

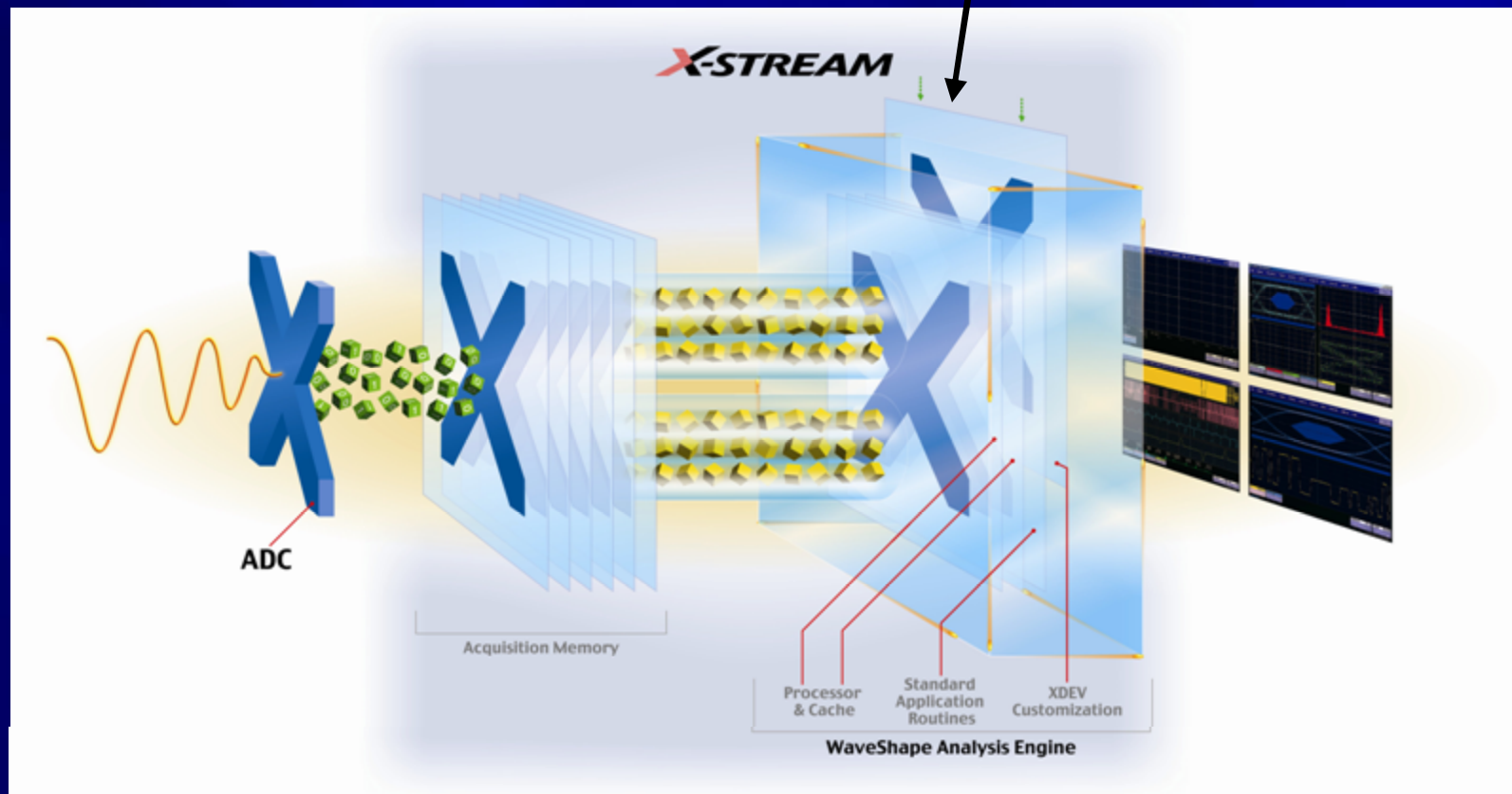


WaveMaster Customization

Using XDEV Advanced
Customization (available from LeCroy) and
MATLAB (available from The MathWorks)

X-STREAM Technology Makes XDEV Customization Possible

X-Stream's WaveShape Analysis Engine allows you to insert your own custom algorithm into the processing stream of the oscilloscope

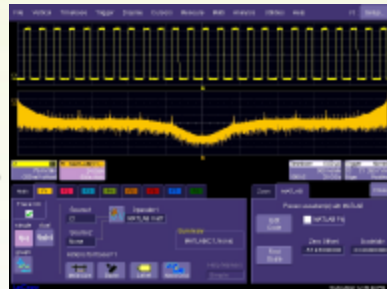
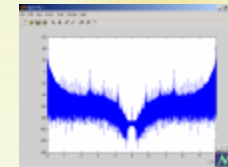


