



AcquiFlex User Manual

For CH/XH Series

Ref: AcquiFlex
V1.0

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1 Introduction

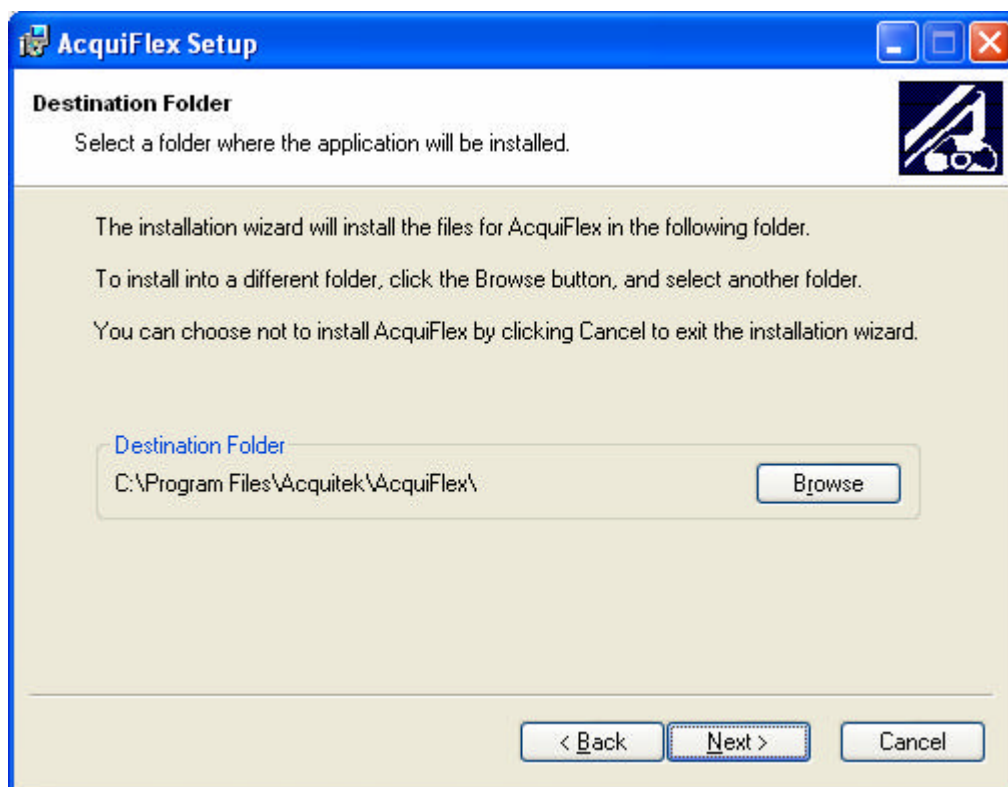
This manual contains operating information for AcquiFlex Software Toolbox.

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2 Installation

Please report to the CH or XH User Manual for hardware installation. Once done, just click on the setup file and follow the process.



3 Operating AcquiFlex

3.1 Oscilloscope control

3.2 Oscilloscope control



This figure shows the main Oscilloscope screen with a CH-3160 board (4 input channels) with the Zoom mode activates.

User can move each curve by moving the zero line of the selected channel. To rearrange all the curves just click on the "Reset Pos" button.

3.2.1 Menu



1: File

Exit: Exit from AcquiFlex

Load Setup: Load parameters of Oscilloscope, Generator and logical Analyzer previously save in .ini file

Save Setup: Save parameters of Oscilloscope, Generator and logical Analyzer. Save parameters in .ini file

2: Instrument



Oscilloscope:

Waveform Generator:

Logic Analyzer:

