of each subframe are the preamble. The preamble always starts with a three UI (1 1/2 cell) wide pulse followed by sequences of one UI, two UI, and three UI pulses which are different among the three possible preambles. There is no cell transition time within the preamble which is common to all three preambles. The highest rate at which transitions can be guaranteed to occur regularly is at 1/4 the cell rate, which includes the beginning and end of each preamble but no transitions within the preamble. This rate is 16 times the audio sample rate, so the effective jitter measurement bandwidth is eight times the audio sample rate (384 kHz at a 48 kHz sample rate).

apbIntervueAllBits

All Bits: derives the stable reference clock at the actual cell (bit) rate. Since there are 64 cells per frame and the frame rate is the audio sample rate, the reference clock is at 64 times the sample rate and the effective jitter measurement bandwidth is 32 times the audio sample rate (1.536 MHz at a 48 kHz sample rate). Since the preamble of each sub-frame will not have transitions at every cell boundary due to its three-UI-wide pulses (violations of bi-phase coding), the DSP interpolates where transitions would have occurred if the preamble did not violate bi-phase coding.

apbIntervuePreamble

Preambles: the average rate of the trailing edge of the first three-UI-wide pulse in each preamble as the stable clock reference. Each actual transition at the trailing edge of the first three-UI-wide preamble pulse is then compared to that reference (average value) to obtain jitter values for display

as jitter waveform, histogram of jitter, or FFT spectrum analysis of jitter. The three-UI pulse in a preamble is the most robust portion of the digital interface signal, since it is least affected by reduced bandwidth in the cable or system. Therefore, jitter measurements made with the Preamble Jitter Detection selection tend to be measurements of the intrinsic jitter in the transmitting device clock and are relatively unaffected by data jitter caused by reduced bandwidth. Since this derived reference clock rate is low (twice the audio sample rate), the effective jitter measurement bandwidth equals the audio sample rate when Preamble is selected.

apbIntervueSquareRising

Squarewave Rising: In addition to measuring jitter on an AES/EBU or SPDIF/EIAJ serial digital input signal, INTERVU can also measure jitter on any 28 kHz-13 MHz squarewave connected to the BNC digital input connector. This feature permits direct measurement of clock jitter on A/D and D/A converters.

The Squarewave Rising selection measures jitter on rising edges of the Squarewave signal.

Jitter is a measurement of the time deviation of zero crossings of a waveform compared to a reference perfect clock of the same average frequency. For AES/EBU and SPDIF/EIAJ waveforms, System Two determines the average clock frequency by measuring the frame rate of the serial digital input signal with a frequency counter. This frame frequency extraction circuitry is not functional for a squarewave signal, so the DIO panel Sample Rate field is not useful with squarewave input. INTERVU determines the average clock frequency to the best of its ability from its acquired signal. Since the acquired signal duration is approximately four milliseconds, the resulting frequency measurement is limited in resolution. The result is that the initial time domain graph of jitter of a squarewave input clock, plotted across the approximately four millisecond record duration, may appear as a ramp. The desired jitter

signal is the deviation from this ramp. The Compute Linearity function is used to extract variations from an underlying systematic variation such as this ramp.

apbIntervueSquareFalling

Squarewave Falling: The Squarewave Falling selection measures jitter on falling edges of the Squarewave signal.

Note: See additional text in Squarewave Rising selection above.

Description This command determines at which transitions the clock timing is compared to the interface signal..

Example See example for `ATS2.Inst.Intervu.WfmDisplay`.

ATS2.Inst.Intervu.TrigPolarity Property

Syntax **`ATS2.Inst.Intervu.TrigPolarity`**

Data Type Constant

apbPos

Positive: The data aqusitition will begin on the first positive-going zero crossing of the signal selected in the Trigger Source field.

apbNeg

Negative: The data aqusitition will begin on the first negative-going zero crossing of the selected signal selected in the Trigger Source field.

Description This command sets the Digital Interface Analyzer Trigger Polarity for the for the Trigger Source field Jitter Generator, External, Common Mode Signal, Interfering Noise, Digital Generator, and Input Zero Crossing selections.

See Also `ATS2.Trigger.Source`

Example See example for `ATS2.Trigger.Parity`.

ATS2.Inst.Intervu.WfmDisplay

Property

Syntax `ATS2.Inst.Intervu.WfmDisplay`

Data Type Constant

apbIntervueInterpolate

Interpolate: the DSP module will perform an interpolation calculation based on the fact that the signal was band-limited by an internal 30 MHz low-pass filter before sampling.

apbIntervueSamples

Display Samples: no processing takes place in the DSP module. At each time value plotted on the X-axis, the DSP simply sends the amplitude of the nearest-in-time acquired sample of the digital interface waveform to the computer for plotting. When displaying only a few pulses of the digital interface waveform, this is typically the best mode to use.

apbIntervuePeakValues

Peak Values: the DSP searches all sample amplitudes in the acquisition buffer between each pair of horizontal axis time values plotted and sends to the computer for plotting the largest positive or negative value in that span, preserving the plus or minus sign. The intended use of the Peak Values mode is when graphing pulse width histograms or a relatively long time span on the X-axis, where the combination of Start-to-Stop time span and Steps value on the Sweep panel results in skipping across many actual acquired samples between plotted points. If Peak Values mode is not used, an unfortunate combination of signal, X-axis span, and Points value can make it appear that no waveform, a near-DC signal, or a waveform at a completely different frequency is present. Since Peak Values searches through all sample values within each span between plotted points and sends the largest value to be plotted, signals cannot be missed.

apbIntervueEyePattern

Eye Pattern: Following acquisition of the digital interface signal and extraction of an average clock signal from it, the worst-case (nearest to zero Volts) amplitude is determined for each time increment relative to the beginning of each data cell. These values are plotted when Upper Eye Opening and Lower Eye Opening are selected as Data parameters, resulting in a plot of the worst-case inside of the eye.

Description This command provides four modes for processing the amplitude-versus-time relationship of a sampled digital interface signal before displaying the waveform. These modes are applicable to digital storage oscilloscope operation (amplitude versus time graphs) and histograms, but have no effect on FFT spectrum analysis.

Example

```
Sub Main
  ATS.File.OpenTest "INTERVU1.ATS2"
  With ATS2.Inst.Intervu
     .WfmDisplay = apbIntervuInterpolate
     .JitterDetection = apbIntervuStableBits
     ATS2.Trigger.Source = apbTrigXmitChBSub
     .Window = apbIntervuBlackmanHarris
  End With
  ATS.Sweep.Start
End Sub
```

ATS2.Inst.Intervu.Window — Property

Syntax **ATS2.Inst.Intervu.Window**

Data Type Constant

apbIntervuBlackmanHarris

Blackman-Harris

apbIntervuHann

Hann

apbIntervuFlatTop
Flat-Top

apbIntervuEquiripple
Equiripple

apbIntervuNone
None

Description This command sets the Digital Interface Analyzer Window selection. See Appendix C for FFT Window Discriptions.

Example See example for `ATS2.Inst.Intervu.WfmDisplay`.

Chapter 31

Analyzer Instrument Selection and Reference

ATS2.Inst.RefdBm — Property

Syntax `ATS2.Inst.RefdBm(ByVal Unit As String)`

Data Type Double — Reference value.