WaveMaster with LeCroy's XDEV Completely Integrates MATLAB

OTHER
OSCILLOSCOPES



DATA
EXPORT



DATA
EXPORT

INTEGRATION

RESULTS
IMPORTED



Step 1 – Select a Math Trace

The screenshot displays the LeCroy oscilloscope's Math menu. The main display shows a square wave trace labeled 'C1'. The menu is open, showing options for mathematical operations. The 'F1 setup...' option is highlighted in yellow. Below the menu, the 'Math' panel shows 'F1' selected. The 'Zoom' panel is also visible, showing 'Horizontal Center' and 'Vertical Center' settings.

Menu Options:

- f(x) Math Setup...
- M Memory Setup...
- F1 setup...**
- F2 setup...
- F3 setup...
- F4 setup...
- Math Status...

Trace Information:

- Trace: C1
- Scale: 79 mV/div
- Offset: -250 mV offset

System Settings:

- Timebase: 0.00 μ s
- Trigger: Normal
- 500 ns/div
- DC C1 260.7 mV
- 100 kS
- 20 GS/s
- Edge Positive

Math Panel:

- Math: F1, F2, F3, F4, F5, F6, F7, F8
- Trace On:
- single dual
- f(x) f(g(x))
- graph
- Source1: C1
- Operator1: only Zoom
- Summary: zoom(C1)
- Actions for trace F1: Measure, Store, Label, Next Grid
- Help Markers: Simple

Zoom Panel:

- Horizontal Center: 0
- Vertical Center: 0
- Scale / div: 1.00
- x 1.00
- Var.
- x 1.00
- Var.
- Reset Zoom

LeCroy 9/26/2002 9:43:44 AM

Step 2 – Select the MATLAB custom function

The screenshot displays the LeCroy oscilloscope software interface. The main window shows a waveform on a grid. A dialog box titled "Select Math Operator" is open, listing various math functions. The "MATLAB math" function is selected. The dialog box has a "Category" column and a "Choices" column. The "Choices" column contains a table with "Name" and "Description" columns.

Category	Choices																				
All Functions	<table border="1"><thead><tr><th>Name</th><th>Description</th></tr></thead><tbody><tr><td>MATLAB math</td><td>Produces a waveform using a user specified MATLAB function</td></tr><tr><td>Phistogram</td><td>Histogram of a slice through a persistence map</td></tr><tr><td>Ptrace mean</td><td>Generate a mean waveform from a persistence map</td></tr><tr><td>Ptrace range</td><td>Generate a waveform with a width derived from a population range of a persistence map</td></tr><tr><td>Ptrace sigma</td><td>Generate a waveform with a width derived from the sigma of a persistence map</td></tr><tr><td>Product</td><td>Product of two waveform inputs</td></tr><tr><td>Ratio</td><td>Ratio of input 1 to input 2</td></tr><tr><td>1/y</td><td>Reciprocal of the input waveform</td></tr><tr><td>Rescale</td><td>Scale the waveform (Y = aX+ b)</td></tr></tbody></table>	Name	Description	MATLAB math	Produces a waveform using a user specified MATLAB function	Phistogram	Histogram of a slice through a persistence map	Ptrace mean	Generate a mean waveform from a persistence map	Ptrace range	Generate a waveform with a width derived from a population range of a persistence map	Ptrace sigma	Generate a waveform with a width derived from the sigma of a persistence map	Product	Product of two waveform inputs	Ratio	Ratio of input 1 to input 2	1/y	Reciprocal of the input waveform	Rescale	Scale the waveform (Y = aX+ b)
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Basic Math																					
Custom																					
Filter																					
Frequency Analysis																					
Functions																					
Graphing																					
Jitter																					

The background interface shows a waveform on a grid. The waveform is labeled "C1" and has a scale of 81 mV/div and -254 mV offset. The "Math" menu is open, showing "F1" selected. The "Trace On" button is also visible. The bottom of the interface shows various utility buttons like "Measure", "Store", "Label", "Next Grid", "Help Markers", "Simple", "in", "out", "Reset Zoom", and "Close".

Step 3 – Load the MATLAB .m File in WaveMaster, or Type in the Algorithm

The screenshot displays the LeCroy WaveMaster software interface. The main window shows a waveform on the left and a MATLAB Editor window in the center. The MATLAB Editor window is titled "MATLAB Editor" and contains two sections: "MATLAB Code" and "MATLAB Response".