Show Oscilloscope display

Show Waveform Generator display

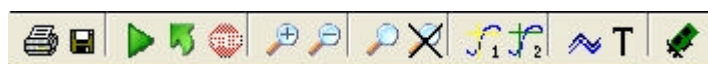
Show Logic Analyzer display















3: Tools

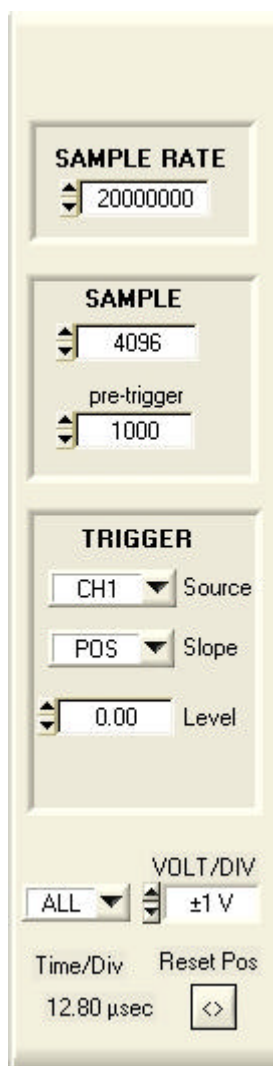
Autosave mode: See page 14 for details

4: About: Show Version and Serial Number

3.2.2 Toolbar



- | | | | | | | | | | | | | | |
|-----|-------------------------------------------------------------------------------------|---|---|---|---|---|---|---|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| 1: |  | | | | | | | | | | | | |
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| 2: |  | | | | | | | | | | | | |
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| 10: |  | | | | | | | | | | | | |
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| 11: |  | | | | | | | | | | | | |
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| 12: |  | | | | | | | | | | | | |
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| 13: |  | | | | | | | | | | | | |
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| 14: |  | | | | | | | | | | | | |
| | | | | | | | | | | | | | |



3.2.3 Horizontal Selection

Sample rate programmable from 10KS/s up to 40MS/s for one active channel, 20MS/s for two active channels, 10MS/s for four active channels with 1Hz resolution.

Sample size from 2048 samples up to 7999488 samples, modulo 2048 samples.

Pre-trigger mode from 0 up to Sample size. **T** icon available to display trigger position (ON/OFF). Pre-trigger mode is only available when Trigger source is CH1, CH2, CH3, CH4 or EXT.

3.2.4 Trigger Selection

Select Trigger source, CH1, CH2, CH3, CH4, NONE or EXT trigger. NONE means run immediately.

Select Slope Positive or Negative

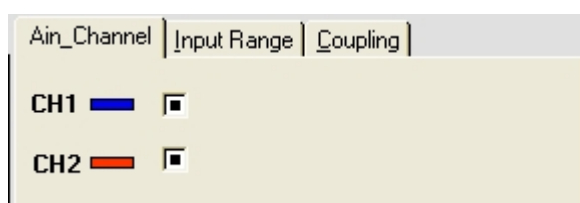
Select trigger Level

3.2.5 Vertical Scale Selection

Select Volt per division on all or Selected channel

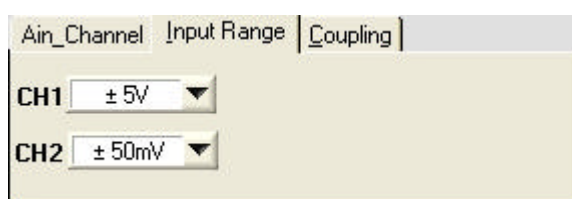
Reset channel position to default position

3.2.6 Channel display Selection



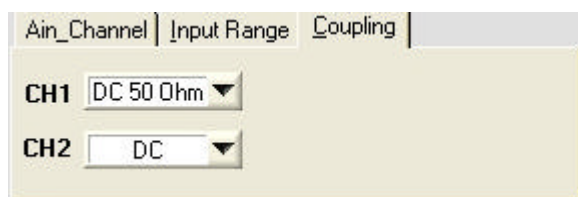
Click on binary switch for ON/OFF channel display

3.2.7 Vertical Selection



Vertical Range programmable for each channel
 ± 50 mV, ± 100 mV, ± 500 mV, ± 1 V, ± 2 V, ± 5 V

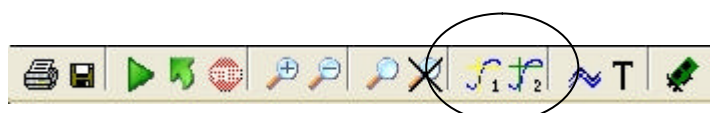
3.2.8 Coupling Selection



AC Coupling can block up to 25 VDC
DC Coupling, High impedance 1M Ohms
DC 50 Ohm, Low impedance, 50 Ohms
50 Ohms is the nominal termination impedance for the best signal integrity.