Parameters

Name	Description
Unit	The following units are available: Ohms.

Description This command sets the Analyzer dBm impedance value. This value of circuit impedance is used as the "R" value in the equation V2/R to compute power from the measured voltage (V), followed by decibel conversion.

See Also `ATS2.AnalogIn.Impedance.`

Example

```
Sub Main
  ATS.Application.NewTest
  ATS2.AGen.Output(apbChB) = False
  ATS2.AGen.Impedance = apbAgenHighZ
  ATS2.AGen.RefdBm("Ohms") = 600
  ATS2.AGen.Config = apbAGenUnBal
  ATS2.AGen.Ampl(apbChA, "dBm") = 0.0
  ATS2.AGen.OutputOn = True

  ATS2.AnalogIn.Source(apbChA) = apbAnalogInBNC_Unbal
  ATS2.AnalogIn.Impedance(apbChA) = apbInputHighZ

  AP.Inst.RefdBm("Ohms") = 600
  Reference = AP.Inst.RefdBm("Ohms")
  AP.Inst.Analyzer.FuncSettling(apbChA, 1.0, _
     .000002,  "V", 4, .05, apbFlat)
  AP.Inst.Analyze.FuncTrig(apbChA)
  Do
```

```
      Ready = AP.Inst.Analyze.FuncReady(apbChA)
   Loop Until Ready > 0
   Reading1 = AP.Inst.Analyze.FuncRdg(apbChA, "dBm")
   Debug.Print "Channel A Amplitude = _
      ";Format(Reading1, "#.0000");" dBm _
      (";Reference;" Ohms)"
End Sub
```

Output

```
Channel A Amplitude = -.0404 dBm ( 600 Ohms)
```

Comment This example requires that a XLR cable be connected between the Analog Generator channel A output and the Analog Analyzer channel A input.

ATS2.Inst.RefdBr — Property

Syntax **ATS2.Inst.RefdBr(**ByVal *Channel* As Constant, **ByVal** *Unit* As String**)**

Data Type Double

Parameter

Name	Description
Channel	apbChA = Select channel A reference. apbChB = Select channel B reference.
Unit	String that designates the desired unit. The following units are valid for the "Digital" selection of the ATS2.Inst.Analyzer.InputFormat command: FFS, %FS, dbFS, Bits, V, Vp, Vpp, dBu, dBV The following units are valid for the "Analog" selection of the ATS2.Inst.Analyzer.InputFormat command: V, dBV, dBu

Description This command sets a reference value for the dBr A or dBr B unit.

Example

```
Sub Main
   ATS.File.OpenTest "Ref1.ats2"
   ATS2.Inst.RefVFS("V") = 2
   ATS2.Inst.RefFreq("Hz") = 2000
   ATS2.Inst.RefdBr(apbChA, "FFS") = .5
```

```
   ATS2.Inst.RefdBr(apbChB, "FFS") = .75
   Wait .5
   With ATS2.Inst.Analyzer
      F_reading = .FreqRdg(apbChA, "%Hz")
      L_reading = .LevelRdg(apbChA, "dBrB")
      A_reading = .FuncRdg(apbChA, "dBrA")
      V_reading = .FuncRdg(apbChA, "V")
   End With
   a$= "Ch A Level Reading _
      "+Left(Str$(L_reading),6)+"dBr 2"
   b$= "Ch A Freq Reading _
      "+Left(Str$(F_reading),6) +"%Hz"
   c$= "Function Meter Reading _
      "+Left(Str$(A_reading),6)+"dBr 1"
   d$= "Function Meter Reading _
      "+Left(Str$(V_reading),6)+"V/FS"
   ATS.Prompt.Text = a$ & vbCr & b$ & vbCr & c$ _
      & vbCr & d$
   ATS.Prompt.ShowWithContinue
   Beep
   Stop
End Sub
```

ATS2.Inst.RefdBrAuto — Method

Syntax **ATS2.Inst.RefdBrAuto**

Result Boolean

True	dBr reference set.
False	dBr reference NOT set.

Description This command sets the Analyzer dBr Reference field(s).

The following logic is used to determine which meter reading is written into which reference field:

If the Function meter units selected on the Audio Analyzer panel are not either dBrA or dBrB, then the Channel A Level meter reading is written into the dBrA Reference field and the Channel B Level meter reading is written into the dBrB Reference field.

If the Function meter units are either dBrA or dBrB and the corresponding Level meter is not set to a dBr unit, the Function meter measurement is written into the corresponding dBr Reference field and the other dBr Reference field takes its value from the Level meter on the corresponding channel.

Example

```
Sub Main
  ATS.Application.NewTest
  ATS2.AGen.OutputOn = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS2.AnalogIn.Source(apbChB) = apbAnalogInGenMon
  ATS.Sweep.Data(1).Top("dBr A") = 5.000000e-002
  ATS.Sweep.Data(1).Bottom("dBr A") = -5.000000e-002
  ATS.Sweep.Data(2).Id = 6342
  ATS.Sweep.Data(2).Top("dBr B") = 5.000000e-002
  ATS.Sweep.Data(2).Bottom("dBr B") = -5.000000e-002
  ATS2.Inst.RefdBrAuto
  Return = ATS2.Inst.RefdBrAuto
  If Return = True Then Debug.Print "Reference Set"
  ATS.Sweep.Start
End Sub
```

Output

```
Reference Set
```

ATS2.Inst.RefFreq — Property

Syntax **ATS2.Inst.RefFreq(**ByVal *Unit* As String**)**

Data Type Double

Parameter

Name	Description
Unit	String that designates the desired unit. The following units are valid for this command: Hz

Description This command sets the Frequency value for the relative frequency units (octaves, decades, %Hz, etc) of the Analyzer Frequency counter.

Example See example for `ATS2.Inst.RefdBr`.

ATS2.Inst.RefFreqAuto

Method

Syntax **ATS2.Inst.RefFreqAuto**

Result Boolean

Description This command sets the Analyzer dBr Reference field(s).

The following logic is used to determine which meter reading is written into the reference field:

The following logic is used to determine which meter reading is written into which reference field for System Two: If the Function meter units selected on the Analog Analyzer panel are not either dBrA or dBrB, then the Channel A Level meter reading is written into the dBrA Reference field and the Channel B Level meter reading is written into the dBrB Reference field.

If the Function meter units are either dBrA or dBrB and the corresponding Level meter is not set to a dBr unit, the Function meter measurement is written into the corresponding dBr Reference field and the other dBr Reference field takes its value from the Level meter on the corresponding channel.

