

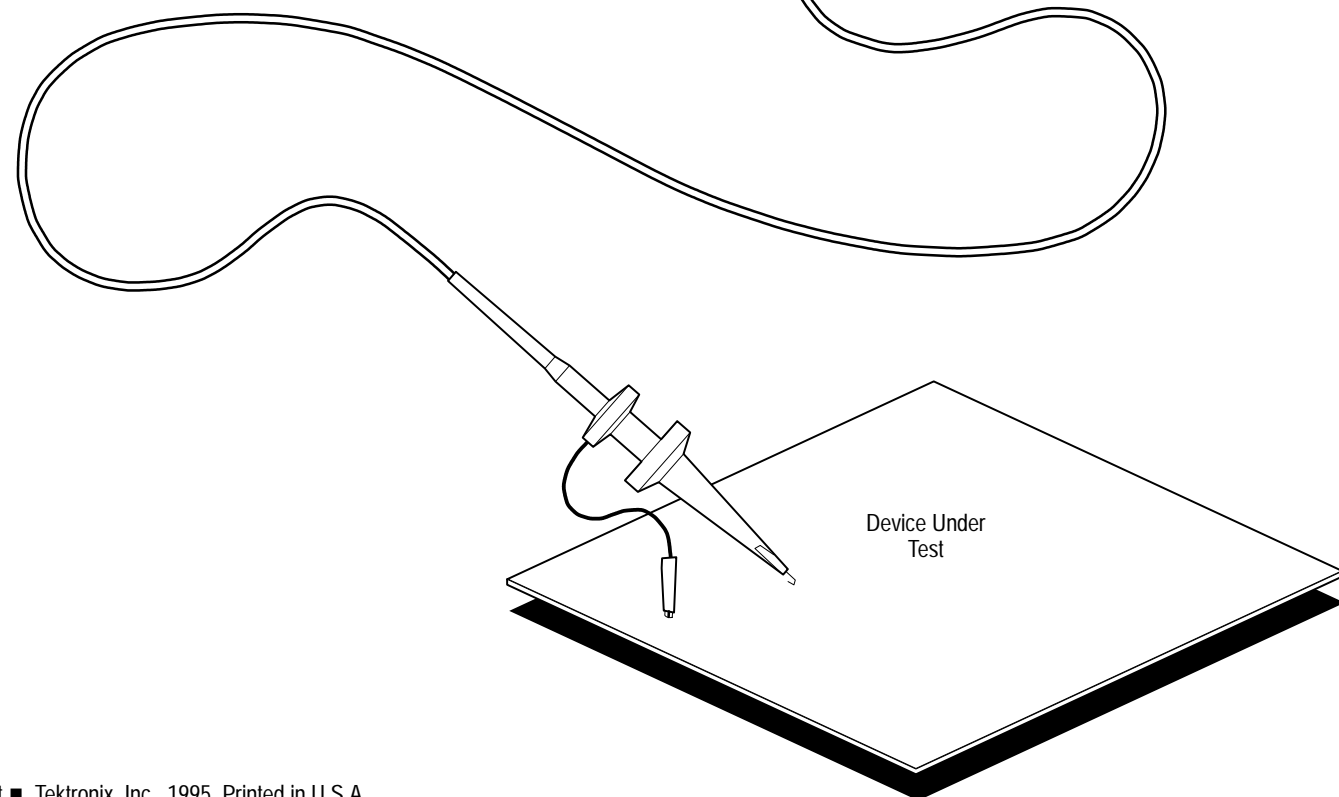