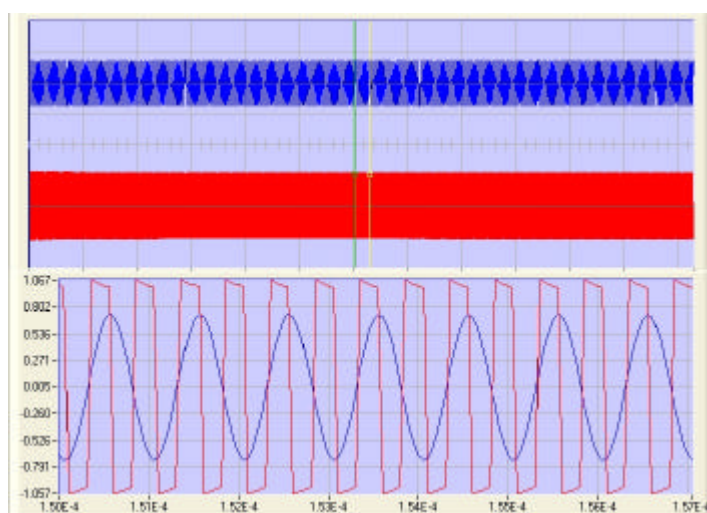
3.3 Oscilloscope Display Control

3.3.1 Cursor Selection



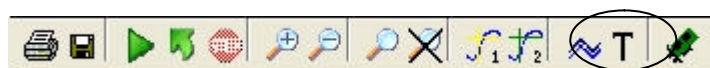
Two horizontal cursors are available, attached to Channel 1 only. The difference between both cursors is given at the right top corner in black color.

3.3.2 Zoom Selection



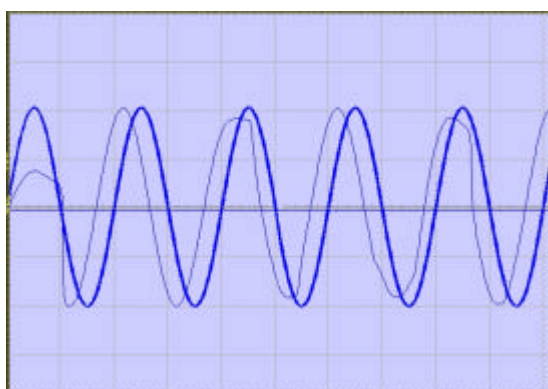
A zoom display is available, cursor 1 and 2 define the portion of curves displayed.

3.3.3 Trigger Line Selection



T Icon allows the trigger position to be displayed

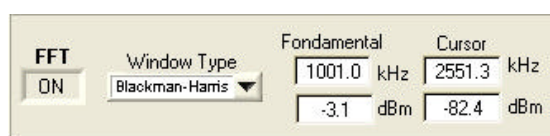
3.3.4 Persistence Selection



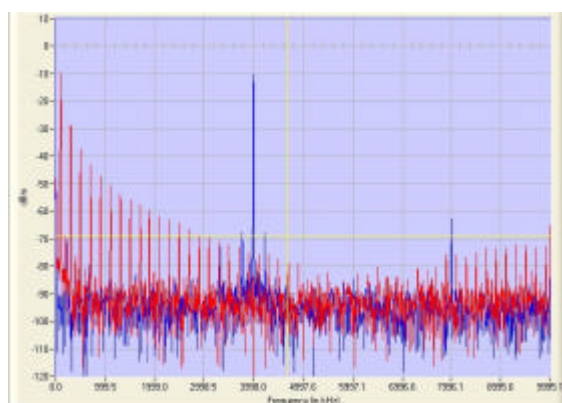
The Persistence setting allows the user to control the infinite persistence of the signal display in the display Window

Persistence mode allows signal monitoring and capture of erratic events

3.3.5 FFT Selection



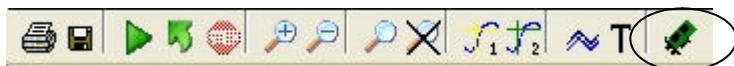
FFT ON bring up the multi-channels FFT display.
Display is in dBm