Example

```
Sub Main
  ATS.Application.NewTest
  ATS2.AGen.OutputOn = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS2.AnalogIn.Source(apbChB) = apbAnalogInGenMon
  ATS.Sweep.Data(1).Top("dBr A") = 5.000000e-002
  ATS.Sweep.Data(1).Bottom("dBr A") = -5.000000e-002
  ATS.Sweep.Data(2).Id = 6342
  ATS.Sweep.Data(2).Top("dBr B") = 5.000000e-002
  ATS.Sweep.Data(2).Bottom("dBr B") = -5.000000e-002
  ATS2.Inst.RefdBrAuto
  Return = ATS2.Inst.RefdBrAuto
  If Return = True Then Debug.Print "Reference Set"
  ATS.Sweep.Start
End Sub
```

ATS2.Inst.RefVFS

Property

Syntax `ATS2.Inst.RefVFS(ByVal Unit As String)`

Data Type Double

Parameter

Name	Description
Unit	String that designates the desired unit. The following units are valid for this command: V

Description This command sets the V/FS value is the analog-to-digital scaling value. When testing an external Analog to Digital converter (A/D), the value of analog input voltage which produces digital full scale output may be typed into this field. The Level Monitor or Reading meter units may then be selected as V, Vp, Vpp, dBu, dBV, dBr A, or dBr B to express the measured digital amplitude in terms of the analog input value to the converter.

Example See example for `ATS2.Inst.RefCh1dBr`.

ATS2.Inst.RefWatts

Property

Syntax `ATS2.Inst.RefWatts(ByVal Unit As String)`

Data Type Double Set Watts reference Impedance value.

Parameter

Name	Description
Unit	The following units are available: Ohms only.

Description This command sets the value of Analog Analyzer Watts reference impedance. The known external load impedance should be entered, from which the software computes power from the measured voltage and the equation V^2 / R where R is the reference impedance.

Example

```
Sub Main
  ATS.Application.NewTest
  ATS2.AGen.Config = apbAGenUnBal
  ATS2.AGen.RefWatts("Ohms") = 8
  ATS2.AGen.Ampl(apbChA, "W") = .001
  ATS2.AGen.OutputOn = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
```

```
   ATS2.Inst.RefWatts("Ohms") = 8
   ATS2.Inst.Analyzer.FuncSettling(apbChA, 1, _
      .000002, "V", 4, .05, apbExponential)
   ATS2.Inst.Analyzer.FuncTrig(apbChA)
   Do
      Ready = ATS2.Inst.Analyzer.FuncReady(apbChA)
   Loop Until Ready > 0
   Reading1 = ATS2.Inst.Analyzer.FuncRdg(apbChA, "W")
   Debug.Print "Output Power = " & _
      Format(Reading1, "#.0000");" Watts"
   ATS2.AGen.OutputOn = False
End Sub
```

ATS2.Inst.Selection — Property

Syntax **ATS2.Inst.Selection**

Data Type Constant

apbInstAudioAnalyzer

Audio Analyzer : usable for analog or digital domain input signals. Measures frequency, level, and one of a number of more sophisticated parameters (amplitude, 2-channel ratio, crosstalk, THD+N, selective amplitude, IMD, and phase) on both stereo channels simultaneously.

apbInstFFTAnalyzer

FFT Spectrum Analyzer : usable for analog or digital domain input signals. Provides general-purpose time domain (oscilloscope) display of waveforms or frequency domain (spectrum analyzer) display of signals, including the received jitter signal. Features include double precision transforms for better than 140 dB dynamic range, pre-trigger, a variety of selectable transform lengths up through 32k, acquisition memory up to 256k, the ability to position the start of the transformed section anywhere in the acquired record, both synchronous (time domain) and FFT spectrum (power-law) averaging, eight windowing functions, a frequency correction technique which adjusts single

sinewave signals to bin center so that no window is necessary, and several types of waveform processing for display.

apbInstIntervuAnalyzer

INTERVU Digital Interface Analyzer : analyzes the AES/EBU or consumer digital interface input signal of digital interface models via a 80 MHz sample rate A/D converter. Displays eye patterns, waveform display or spectrum analysis of the digital interface signal, waveform display or spectrum analysis of the recovered jitter signal, triggers on interface errors or on selected sections of the signal including received or transmitted preambles or received channel status blocks, measures jitter of the entire signal or selected sections such as preambles, and performs statistical analysis and histogram display of parameters including amplitude, pulse width, and jitter.

apbInstFastTestAnalyzer

FASTTEST Multitone Audio Analyzer : usable for analog or digital domain input signals. Provides time or frequency domain views of the signal. With multitone test signals, performs post-FFT processing to measure frequency response, total distortion and noise, noise in the presence of test signal, crosstalk, and generates psychoacoustic masking curves. Trigger modes include external and free-running, or triggering only upon receipt of the specific multitone signal matching the reference signal presently loaded into the digital generator. Variable trigger delay may be set to allow audio processors to settle. Frequency error correction compensates for multitone signals coming from other Audio Precision test instruments, played back from digital reproducers with different clock rates, or recorded and reproduced from analog recorders with speed errors up to 3%. FASTTEST also tests low-bit-rate perceptual coders with multitone signals by summing quantization noise and distortion in critical bands and comparing the results to an embedded psychoacoustic model of the frequency masking effect in humans.

apbInstHarmonicAnalyzer

Harmonic Distortion Analyzer : usable for analog or digital domain input signals. Permits flexible, highly selective measurement of the amplitude of user-specified harmonic orders. The user may choose to measure any individual harmonic through the 15th, or the sum of any arbitrary selection of harmonic distortion products from 2nd through 15th. Harmonic Distortion Analyzer may be used with either analog or digital domain signals. It is a two-channel program with four measurement meters per channel: a selective amplitude meter for the fundamental component of the signal, a frequency counter for the fundamental component, and two identical distortion product summing meters.Each of these distortion summing meters can be set to include any desired combination of harmonic distortion products (through the 15th) as long as each product is within the bandwidth limitations determined by the sample rate. Harmonic Distortion Analyzer can thus measure THD (Total Harmonic Distortion) without noise for any specified set of harmonic products. This analyzer effectively operates as a real-time program, even though it is internally based on FFT technology.

Both channels of Harmonic Distortion Analyzer may be set to measure one signal, such as a single-channel signal or one channel of a stereo signal. This configuration provides four Distortion summing meters. Each meter sends data to a different trace on the graph. This permits, for example, simultaneously plotting the fundamental signal amplitude and the 2nd, 3rd, 4th, and 5th harmonic amplitudes as five graph traces during a single frequency sweep.

Description This command selects the ATS Analyzer Instrument type.

Example

```
Sub Main
  ATS.Application.NewTest
  ATS2.AGen.OutputOn = True
  ATS.Application.PanelClose(apbAnalogGen)
  ATS.Application.PanelClose(apbAnalyzer)
```

```
  ATS2.Inst.Selection = apbInstFFTAnalyzer
  ATS2.Inst.FFT.InputFormat = apbFFTAnalog
  ATS2.Inst.FFT.TransformLength = apbFFT32k
  ATS2.Inst.Anlr.AcquireLength = apbFFTTrack
  ATS2.Inst.FFT.Window = apbFFTNoneMoveToBinCenter
  ATS.Sweep.Source(1).Id = 5515
  ATS.Sweep.Source(1).Start("Hz") = 100000
  ATS.Sweep.Data(1).Id = 6024
  ATS.Sweep.Data(1).Top("dBV") = 26.020600
  ATS.Sweep.Start
  ATS.Graph.OptimizeLeft
End Sub
```

Chapter 32

Speaker

ATS2.Speaker.Mute — Property

Syntax **ATS2.Speaker.Mute**

Data Type Boolean

True	Output Muted
False	Output On

Description This command sets the speaker output to ON or Muted.