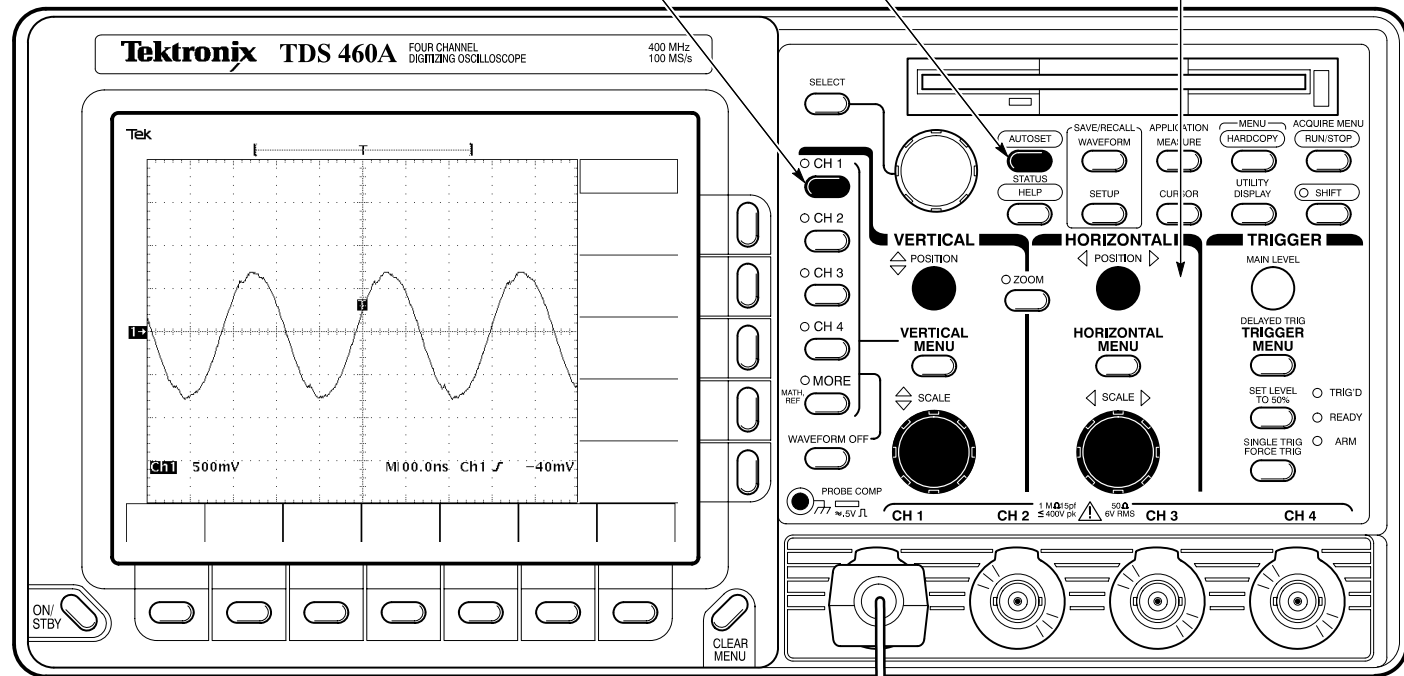
Reference