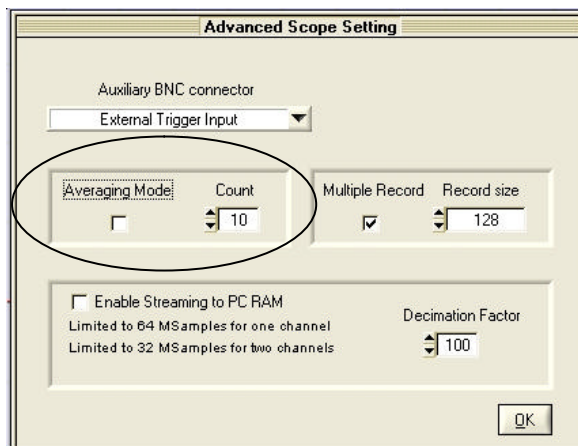
A choice of Windows is included:
Rectangular, Blackman-Harris,
Hanning, Hamming, Exact
Blackman, Blackman, Flat top

A cursor allows extracting the
frequency and magnitude of a
specific harmonic

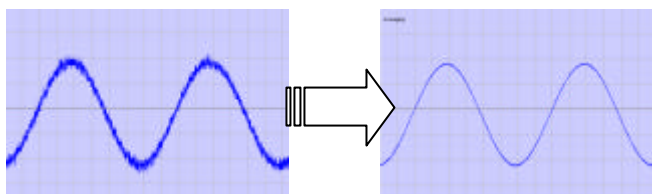
3.4 Advanced Oscilloscope Control



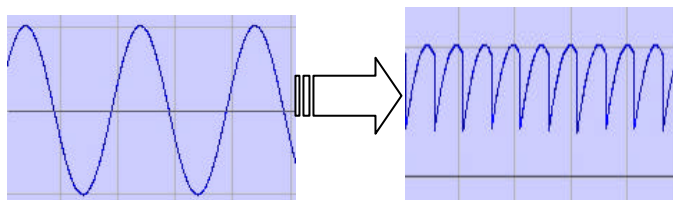
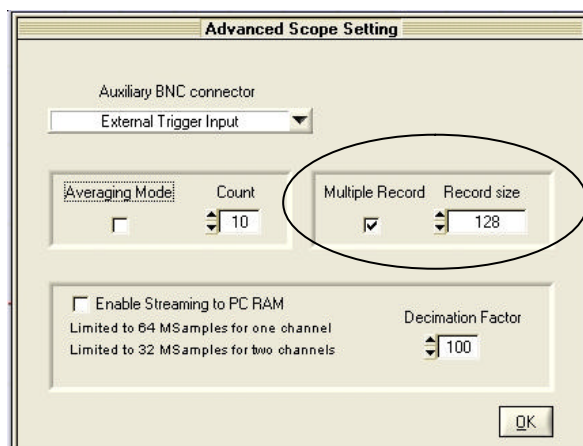
3.4.1 Averaging Control



The averaging control allows the user to capture many records, up to 256 and average them for display, default 10 counts

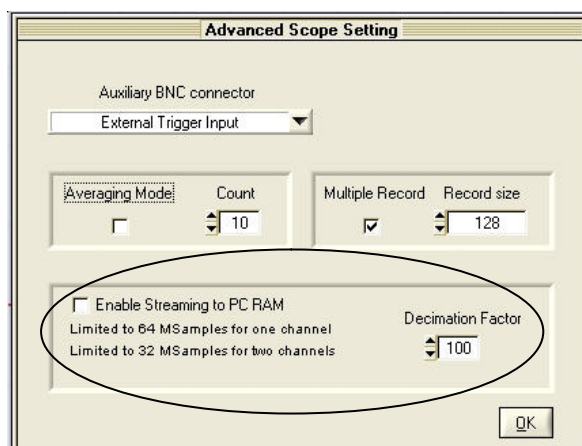


3.4.2 Multiple Record Mode



Applicable to a triggered input capture. When set to 0 (default), XDA_Ain_Start() captures the number of samples specified in SAMPLE field. When set to a non-zero number, it captures for this number of sample clocks following a trigger, then waits for the next trigger. This repeats until the number of samples specified in the SAMPLE parameter are captured. The burst size should be chosen as a function of sample rate so that the minimum time between triggers is at least 10 microseconds. It cannot be using simultaneously with pre-triggering.