Example

```
Sub Main
  ATS.Application.NewTest
  ATS2.AGen.Wfm.Sine.Stereo
  ATS2.AGen.ChBTrackA = False
  ATS2.AGen.Freq(apbChB,"Hz") = 2000.0
  ATS2.AGen.OutputOn = True
  ATS2.AnalogIn.Source(apbChA) = apbAnalogInGenMon
  ATS2.AnalogIn.Source(apbChB) = apbAnalogInGenMon

  ATS.Application.PanelOpen(apbSpeaker)

  ATS2.Speaker.Volume = 100
  ATS2.Speaker.Source = apbSpeakerChA
  ATS2.Speaker.Mute = False
  Wait 2
  ATS2.Speaker.Source = apbSpeakerChB
  Wait 2
  ATS2.Speaker.Mute = True
End Sub
```

ATS2.Speaker.Source

Property

Syntax `ATS2.Speaker.Source`

Data Type Constant

apbSpeakerChA
: Channel A

apbSpeakerChB
: Channel B

apbSpeakerFuncA
: Function A

apbSpeakerFuncB
: Function B

apbSpeakerChAChB
: Channel A and Channel B (Sum)

apbSpeakerFuncAFuncB
: Function A and Function B (Sum)

apbSpeakerChAFuncA
: Channel A and Function A (Sum)

apbSpeakerChBFuncB
: Channel B and Function B (Sum)

Description This command selects the monitoring location(s) for the speaker and the headphone jack outputs.

See Also `ATS2.Speaker.Mode`

Example See example for `ATS2.Speaker.Mute`.

ATS2.Speaker.Volume

Property

Syntax `ATS2.Speaker.Volume`

Data Type Integer

Description This command selects the speaker volume and the headphone jack output signal level.

Example See example for `ATS2.Speaker.Mute`.

User Notes

Chapter 33

Switcher

ATS2.SWR.In — Property

Syntax `ATS2.SWR.In(ByVal Channel As Constant)`

Data Type Long 0 - 192

Parameter

Name	Description
Channel	apbSwrChA = Select channel A apbSwrChB = Select channel B apbSwrChAB = Select Channel A and Channel B

Description This command sets the channel connections of the Input switchers. Channel numbers 1 to 192 are available, where 0 means all channels off. Any other number results in no action taken.

See Also `ATS2.SWR.Offset`

Example See example for `ATS2.SWR.Mode`.

ATS2.SWR.InOut — Property

Syntax `ATS2.SWR.InOut(ByVal Channel As Constant)`

Data Type Long 0 - 192

Parameter

Name	Description
Channel	apbSwrChA = Select channel A apbSwrChB = Select channel B apbSwrChAB = Select Channel A and Channel B

Description This command sets the channel connections of the Input and Output switchers. Channel numbers 1 to 192 are available, where 0 means all channels off. Any other number results in no action taken.

See Also `ATS2.SWR.Offset`

Example See example for `ATS2.SWR.Mode`.

ATS2.SWR.Mode — Property

Syntax **`ATS2.SWR.Mode`**

Data Type Constant

`apbSwrBIndependentA`

B independent from A: when selected, channels A and B may be independently set to any channel number within their range. This is the normal mode for most operation.

`apbSwrBDriveAll`

B = All outputs driven, A = off: when selected, the switcher B common input is connected to all 12 outputs on each Output switcher module and the A common input is disconnected. Both the A and B output fields will be gray and unavailable for settings in this mode since all connections are defined by the mode itself. This mode enables connection of a single generator signal to all device inputs, which may be a requirement of a burn-in rack or a life test.

`apbSwrBDriveAllExceptA`

B = All outputs driven except # selected for A: when selected, the A common input connects to the channel number entered in the A output field and the B common input connects to the remaining 11 channels on that switcher and to all 12 channels of all other Output switchers connected. The purpose of this mode is for worst-case crosstalk measurements, so that all except one channels of a multi-track or multi-channel recorder or mixing console are driven while the output signal from the one un-driven channel is measured. This mode is normally used with a nested sweep with Source 2 on the Sweep panel set to scan channel A input and output through all possible device channels while Source 1 is commonly set for a frequency

sweep to measure selective crosstalk across the audio spectrum.

Description This command sets the switcher output configuration

Example

```
Sub Main
   Dim switch As Integer, msg As String
   ATS2.AGen.Ampl(apbChA, "V") = 1.0
   ATS2.AGen.OutputOn = True
   ATS2.Swr.Mode = apbSwrBIndependentA
   ATS2.Swr.Offset(apbOffsetOutput) = 1
   ATS2.Swr.Offset(apbOffsetChB) = 2
   For Switch = 1 To 6
      ATS2.Swr.In(apbSwrChA) = Switch
      'ATS2.Swr.In(apbSwrChB) = Switch
      'ATS2.Swr.In(apbSwrChAB) = Switch
      'ATS2.Swr.Out(apbSwrChA) = Switch
      'ATS2.Swr.Out(apbSwrChB) = Switch
      'ATS2.Swr.Out(apbSwrChAB) = Switch
      'ATS2.Swr.InOut(apbSwrChA) = Switch
      'ATS2.Swr.InOut(apbSwrChB) = Switch
      'ATS2.Swr.InOut(apbSwrChAB) = Switch
      ATS2.Inst.Analyzer.LevelTrig(apbChA)
      While ATS2.Inst.Analyzer.LevelReady(apbChA) = 0
      Wend
      rdg = ATS2.Inst.Analyzer.LevelRdg(apbChA, "V")
      If rdg > 0.5 * signal Then
         msg = msg & "Ch A In " & Switch & _
         "<-> Ch A Out " & Switch + _
          ATS2.Swr.Offset(apbOffsetOutput) & Chr(13)
      End If
   Next Switch
   ATS.Prompt.FontSize = 10
   ATS.Prompt.Text = msg
   ATS.Prompt.ShowWithContinue
   Stop
End Sub
```

ATS2.SWR.Offset

Property

Syntax `ATS2.SWR.Offset(ByVal Type As Constant)`

Data Type Long 0 - 192

Parameter

Name	Description
Type	apbOffsetOutput = Output offset relative to input of channel A or channel B. apbOffsetChB = Channel B offset relative to channel A.

Description This command determines the channel number difference between the input and output switcher channels and the channel A and channel B switchers.

See Also `ATS2.SWR.InOut`

Example See example for `ATS2.SWR.Mode`.

ATS2.SWR.Out

Property

Syntax `ATS.SWR2.Out(ByVal Channel As Constant)`

Data Type Long 0 - 192

Parameter

Name	Description
Channel	apbSwrChA = Select channel A apbSwrChB = Select channel B apbSwrChAB = Select Channel A and Channel B

Description This command sets the channel connections of the Output switchers. Channel numbers 1 to 192 are available, where 0 means all channels off. Any other number results in no action taken.

See Also `ATS2.SWR.Offset`

Example See example for `ATS2.SWR.Mode`.

Chapter 34

Sync/Ref Input

ATS2.Sync.FrameLock — Property

Syntax `ATS2.Sync.FrameLock`

Data Type Boolean

True	Enable
False	Disable

Description This command syncronizes the output AES/EBU frame (status bits preambles) to the AES/EBU Ref Input frame (status bits preambles).