**TDS 410A, TDS 420A & TDS 460A
Digitizing Oscilloscopes**

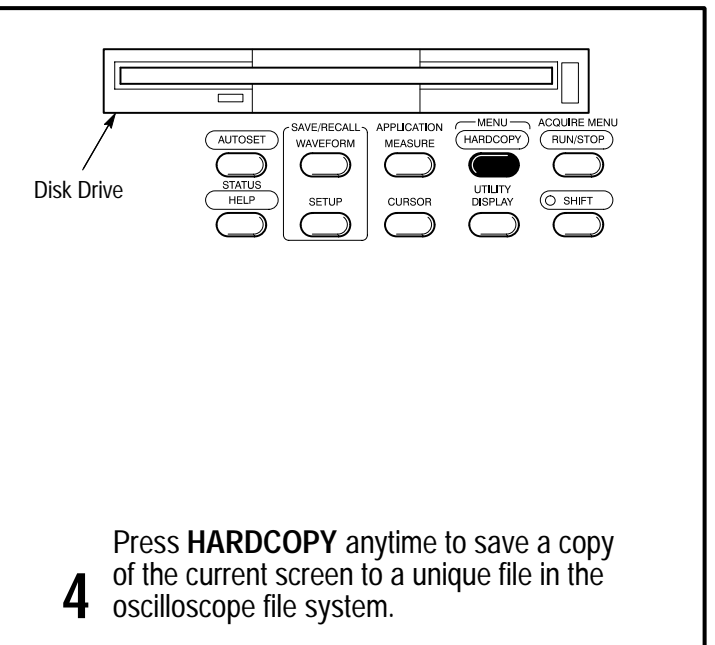
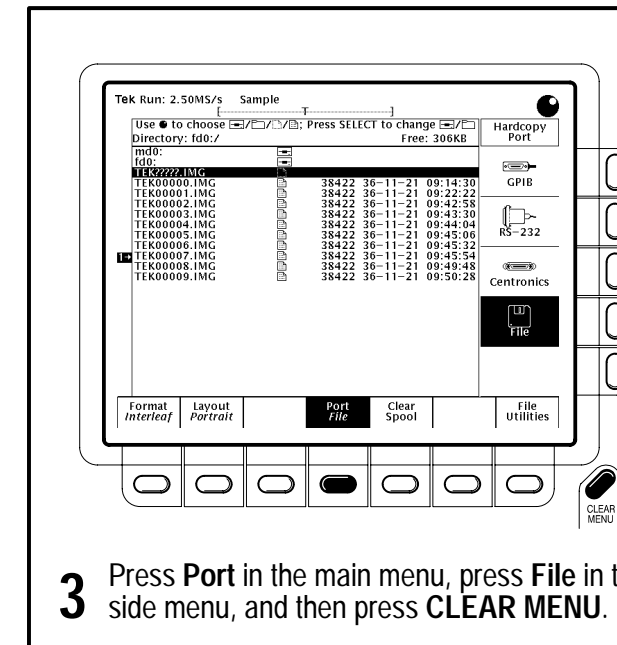
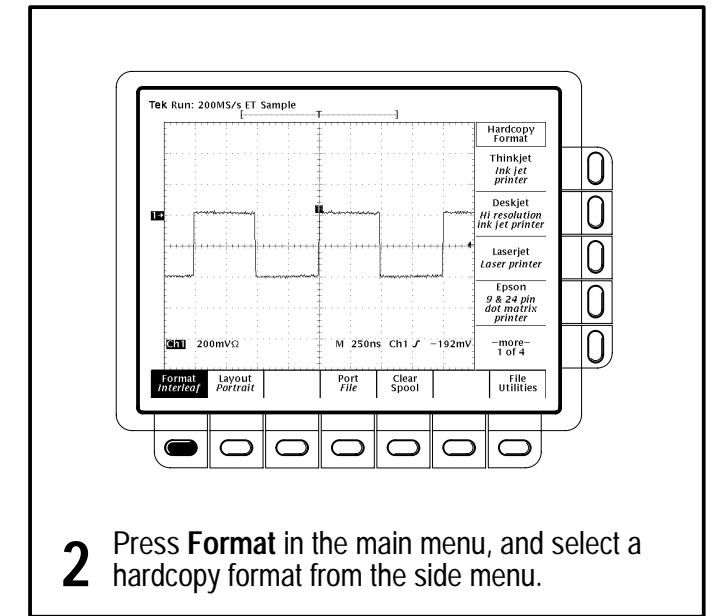
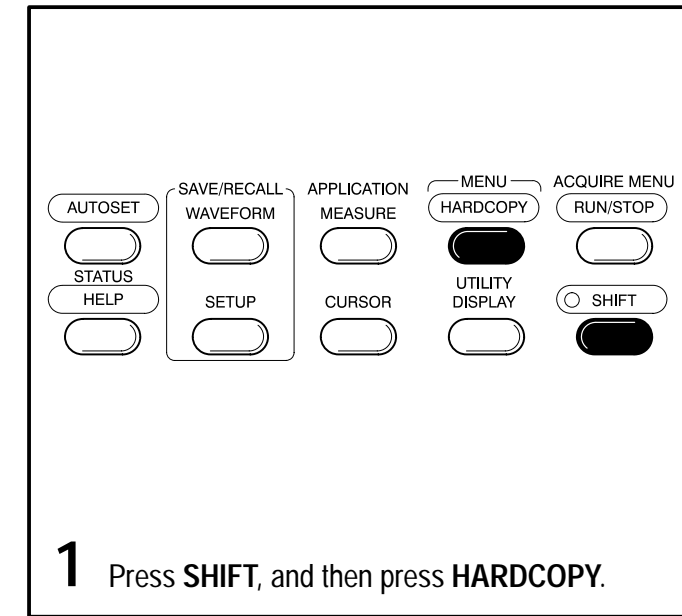
070-9220-00

To Display a Waveform:

- 1 Attach a probe to CH 1 and hook it up to your signal.
- 2 Press CH 1 button.
- 3 Press AUTOSET.
- 4 Adjust VERTICAL POSITION and HORIZONTAL POSITION and SCALE as desired.



To Save a Hardcopy to the File System:



To Perform Other File System Operations:

Press **SAVE/RECALL WAVEFORM**, and use the menu buttons to save a waveform to a file or recall it from a file.

