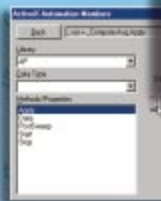
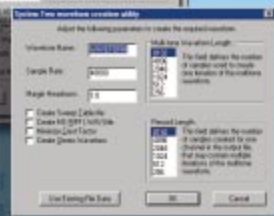
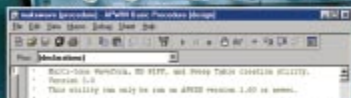


APWIN BASIC EXTENSIONS REFERENCE FOR SYSTEM TWO CASCADE

APWIN



APWIN BASIC Extensions Reference for System Two Cascade



Version 2
August, 1999

APWIN Basic Extensions Reference for System Two Cascade

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Version 2 August, 1999

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APWIN Basic Extensions Reference

Introduction

This chapter of the manual is divided into three sections.

The first section consists of APWIN 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 APBASIC extensions.

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

Part	Description
<i>Syntax:</i>	Programming usage information.
<i>Command</i>	
<i>type:</i>	Method or Property
<i>Data type:</i>	Setting Data Type.
<i>Result:</i>	Query Data Type.
<i>Description:</i>	Technical Information.
<i>See also:</i>	Commands related to the current command that may contain relevant information.
<i>Example:</i>	Example procedure/macro
<i>Example</i>	
<i>Output:</i>	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.
<i>Comments:</i>	Additional information relating to the example procedure/macro.

Manual Conventions

This manual uses the following typographic conventions.

Example	Description
<i>event,</i> <i>var, arg</i>	For the syntax part of each command, italicized words indicate placeholders where the user must enter additional information.
FILENAME.TXT	Words in all CAPITOL letters indicate file names.
Sub Main AP.Gen.Amp = 1.0 End Sub	This font is used in all example macros and code modules.
[<i>expression list</i>]	In syntax, items inside square brackets are optional.
{ <i>while</i> <i>until</i> }	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.
AP.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.

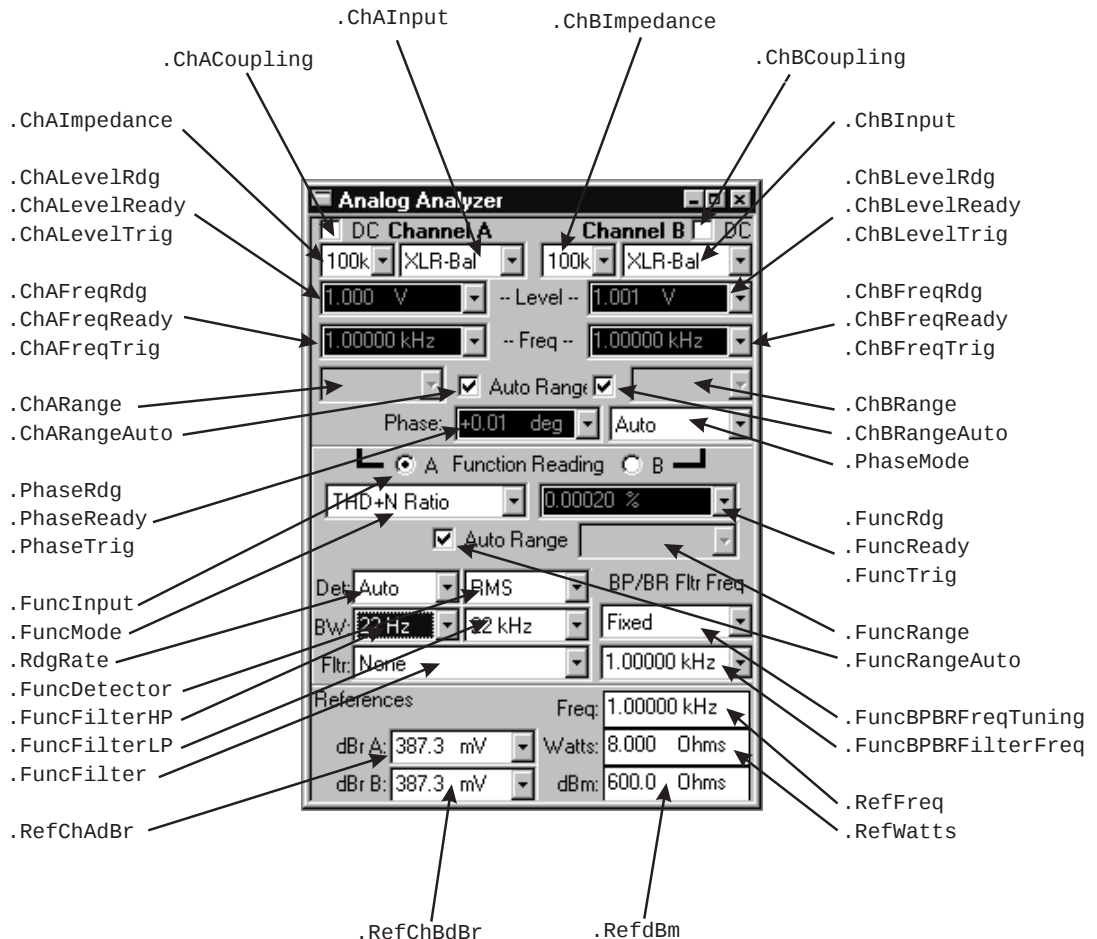
System Panels

Analog Analyzer

All commands on this page start with the following:

AP.Anlr

Example: AP.Anlr.ChACoupling



Analog Analyzer

AP.Anlr.ChACoupling

Property

Syntax `AP.Anlr.ChACoupling`

Data Type Boolean

True DC coupled.