The Digital Output Sample Rate (OSR) command `ATS2.Dio.OutRate` and Sync Reference Frequency command `ATS2.Sync.Freq` must be set identical for this control to operate correctly.

See Also `ATS2.Sync.OutRate`

ATS2.Sync.Freq — Property

Syntax `ATS2.Sync.Freq(ByVal Unit As String)`

Data Type Double — 8kHz - 54kHz

Parameter

Name	Description
Unit	String that designates the desired unit. The following unit is valid for this command: Hz

Description This command specifies the exact Sync Input rate to be assumed by the phase-locked loop which locks the internal crystal oscillator to the reference. The Internal Sample Rate is then derived from the internal crystal oscillator. Normally, the user will enter the known reference

frequency. If the value entered differs by small amounts (less than 15 ppm) from the actual Reference frequency, all ATS sample rates will be shifted by the percentage error. If the value entered differs by more than +/-15 ppm from the actual Reference signal frequency, the internal crystal oscillator will not lock to the reference. When either of the two video sync functions (NTSC or PAL/SECAM) is selected, the normal horizontal sync rate for the selected video standard is automatically typed into the Frequency field.

See Also `ATS2.Sync.`

Example

```
Sub Main
   ATS2.Sync.Source = apbSyncNTSCHorzRate
   ATS2.Sync.Impedance = apbSync75ohm
   ATS2.Sync.Source = False
   rdg = ATS2.Sync.Freq("Hz")
   If (rdg < lower_limit) Or (rdg > upper limit) Then
      'input sync freq not close enough, flag an _
         error and ...
      End
   Else
      If ATS2.Sync.OutRangeRdg Then
         'internal clock not sync'ed, flag an _
            error and ...
         End
      Else
         ATS2.Sync.Source = True
         'now perform further testing on DUT...
      End If
   End If
End Sub
```

ATS2.Sync.FreqRdg — Property

Syntax **`ATS2.Sync.FreqRdg(`**`ByVal` *`Unit`* `As String`**`)`**

Data Type Double

Parameter

Name	Description
`Unit`	The following units are available, Hz.

Description This command returns a unsettled reading for the Sync Delay Input Frequency for the signal selected in the Sync Source field when the ON/OFF button is OFF. This is intended as a verification of a proper sync input connection. The Reference frequency value is usually known to a greater accuracy than it can be measured by ATS (whose accuracy is typically about 1 ppm), in which case the known value should be entered in the Sync Input Frequency entry field. For example, a measured and displayed value of 47.9998 kHz almost certainly indicates an actual 48 kHz reference frequency, and 48.0000 kHz is the value which should be entered in the Input Frequency entry field. When the ON/OFF button is turned ON, the display field is blanked since the reading will be identical to the value in the Frequency Entry field.

See Also `ATS2.Sync.FreqReady, ATS2.Sync.FreqTrig`

Example

```
Sub Main
   ATS2.Sync.Source = False
   ATS2.Sync.FreqTrig
   While ATS2.Sync.FreqReady = False
      'Do other tasks while waiting for reading ...
   Wend
   reading1 = ATS2.Sync.FreqRdg("Hz")
   Debug.Print "Sync Input Frequency = " & _
      Format(Reading1, "#.0000") & " Hz"
End Sub
```

Output

```
Sync Input Frequency = 48000.0017 Hz
```

ATS2.Sync.FreqReady — Property

Syntax **`ATS2.Sync.FreqReady`**

Data Type Integer

0	Reading not ready.
>0	Reading ready.

Description This command returns the Sync Frequency unsettled reading ready count.

Because readings do not return until a reading is ready, this command may be used to avoid waiting for a reading. This command does NOT zero the ready count and so may be called any number of times. Only a call to the `ATS2.Sync.FreqRdg` command will zero the ready count.

If the reading is found to be ready, a call to the `ATS2.Sync.FreqRdg` command will be guaranteed to return quickly.

Note that readings free run at the selected measurement rate and eventually become ready without a call to the `ATS2.Sync.FreqTrig` command.

See Also `ATS2.Sync.FreqRdg, ATS2.Sync.FreqTrig`

Example See example for `ATS2.Sync.FreqRdg`.

ATS2.Sync.FreqTrig — Method

Syntax **`ATS2.Sync.FreqTrig`**

Description Causes a restart of the reading cycle and zeros the ready count for the `ATS2.Sync.FreqRdg` command. The reading in progress is aborted.

See Also `ATS2.Sync.FreqRdg, ATS2.Sync.FreqReady`

Example See example for `ATS2.Sync.FreqRdg`.

ATS2.Sync.Impedance — Property

Syntax **`ATS2.Sync.Impedance`**

Data Type Constant

`apbSyncHiZ`
Hi Impedance

`apbSync75ohm`
75 Ohms

Description This command controls the input impedance for the Un-Balanced Sync Input.

See Also `ATS2.Sync.Source`

Example See example for `ATS2.Sync.Freq`.

ATS2.Sync.OutOfRangeRdg Property

Syntax **`ATS2.Sync.OutOfRangeRdg`**

Result Boolean

`True`	In Range
`False`	Out Of Range

Description This command returns a unsettled reading for the Sync Out Of Range indicator.

Example See example for `ATS2.Sync.Freq`.

ATS2.Sync.Source Property

Syntax **`ATS2.Sync.Source`**

Data Type Boolean

`True`	Enable.
`False`	Disable.

Description This command enables or disables the external sync input.

See Also `ATS2.Sync.SourceInput`

Example See example for `ATS2.Sync.FreqRdg`.

ATS2.Sync.SourceInput Property

Syntax **`ATS2.Sync.SourceInput`**

Data Type Constant

apbSyncAESSyncRate
AES Sync Rate:

apbSyncSquarewave
Squarewave:

apbSyncNTSCHorzRate
NTSC Video Sync Horz Rate:

apbSyncPALHorzRate
PAL / SECAM Video Sync Horz Rate:

Description This command sets the input type for the external sync input.

See Also `ATS2.Sync.Source`

Example See example for `ATS2.Sync.Freq`.

Chapter 35

Main Triggers

ATS2.Trigger.Coding — Property

Syntax `ATS2.Trigger.Coding`

Data Type Boolean

True	Enable Data Acqusition trigger generation on a Coding error.
False	Disable Data Acqusition trigger generation on a Coding error.

Description This command enables or disables generation of a Data Acquisition trigger for a Coding Error.

Coding indicates a deviation from proper biphase coding in the input serial stream (ignoring preambles). Proper biphase signals can never remain at a logic high or logic low level for more than two consecutive Unit Intervals (UI) except in the preamble. The preamble deliberately deviates from biphase coding in order to provide a unique frame synchronization signal, so preambles are excluded from the function of the Coding indicators.

Example See example for `ATS2.Trigger.Parity`.

ATS2.Trigger.Confidence — Property

Syntax `ATS2.Trigger.Confidence`

Data Type Boolean

True	Enable Data Acqusition trigger generation on a Confidence error.
False	Disable Data Acqusition trigger generation on a Confidence error.

Description This command enables or disables generation of a Data Acquisition trigger for a Confidence Error.