Press **SAVE/RECALL SETUP**, and use the menu buttons to save a setup to a file or recall it from a file.

Press **File Utilities** in the Save/Recall Waveform, Save/Recall Setup, or Hardcopy menus to access utilities that create directories, copy files, and do other operations in the oscilloscope file system.

To Zoom a Waveform:

1 Press the **ZOOM** button.

2 Press **Mode** in the the main menu.

3 Select any displayed item from the side menu.

To Perform Other Zoom Operations:

- Turn the Vertical and Horizontal **SCALE** and **POSITION** knobs to adjust the scale and position factors of the acquisition or the zoomed waveforms.
- Press **Lock**, and then use the menu buttons to choose which waveform group to zoom horizontally.
- Press **Selected Graticule**, and use the menu buttons to direct the scale and position knobs to the upper (zoomed waveforms) or lower (acquisition waveforms) graticule in **Dual Zoom** or **Zoom Preview** modes.
- Press **Reset**, and press the **Reset All Factors** or **Reset Live Factors** menu buttons to reset the zoom factors.

To Set Up Using a Menu:

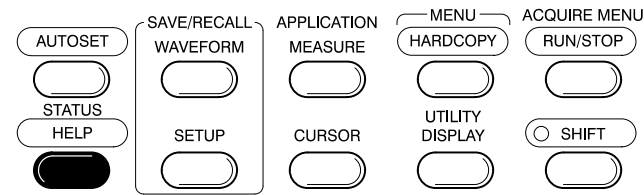
1 Press any of the front panel menu buttons.

2 Select an item from the main (bottom) menu.

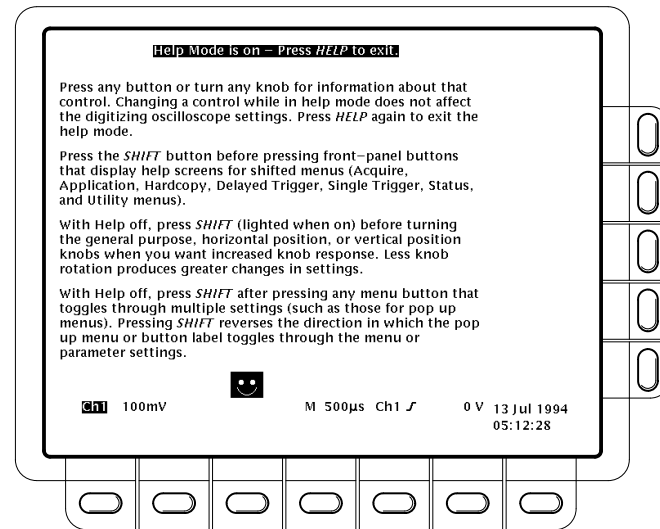
3 Select any displayed item from the side menu.

4 Adjust menu item values using the general purpose knob.

To Display Help On Screen:

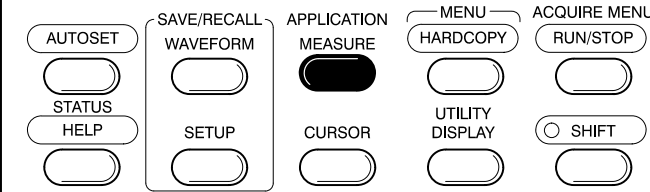


1 Press the **HELP** button.

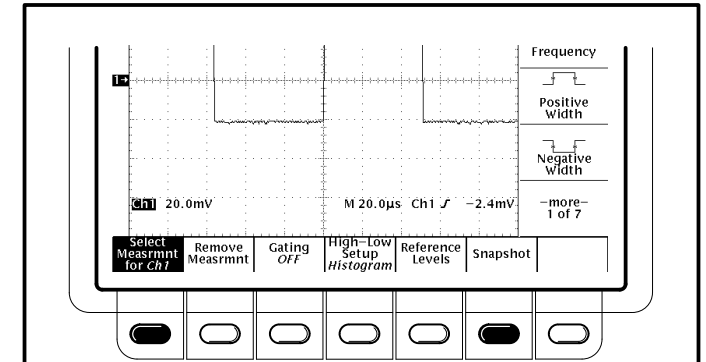


2 Now turn any knob or press any button and read a description of it on the display. Press the **HELP** button again to exit help.