3.4.3 Streaming to PC RAM control

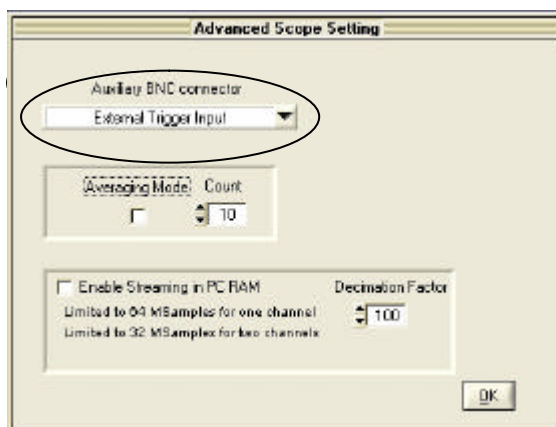


The Streaming control allows capture of very long stream of data, up to 64MS on one channel, 32MS on two channels and 16MS on four channels with Decimation factor to allows quick display of a large amount of data.

Decimation factor range from 1 to 1000
You can save all data in binary format only

Note that you cannot perform averaging while streaming mode is active.

3.4.4 Auxiliary BNC Connector



An auxiliary BNC connector is available for several functions. Only one of these functions is operable at any time.

- External analog trigger input
- D/A waveform sync output
- External clock input for the analog I/O channels
- External clock output synchronous with the A/D clock or D/A clock.

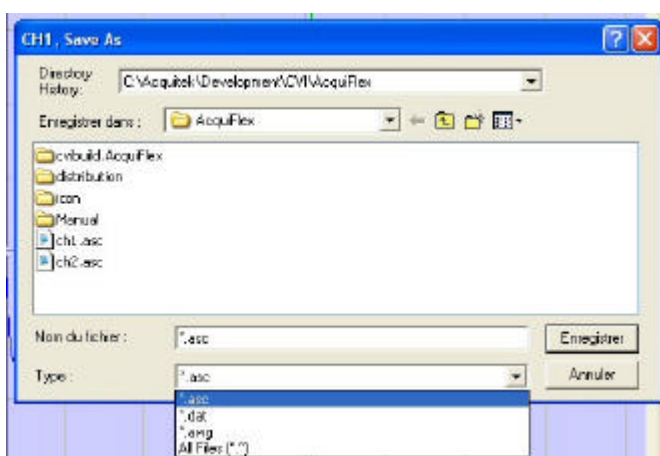
3.4.5 Waveforms saving Control



Click on Diskette to enable channel saving mode



Select Channel to be saved and click on save button



The three formats available are asc, dat and awg

*.asc: ASCII

The ASCII file content header with acquisition parameters:

Acquisition on CH1

Date: 11/1/2005 at 16:49:16

Sampling rate: 10000000

Input Range: 2.00

Total Number of Samples: 4096

Number of Pre-Samples: 0

-0.806641

-0.776367

-0.445312

0.051758

0.532227

0.809570

0.774414

0.443359

***.dat:** Binary

Header information is available at the top of the file, following by the raw data
Information Structure of the Header

```
{
    int Day;           // 4 bytes
    int Month;         // 4 bytes
    int Year ;         // 4 bytes
    int Hour ;         // 4 bytes
    int Min ;          // 4 bytes
    int Sec ;          // 4 bytes
    double iClockRate ; // 8 bytes
    double Range ;     // 8 bytes
    int Samples ;      // 4 bytes
    int pre_Samples ;  // 4 bytes
}
```

} Header ;

Header size = 48 bytes

Raw data are signed 16-bit integer. It can take values between –2047 to 2047

-2047 → Minimum value of the current input range

0 → 0V

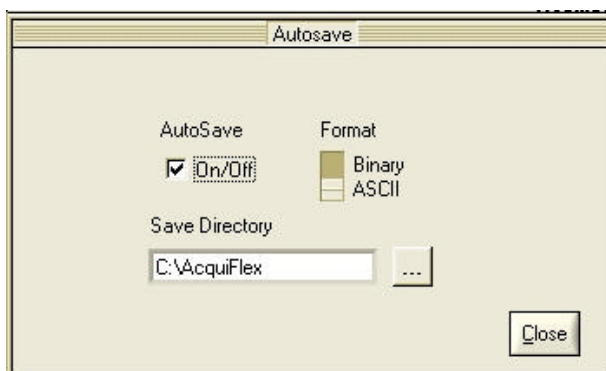
2047 → Maximum value of the current input range

This binary format is the only one available in Streaming capture.