The Confidence error occurs when the ratio between the amplitude of the three UI long pulse and the following one UI-long pulse in a preamble becomes large enough to cause an increasing probability of errors when slicing the received signal into logic high and low values. This large ratio occurs when the transmission bandwidth has been reduced to marginal or unacceptable values. Under these conditions, selection of hardware input equalization (XLR with EQ or BNC with EQ rather than XLR or BNC selections of the Input Format field) will often compensate for the cable bandwidth reduction, and provide reliable measurements.

Example See example for `ATS2.Trigger.Parity`.

ATS2.Trigger.Lock — Property

Syntax **`ATS2.Trigger.Lock`**

Data Type Boolean

True	Enable Data Acqusition trigger generation on a Lock error.
False	Disable Data Acqusition trigger generation on a Lock error.

Description This command enables or disables generation of a Data Acquisition trigger for a Lock Error.

The Lock error occurs when the digital input phase-locked loop is unable to lock to the incoming signal.

Example See example for `ATS2.Trigger.Parity`.

ATS2.Trigger.Parity — Property

Syntax **`ATS2.Trigger.Parity`**

Data Type Boolean

True	Enable Data Acqusition trigger generation on a Parity error.
False	Disable Data Acqusition trigger generation on a Parity error.

Description This command enables or disables generation of a Data Acquisition trigger for a Parity Error.

The Parity error indicates a parity error in either subframe. Correct parity is determined by comparing the P (parity) bit with the sum of the remaining 31 bits in each subframe. Any single bit error or odd number of bit errors introduced in transmission within a subframe will cause a Parity error indication, but even numbers of bit errors cannot be detected by this technique.

Example

```
Sub Main
  ATS.Application.NewTest
  ATS.Application.PanelClose(apbAnalogGen)
  ATS2.Inst.Selection = apbInstIntervuAnalyzer
  ATS2.Trigger.Source = apbTrigRcvError
  ATS2.Inst.Intervu.TrigPolarity = apbPos
  ATS2.Inst.Intervu.AcquisitionPosition = _
     apbIntervuPreTrig
  ATS2.Trigger.Confidence = False
  ATS2.Trigger.Coding = False
  ATS2.Trigger.Lock = False
  ATS2.Trigger.Parity = True

  ATS2.Dio.InFormat = apbDioInGenMon
  ATS.Sweep.Data(1).Id = 6053
  ATS.Sweep.Source(1).Id = 5612
  ATS.Sweep.Source(1).Start("sec") = -5.0e-006
  ATS.Sweep.Source(1).Stop("sec") = 5.0e-006

  ATS.Application.SetWatchDogTimer1(5.0,False)
  ATS.Sweep.StartNoWait
  ATS.Graph.Comment = "Wait for Parity Error to
occur."

' The Sweep will proceed automatically when the
'    Parity Error occurs.

  Do
  Loop While ATS2.Dio.FlagParityRdg = False
'Wait here for Parity Error to be detected on the _
  Digital Input/Output panel.
```

```
   ATS.Graph.Comment = "Parity Error detected and _
      waveform display updated."
   ATS.Graph.OptimizeLeft

End Sub
Sub ATSEvent_OnWatchDogTimeout(ByVal Id As Long)
   If Id = 1 Then
      ATS2.Dio.OutParityError = True
   End If
End Sub
```

ATS2.Trigger.Source — Property

Syntax `ATS2.Trigger.Source`

Data Type Integer

0	Ch. A Receive Preamble: cause signal to be acquired at the first Channel A (left) Preamble which occurs after Go is clicked or the F9 function key is pressed. The Channel A Preamble is known as the X Preamble in the AES/EBU standard and the M Preamble in the Consumer standard. The first information acquired will be the last four Unit Intervals of the selected preamble, followed by the LSB of the audio signal if full 24-bit resolution audio is transmitted, or the beginning of the 4-bit Auxiliary data if audio is restricted to 20 bits or less.
1	Ch. A Transmit Preamble: cause signal to be acquired beginning at the start of the first Channel A Preamble which is transmitted from System Two after the `ATS.Sweep.Start` command is executed. The first information acquired includes the entire preamble, followed by audio or Auxiliary data. This triggering selection permits measurement of time delay through a digital device or system under test.
2	Ch. B Receive Preamble: cause signal to be acquired at the first Channel B (right) Preamble which occurs after Go is clicked or the F9 function key is pressed. The Channel B

Preamble is known as the Y Preamble (AES/EBU) or W Preamble (consumer). The first information acquired will be the last four Unit Intervals of the selected preamble, followed by the LSB of the audio signal if full 24-bit resolution audio is transmitted, or the beginning of the 4-bit Auxiliary data if audio is restricted to 20 bits or less.

3 Ch. B Transmit Preamble: cause signal to be acquired beginning at the start of the first Channel B Preamble which is transmitted from System Two after `ATS.Sweep.Start` command is executed. The first information acquired includes the entire preamble, followed by audio or Auxiliary data. This triggering selection permits measurement of time delay through a digital device or system under test.

4 Receive Error: selection is a pre-trigger, causing the 256k samples (about 3.9 milliseconds) immediately preceding an interface Error Flag to be retained (approximately 39 microseconds of signal following the occurrence of the error will also be retained. The interface Error Flags are generated by the AES/EBU receiver chip of the DIO, and their status is indicated by the Parity, Coding, Lock, or Confidence indicators at the right of the DIO panel. If this acquisition trigger selection is in use and a Parity error, Coding error, Lock error, or Confidence error occurs, the last (approximately) 3.9 milliseconds of interface signal preceding the error will be retained in the INTERVU buffer for examination via waveform display, spectrum analysis, or probability histograms. The Invalid indicator is not considered an interface error and thus will not result in an acquisition into INTERVU.

5 Receive Block: causes signal to be acquired beginning at the end of the first Channel Status Block Preamble received after Go is clicked or the F9 function key is pressed. This is known as the Z Preamble in the AES/EBU standard and the B Preamble in the Consumer standard. The first information displayed will be the last four UIs of the Z preamble, followed by the LSB of the Channel A audio signal if full 24-bit resolution audio is transmitted, or the beginning of the 4-bit Auxiliary data if audio is restricted to 20 bits or less, of

	the frame which marks the beginning of a new Channel Status Block. Channel Status Blocks are 192 frames long, with the C (Channel Status) bit of each of these 192 frames being assembled into the 24 Channel Status Bytes defined in the AES/EBU and Consumer standards.
6	Jitter Generator: causes a trigger at every zero crossing of the sinewave, squarewave, or noise signal generated by the DIO jitter generator. This selection provides a stable display of the received jitter waveform when measuring jitter gain or loss through a digital device.
7	External:
8	Common Mode Signal:
9	Interfering Noise:
10	Digital Generator:
11	Transmit Block:
12	Ch.A Sync Preamble:
13	Ch.B Sync Preamble:
14	Sync Error:
15	Sync Block:
16	Input ZeroCrossing:

Description This command defines the trigger source that is used to trigger an acqusition.

Example See example for `ATS2.Inst.Intervu.WfmDisplay`.