To Take Measurements Automatically:

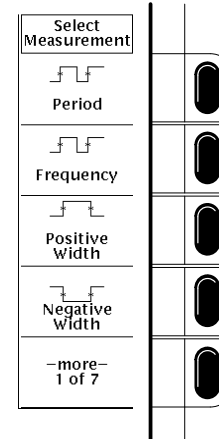


1 Press the **MEASURE** button.



2 Press **Select Measrmt** or **Snapshot** in main menu.

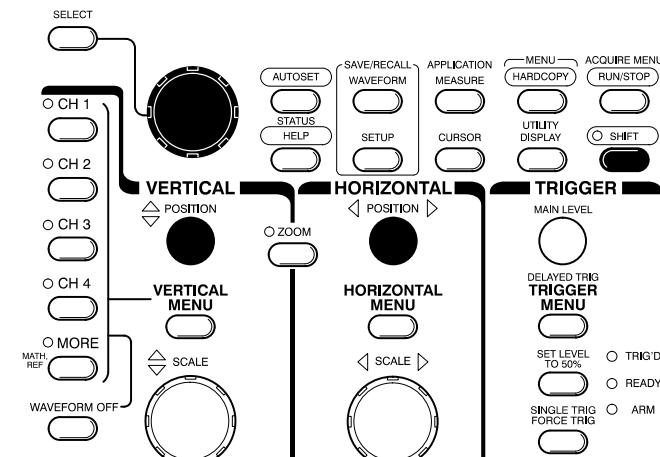
Automated Measurement Selections



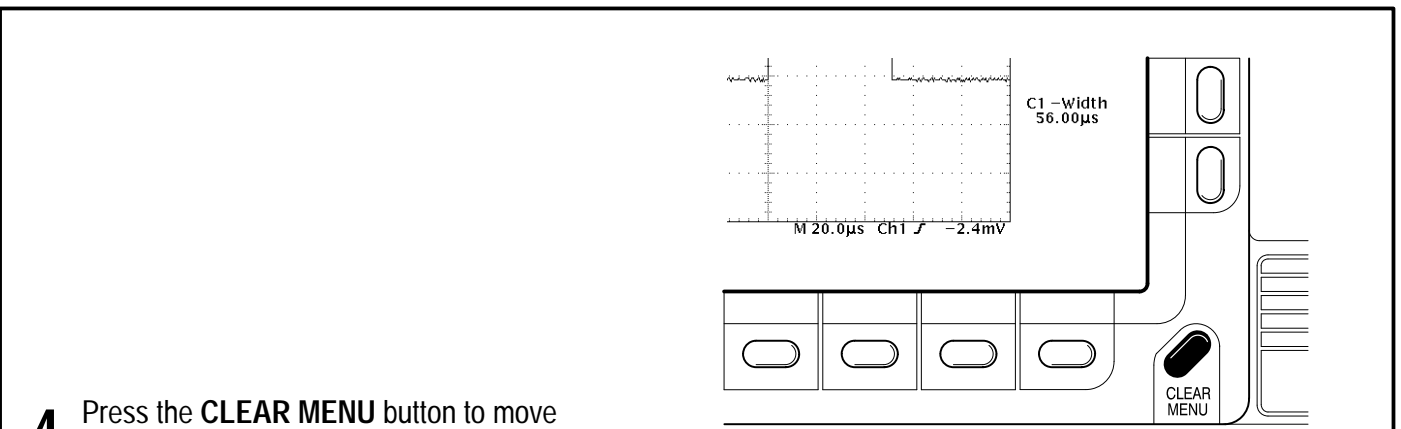
3 Select up to four measurements.

Select Measurement						
Period	Rise Time	Delay	High	Pk-Pk	Mean	Area
Frequency	Fall Time	Phase	Low	Amplitude	Cycle Mean	Cycle Area
Positive Width	Positive Duty Cycle	Burst Width	Max	Positive Overshoot	RMS	-more- 7 of 7
Negative Width	Negative Duty Cycle		Min	Negative Overshoot	Cycle RMS	To 1 of 7
-more- 1 of 7	-more- 2 of 7	-more- 3 of 7	-more- 4 of 7	-more- 5 of 7	-more- 6 of 7	

To Speed Up Knob Adjustments:



Press the **SHIFT** button to change the rate of the **VERTICAL** and **HORIZONTAL POSITION** knobs and the general purpose knob.