False Not DC coupled.

Description This command sets channel A Input Coupling to DC. This enables System Two to DC couple the input to the A/D converter for improved CMRR at low frequencies and increased low frequency measurement capability. By DC coupling the Analog Analyzer and DSP Audio Analyzer inputs DC Volts can be measured.

See Also `AP.Anlr.ChBCoupling`

Example

```
Sub Main
    AP.Application.NewTest          'Reset panels
    AP.Application.PanelClose(apbPanelAnlrSmall)
    AP.Application.PanelClose(apbPanelAnalogGenSmall)
    AP.Application.PanelOpen(apbPanelAnlrLarge)
    AP.S2CDsp.Program = 1 'Select DSP Audio Analyzer
    AP.Application.PanelOpen(apbDSPPanelLarge)
    AP.S2CDsp.Analyzer.InputFormat = 1 'Select A/D Input
    AP.Anlr.ChACoupling = True
    AP.Anlr.ChBCoupling = True
    AP.S2CDsp.Analyzer.ChACoupling = True
    AP.S2CDsp.Analyzer.ChBCoupling = True
    'Get readings.
    Wait 1
    Reading1 = AP.S2CDsp.Analyzer.ChALevelRdg("V")
    Reading2 = AP.S2CDsp.Analyzer.ChBLevelRdg("V")
    Debug.Print "Channel A DC Level = "; _
        Format(Reading1, "#.0000");" VDC"
    Debug.Print "Channel B DC Level = "; _
        Format(Reading2, "#.0000");" VDC"
End Sub
```

Example Output Channel A DC Level = 9.1081 VDC
Channel B DC Level = .0004 VDC

AP.Anlr.ChAFreqRdg

Property

Syntax	AP.Anlr.ChAFreqRdg(ByVal Unit As String)	
Data Type	Double	
Parameters	Part	Description
	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 channel A Frequency meter and zeros the ready count.	
See Also	AP.Anlr.ChAFreqReady, AP.Anlr.ChAFreqSettling, AP.Anlr.ChAFreqTrig	
Example	Sub Main	
	AP.Application.NewTest 'Reset panels AP.Gen.Output = 1 AP.Anlr.ChAInput = 1 AP.Anlr.ChAFreqSettling(.5, .0002, "Hz", 3, .03, 1) AP.Anlr.ChAFreqTrig 'Trigger new reading. Do Ready = AP.Anlr.ChAFreqReady 'Get status. Loop Until Ready > 0 Reading1 = AP.Anlr.ChAFreqRdg("Hz") 'Get reading. Debug.Print "Frequency A = ";Format(Reading1, _ "#.0000");" Hz" End Sub	

Example Output Frequency A = 1002.9112 Hz

AP.Anlr.ChAFreqReady

Property

Syntax	AP.Anlr.ChAFreqReady	
Data Type	Integer	

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 Source parameter permitted to proceed to the next step.

Settling Parameter Discriptions

Name	Discription
<i>Tolerance</i>	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.
<i>Floor</i>	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

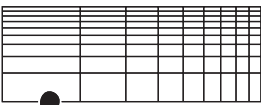
	is 147 dB down from the mainlobe. Maximum amplitude error across the bin is approximately 0.6 dB.
Hamming	The Hamming window has the sharpest nose selectivity of all the furnished windows. Adjacent bins average about 7 dB down and two bins away the response is about 40 dB down. Amplitude error is about -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.

Appendix D Extensions Error Codes

Errors

Codes	Description
8501	Undefined DSP error.
8503	Minimum generator amplitude attempted.
8504	Maximum generator amplitude attempted.
8505	Minimum generator frequency attempted.
8506	Maximum generator frequency attempted.
8523	Error reading waveform file.
8526	Error writing waveform file.
8544	Bad selection attempted.
8549	Burst on cycles greater than interval cycles.
8552	Maximum DC Volts output attempted.
8553	Minimum DC Volts output attempted.
8569	DSP is not returning readings.
8570	DSP Host vector %1 not available.
8571	DSP Transmit register not available.
8572	DSP Receive register not available.
8578	Error loading DSP program.
8581	Error loading DSP program.
8583	Conflict with minimum DSP setting value.
8584	Conflict with maximum DSP setting value.
8590	DSP not responding to reset.
8591	File specified not a valid DSP File.
8594	Waveform transfer not supported by this DSP program.
8596	DSP reading unit selected must have input source from Analyzer.
8597	Ratio unit not supported for DSP readings from ANLR-A or ANLR-B.
8599	Minimum BPBR frequency attempted.
8600	Maximum BPBR frequency attempted.
8611	DIO Host vector not available.
8612	DIO Transmit register not available.
8613	DIO Receive register not available.



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