***.awg:** ASCII

Two columns, one column as time information, second column as voltage. This file is straight compatible with the CubeScope-20 waveform generators.

3.5 Autosave Mode

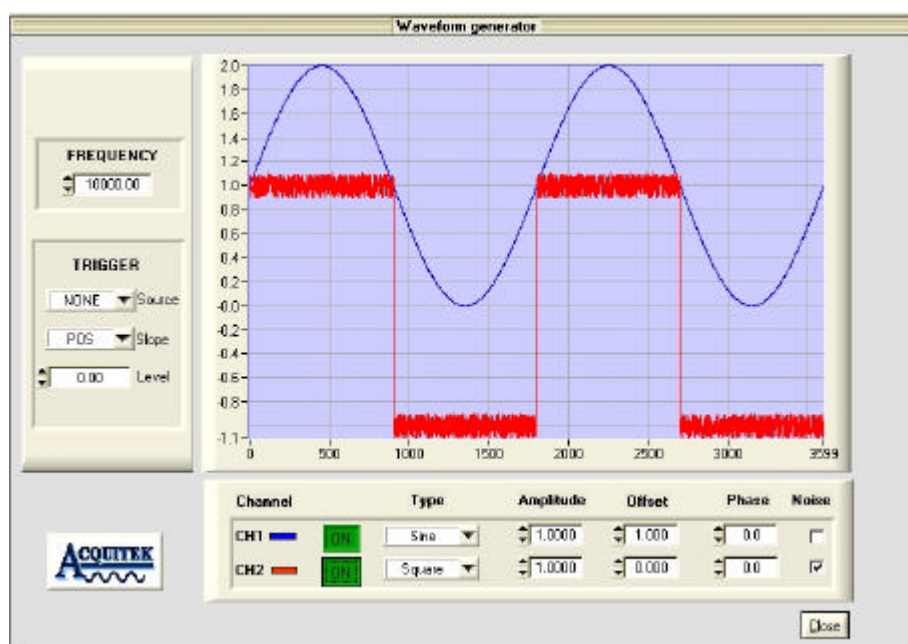


Autosave is a very powerful tool for data transient signals acquisition. It allows signals monitoring and data capture to disk with time and date stamping on the trigger occurrences. The channels are saved to file using the current hardware configuration defined in the Oscilloscope instrument.

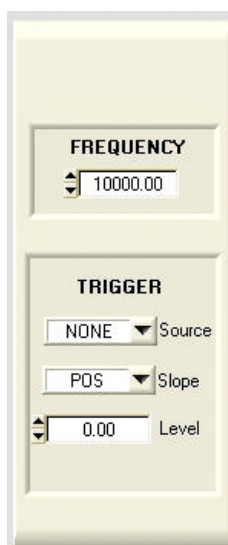
Waveforms are saved automatically on the disk in binary or ASCII format, user selection.

The dialog box allows selection of the target directory

Waveform Generator



3.5.1 Frequency & Trigger Control







Output frequency is programmable from 0.01Hz up to 10MHz (one channel) 5MHz (two channels)
 The 8MHz bandwidth of the generator will cause attenuation for any generated signal between 8MHz and 10MHz. Default is 10000 Hz.