4 Press the **CLEAR MENU** button to move measurement readouts away from graticule.

To Take Measurements With Cursors:

1 Press **CURSOR** button.

2 Press **Function** in the main menu.

3 Select from the side menu.

- Measures Voltage
- Measures Time
- Measures Voltage at Time

4 Move cursor with the general purpose knob.
 Press **SELECT** to switch between cursors.
 Press **SHIFT** to speed up/slow down cursor movement.

Δ Difference Between Cursors in Volts (Horizontal Bars) or Time (Vertical Bars)
 @ Position of Active Cursor Relative to Ground (Horizontal Bars) or Trigger (Vertical Bars)

To Select a Trigger:

1 Press the **TRIGGER MENU** button.

3 Set **TRIGGER LEVEL** (Edge Trigger Only).

2 Select trigger type or parameter from main menu.

This Symbol Indicates Pop-Up Menu

TYPE <Edge>		TYPE <Video>	
Coupling	Slope	Video Class	Sync Polarity
DC DC	Positive	NTSC	Negative
AC AC	Negative	PAL	Positive
HF Reject		SECAM	
LF Reject		Custom	
Noise Rej (DC Low Sensitivity)			

"T" Shows Trigger Position

Press to Display Pop-Ups

Press Again to Make Selection

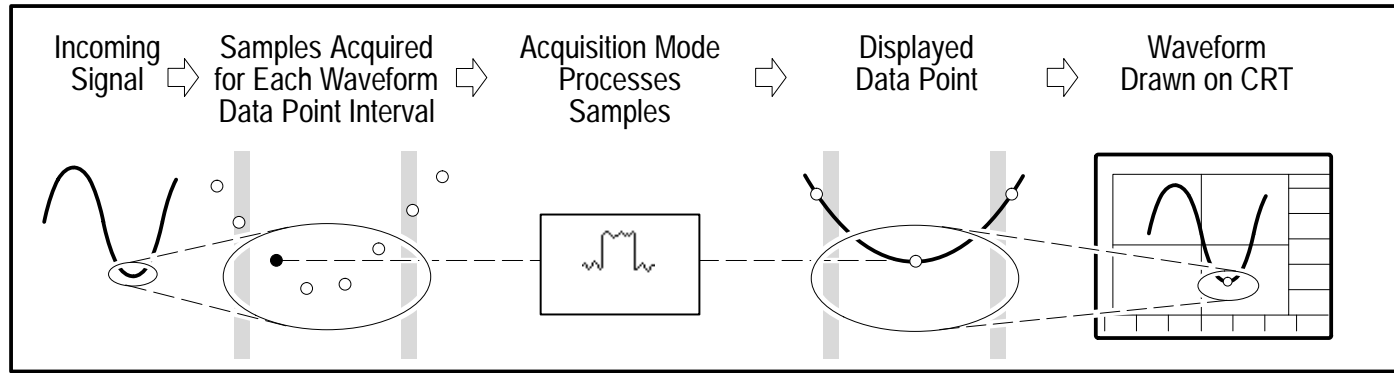
A Pop-Up Selection Changes the Other Main Menu Items

Title of Side Menu

Arrow Shows Trigger Level

Removes Menus From Screen

How the Acquisition Modes Work:



Single Waveform Acquisition	<p>Sample</p> <p>Uses first sample in interval</p>	<p>Use for fastest acquisition rate. Sample is the default mode.</p>
	<p>Peak Detect</p> <p>Uses highest and lowest samples in interval</p>	<p>Use to reveal aliasing and for glitch detection. Peak Detect provides the benefits of enveloping with speed of single acquisition.</p>
	<p>Hi Res</p> <p>Calculates average of samples in interval</p>	<p>Use to reduce apparent noise. Hi Res provides the benefits of averaging with the speed of single acquisition.</p>
Multiple Waveform Acquisitions	<p>Envelope</p> <p>Uses highest and lowest samples over many acquisitions</p>	<p>Use to reveal the noise band around the signal.</p>
	<p>Average</p> <p>Calculates average value over many acquisitions</p>	<p>Use to reduce apparent noise in a repetitive signal.</p>

To Choose an Acquisition Mode:

1 Press **SHIFT**, and then press **ACQUIRE MENU**.

2 Press **Mode** in main menu.

3 From side menu, select an acquisition mode that will serve your application.

To Use External Clock:

1 Press **HORIZONTAL MENU**.

2 Press **Clock** in main menu, and then press **External** in side menu.