ATS2.Trigger.Source Property

Syntax **`ATS2.Trigger.Source`**

Data Type Constant

apbTrigAgen	Analog Generator
apbTrigDgen	Digital Generator

apbTrigJitGen
: Jitter Generator

apbTrigExt
: External Trigger In

apbTrigLine
: Line (AC Mains)

apbTrigRcvChAPreamJit
: ChA Rec Sub-Frame

apbTrigRcvChBPreamJit
: ChB Rec Sub-Frame

apbTrigRcvChAPreamDeJit
: ChA Rec Sub-Frame DeJitt

apbTrigRcvChBPreamDeJit
: ChB Rec Sub-Frame DeJitt

apbTrigRcvBlock
: Rec Block (192 frames)

apbTrigRcvError
: Rec Error

apbTrigXmitChAPreamJit
: ChA Xmit Sub-Frame

apbTrigXmitChBPreamJit
: ChB Xmit Sub-Frame

apbTrigXmitChAPreamDeJit
: ChA Xmit Sub-Frame DeJitt

apbTrigXmitChBPreamDeJit
: ChV Xmit Sub-Frame DeJitt

apbTrigXmitBlock
: Xmit Block (192 frames)

apbTrigSyncChAPream
: ChA Sync/Ref Rec Sub-Frame

apbTrigSyncChBPream
: ChB Sync/Ref Rec Sub-Frame

apbTrigSyncBlock

Sync/Ref Rec Block (192 frames)

apbTrigSyncError

Sync/Ref Error

Description This command defines the trigger source that is used to trigger an acqusition.

Example See example for `ATS2.Inst.Intervu.WfmDisplay`.

Appendix A
Settling Algorithm

Description

The general concept of the Sweep Settling Exponential and Flat algorithms is to discard all meter readings during the Delay interval, then to compare the number of successive readings equal to the Points value against the Tolerance or Floor values. Only when the specified (Points) number of consecutive readings agree with one another within the specified Tolerance or Floor values will the data be considered settled. It is then accepted for plotting and the Sweep Source parameter permitted to proceed to the next step.

Settling Parameter Descriptions

Name	Description
Channel	This parameter is not used by all settling commands. Review the Settling command syntax to determine if this parameter is required. apbChA = Select channel A apbChB = Select channel B
FloorUnit	String that designates the desired unit to be used with the Floor# Parameter. Refer to the reading to determine the appropriate unit selections.
Tolerance	The Tolerance value which should be entered is the amount of variability the user is willing to accept from test to test. A Tolerance value of 0.1% (about 0.01 dB) or even slightly smaller may be appropriate when making frequency response measurements on the test system itself or on an

external device known to be very flat and being measured under excellent signal-to-noise conditions. At the other extreme, Tolerance values of 10% to 25% (1 to 2 dB) may be required to obtain data under noisy conditions, or when making measurements with a random noise signal as the stimulus. The default value of 1% (about 0.1 dB) is a good starting compromise for most level measurements.

Floor The Floor value is used by the algorithms instead of the Tolerance value whenever the Floor value is larger. When the measurements values are greater than a few percent of full scale on the instrument range in use, the Tolerance value is normally the determining parameter. If the measurements are very near the bottom of the instruments dynamic range, use of only a Tolerance parameter could result in a hang up situation, since the percentage difference between two adjacent values (quantization levels) at the bottom of a meters range is large. The Floor parameter thus serves as a safety valve, avoiding slowing or hang ups in the highly resolution-limited situations where the signal is near the bottom of a measurable range. The default values of Floor for each meter are chosen to be approximately the resolution of that meter on its most sensitive range. Since resolution varies with reading rate (slower reading rates give more resolution), it may be appropriate to change the default values when reading rate is fixed at a given value.

FloorUnit String that designates the desired unit to be used with the Floor# Parameter. Refer to the reading to determine the appropriate unit selections.

Points The value determines how many consecutive readings are examined by the Settling Algorithm to qualify a measurement to be returned for display.

Delay The value determines how long ATS software waits at each new step of a sweep before starting to examine

measurements from the instrument. The Delay value is effective even when the Algorithm selection is None. The Delay time will be taken at the beginning of each nest of a nested sweep, including nested FFT measurements with the FFT at Source 1 and another parameter such as generator amplitude at Source 2. Acquistion of signal into any of the FFT programs will not begin until the Delay value (or 200 milliseconds, whichever is greater) has passed. For Time sweeps where it is desired to make as many measurements per second as possible, the Delay value should be set to zero in addition to selecting None for settling.

Algorithm

apbNone = None: no settling process takes place for that meter. However, the Delay value (see the Delay topic) is still implemented before each point is plotted even with None selected as the settling algorithm. Measurements such as wow and flutter, phase jitter, and (with ATS Dual Domain) interface signal jitter are examples of cases where no settling should be used, since it is normally desired to see the extreme variations in measurements.

apbExponential = Exponential: the newest reading (N) must agree with the immediately preceding reading (N-1) within the Tolerance value, with the reading before (N-2) that within twice the Tolerance value, with the reading before that (N-3) within four times the Tolerance value, etc. Exponential is the recommended settling algorithm for most audio applications, since typical device transients tend to die away in an exponential fashion. Exponential thus will usually provide repeatable results to the Tolerance acceptable to the user in the minimum length of time.

apbFlat = Flat: the percentage difference between each set of two consecutive readings (N vs N-1, N-1 vs N-2, etc.) must be equal to or less than the specified Tolerance value, through the number of readings specified as the Points value. Illustrating the Flat algorithm for 1% Tolerance would

result in an envelope bounded by two horizontal lines at the plus and minus 1% levels across the full number of Points. The Flat algorithm thus guarantees that the transients have been settled to the specified Tolerance for some time, which tends to take longer than the Exponential algorithm.

apbAverage = Average: measurements are first discarded for the duration of the Delay interval, as with Exponential and Flat. At the conclusion of the Delay period, the number of consecutive readings specified in the Points field is accumulated and their average value computed and plotted. Tolerance and Floor values are ignored when Average is selected. The Average algorithm is particularly useful when the signal is fundamentally noisy and might never settle within a practical Tolerance.

Appendix B

Parameter ID# List

Using an ID# as the setting (*idnumber*) for the sweep Data 1-6, Source 1-2, and source 1 Min Level Source Selector (External Sweeps) commands is analogous to the selecting the Sweep panel Data 1 browser and choosing the desired instrument and parameter.

Example: To obtain the ID# in order to programmatically assigned a sweep parameter. Manually select the desired instrument and parameter from the desired sweep browser and note the text displayed in the selection box. Locate the text displayed in the selection box from the following list and use the associated value with the appropriate `ATS.Sweep.????.Id` command designating the desired sweep parameter to be changed.