There are four trigger sources
 NONE: Run immediately
 EXT: Run infinitely on external Trigger
 CH1 Input: Run when trigger on Channel 1 occurred
 CH2 Input: Run when trigger on Channel 2 occurred

Slope and Level apply on Input Channels and Auxiliary

3.5.2 Functions control

Channel	Type	Amplitude	Offset	Phase	Noise
CH1 	 Sine	<input type="text" value="1.0000"/>	<input type="text" value="1.000"/>	<input type="text" value="0.0"/>	<input type="checkbox"/>
CH2 	 Square	<input type="text" value="1.0000"/>	<input type="text" value="0.000"/>	<input type="text" value="0.0"/>	<input checked="" type="checkbox"/>

Type: Sine, Square, Triangle, Sawtooth, White Noise, DC and arbitrary Waveform File
 Amplitude: Output amplitude is +/- selected value into 50 Ohms, +/-5V maximum, 1V default

Offset: DC value, +/- 5V maximum, 0V default

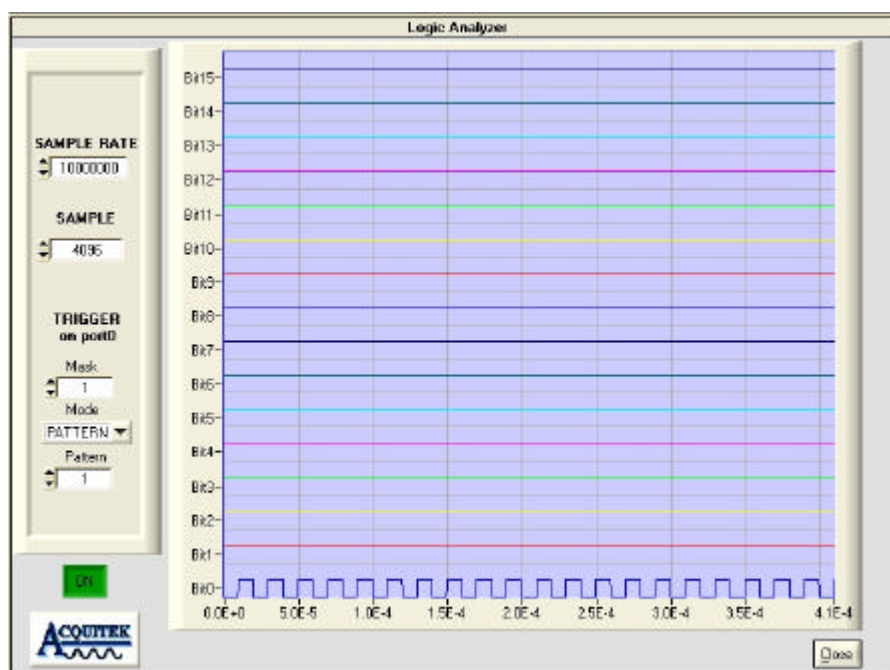
Phase: -360° to +360°, 0° is the default value

Noise: Add 10% of selected amplitude with white noise

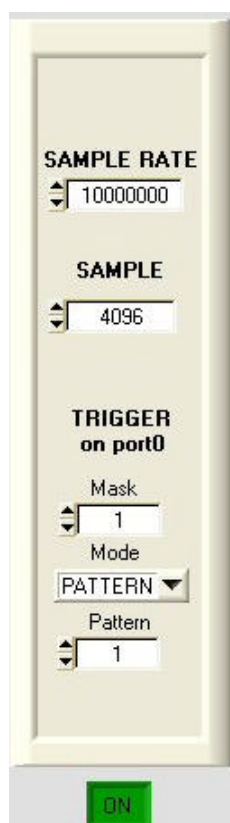
When File wavetype is chosen, selects the file containing waveform data. Each line of the file should contain a time offset value followed by a tab, then the sample value in volt and a carriage return. The number of samples must be a multiple of 32.

Press the ON button of the selected channel to generate the waveform. Press OFF to stop.

3.6 Logic Analyzer



3.6.1 Frequency & Trigger Control



Sample Rate is programmable from 10 KHz up to 40 MHz
Default value, 10MHz

Sample size from 2048 samples up to 1MSamples,
modulo 2048 samples.

Trigger on pattern available on port 0 only

Mask: Enable bit for trigger

Ex: Mask = 7 enable bit 0, 1 & 2

Mode: NONE, PATTERN

If PATTERN is selected

Ex: Pattern = 4, trigger will occur on

Bit 0 = 0

Bit 1 = 0

Bit 2 = 1

Logic Analyzer cannot be use in the same time as the oscilloscope