Sweep panel ID Text	Value
Analog Generator.Burst Inteerval	5069
Analog Generator.Burst Low Level	5070
Analog Generator.Burst On	5068
Analog Generator.ChA Amplitude	5052
Analog Generator.ChB Amplitude	5053
Analog Generator.Dual Amp Ratio	5085
Analog Generator.Frequency	5051
Analog Generator.Frequency 2	5084
Analog Generator.High Freq	5087
Analog Generator.IM Freq	5054
Analog Generator.Phase	5083
Analyzer.Amplitude A	6343
Analyzer.Amplitude B	6372
Analyzer.Bandpass A	6345
Analyzer.Bandpass B	6374
Analyzer.BP/BR Filter Freq	5542
Analyzer.Crosstalk A	6016
Analyzer.Crosstalk B	6069

Analyzer.Frequency A	6009
Analyzer.Frequency B	6010
Analyzer.Level A	6341
Analyzer.Level B	6342
Analyzer.Phase	6365
Analyzer.Ratio A	6015
Analyzer.Ratio B	6068
Analyzer.SMPTE/DIN A	6363
Analyzer.SMPTE/DIN B	6378
Analyzer.THD+N Ampl A	6344
Analyzer.THD+N Ampl B	6373
Analyzer.THD+N Ratio A	6017
Analyzer.THD+N Ratio B	6070
Auxiliary.Reading 1 (Double)	6275
Auxiliary.Reading 2 (Double)	6276
Auxiliary.Reading 3 (Long)	6277
Auxiliary.Reading 4 (Long)	6278
Auxiliary.Setting 1 (Double)	6271
Auxiliary.Setting 2 (Double)	6272
Auxiliary.Setting 3 (Long)	6273
Auxiliary.Setting 4 (Long)	6274
DCX-127.DC Out 1	5258
DCX-127.DC Out 2	5260
DCX-127.Dig In	5953
DCX-127.Dig Out	5265
DCX-127.DMM Volts	5951
DCX-127.Gate Delay	5271
DCX-127.Port A	5268
DCX-127.Port B	5269
DCX-127.Port C	5270
DCX-127.Port D	5272
Digital Generator.Burst Interval	5129
Digital Generator.Burst Low Level	5130
Digital Generator.Burst On	5128
Digital Generator.ChA Amplitude	5106
Digital Generator.ChB Amplitude	5107
igital Generator.Dual Amp Ratio	5132
Digital Generator.Frequency	5102
Digital Generator.Frequency 2	5115

Digital Generator.High Freq	5133
Digital Generator.IM Freq	5104
Digital Generator.Offset	5136
Digital Generator.Phase	5131
Digital Generator.Samples/Step	5135
Digital I/O.Input Jitter Ampl.	6105
Digital I/O.Input Resolution	5325
Digital I/O.Input Sample Rate	6101
Digital I/O.Input Voltage	6102
Digital I/O.Output Resolution	5326
Digital I/O.Output Sample Rate	5301
Digital I/O.Output Voltage	5304
Distortion.ChA Fund Ampl	6125
Distortion.ChA Fund Freq	6127
Distortion.ChA Harm Sum1	6129
Distortion.ChA Harm Sum2	6130
istortion.ChB Fund Ampl	6126
Distortion.ChB Fund Freq	6128
Distortion.ChB Harm Sum1	6131
Distortion.ChB Harm Sum2	6132
Distortion.Freq	6384
Interface.Amplitude	6053
Interface.Amplitude(Prob)	5614
Interface.Frequency	5613
Interface.Jitter(Prob)	5615
Interface.Jitter(sec)	6055
Interface.Jitter(UI)	6058
Interface.Probability	6054
Interface.Time	5612
Multitone.ChA Amplitude	6310
Multitone.ChA Phase	6033
Multitone.ChB Amplitude	6313
Multitone.ChB Phase	6034
Multitone.Frequency	5621
Multitone.Resolution	5633
Multitone.Time	5620
Multitone.Trigger Delay	5634
None.None.	5049
Spectrum.ChA Amplitude	6024

Spectrum.ChA Phase	6065
Spectrum.ChB Amplitude	6027
Spectrum.ChB Phase	6066
Spectrum.Frequency	5515
Spectrum.Pre-Trig Time	5519
Spectrum.Start Time	5518
Spectrum.Time	5516
Switcher.ChA Input	5201
Switcher.ChA Input/Output	5206
Switcher.ChA Output	5203
Switcher.ChA+B Input	5208
Switcher.ChA+B Input/Output	5210
Switcher.ChA+B Output	5209
Switcher.ChB Input	5202
Switcher.ChB Input/Output	5207
Switcher.ChB Output	5204
Sync/Ref.In from Ref In Delay	6103
Time.Time.External Sweep Time	6253
Time.Time.Time Since Test Loaded	6251

Appendix C

FFT Window Descriptions

Window	Description
Hann	This window is a raised cosine window named after its inventor, Austrian meteorologist Julius von Hann. It provides good selectivity near the center frequency with no side lobes. Its skirts are not as steep as the Blackman-Harris window. The Hann window causes approximately a -1.5 dB maximum amplitude error due to window attenuation if the signal is at the extreme edge of the bin.
Flat-Top	This window is designed for the greatest amplitude measurement accuracy. It provides a maximum amplitude error due to window attenuation of less than 0.02 dB even if the signal is at the extreme end of the bin. However, its selectivity is poorer than either Hann or Blackman-Harris. The Flat-Top window is the appropriate window for accurate amplitude measurements (such as when measuring individual harmonics) except when signals are so closely spaced that its selectivity becomes a problem. For example, the 2.93 Hz bin width of a 16,384 sample FFT at the 48 kHz sample rate would permit accurate measurements of signals differing by nearly 90 dB in amplitude as long as they are at least 26.4 Hz (9 bins) apart
BH4	The Blackman-Harris 4-term minimum sidelobe window furnished as part of several Audio Precision FFT programs was developed by R.B. Blackman and F.J. Harris. Compared to the Hann window, it is not as selective near the nose but has steeper skirts below that point. The Blackman-Harris window has sidelobes below -92 dB (response fall-off is not monotonic). It has a reasonably flat top with a maximum amplitude error of about -0.8 dB if the signal is at the extreme edge of the bin.

Equiripple	The Equiripple window, developed at Audio Precision, is an approximation to the Dolph-Chebyshev window which provides the narrowest mainlobe width for a given maximum sidelobe depth. The mainlobe is approximately 12 bins wide; that is, the first null is about 6 bins away from the mainlobe center. The first sidelobe, which is also the highest sidelobe, is 147 dB down from the mainlobe. Maximum amplitude error across the bin is approximately 0.6 dB.
Hamming	The Hamming window has the sharpest nose selectivity of all the furnished windows. Adjacent bins average about 7 dB down and two bins away the response is about 40 dB down. Amplitude error is about -1.7 dB for a signal at the extreme edge of a bin. The Hamming window has side lobes (that is, response fall-off is not monotonic) starting only 40-50 dB below the center bin, or about 4 bins away from center. The cyan trace shows the Equiripple window, for reference.
Gaussian	The Gaussian window nose selectivity is only slightly wider than the Blackman Harris window and the near-by rejection is considerably better than Blackman Harris, reaching an average of 100 dB down in the fifth bin away from center. The side lobes are down more than 130 dB, compared to about -100 dB for Blackman Harris. Maximum amplitude error is about -0.7 dB for a signal at bin edge.
Rife-Vincent 4	Both Rife-Vincent windows have smooth, monotonically-falling responses with no sidelobes. The Rife-Vincent 4 window has about -0.6 dB maximum amplitude error, is down about -100 dB 7 bins off and about -150 dB 15 bins off. The Rife-Vincent 5 is slightly wider at the nose, with about -0.5 dB maximum amplitude error with a signal at bin edge. It has sharper skirts with attenuation reaching about 106 dB 7 bins off and about 150 dB 12 bins off.
Rife-Vincent 5	See Rife-Vincent 4 above.