The "MATLAB Code" section contains the following code:

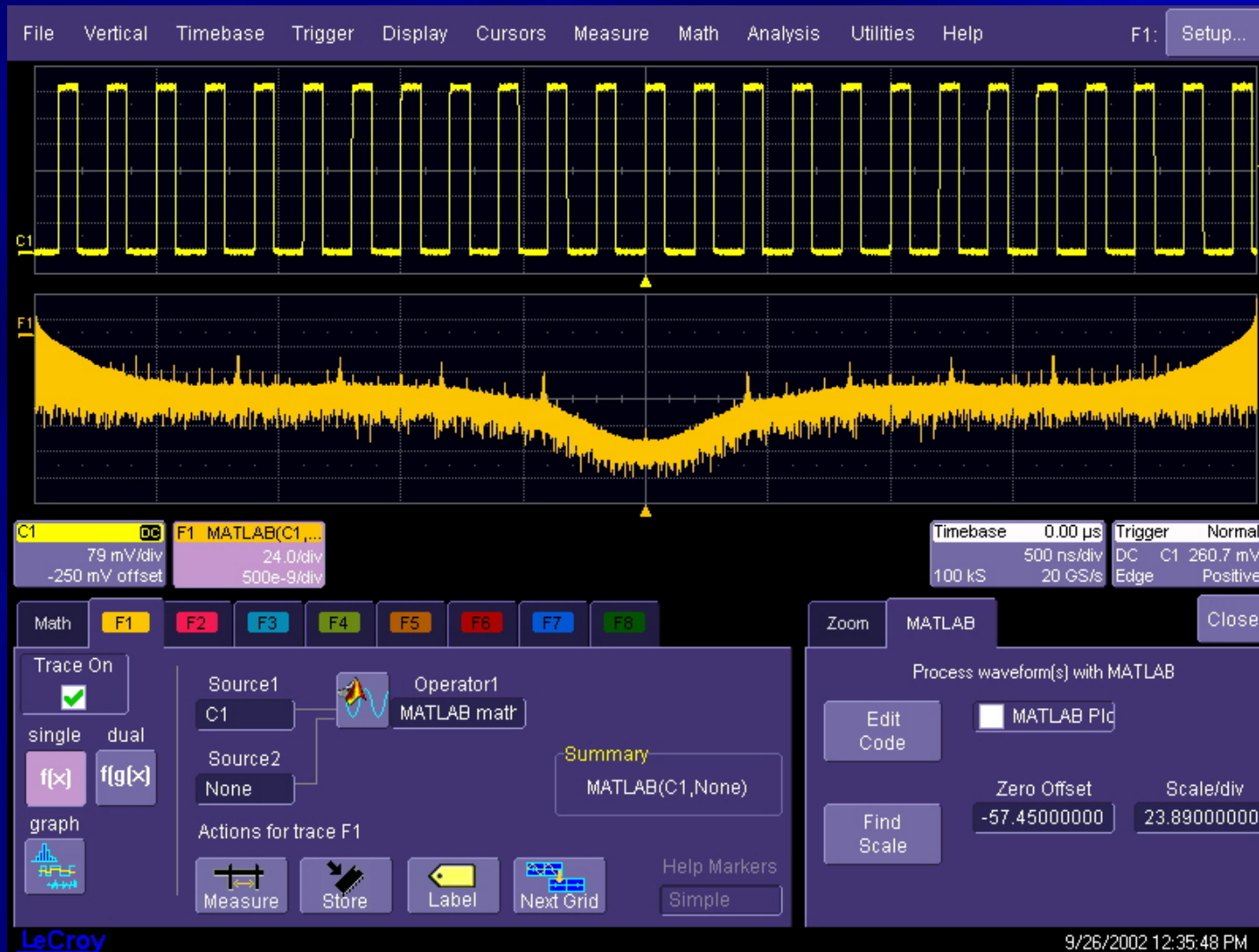
```
1 WformOut = xdevdemo(401, WformIn1);
```

The "MATLAB Response" section is currently empty, showing line numbers 2 and 3.

Below the MATLAB Editor window, there are buttons for "Load Code", "Save Code", and "Close".

The background interface shows a menu bar with options: File, Vertical, Timebase, Trigger, Display, Cursors, Measure, Math, Analysis, Utilities, Help. The status bar at the bottom right shows the date and time: 9/26/2002 12:27:57 PM.

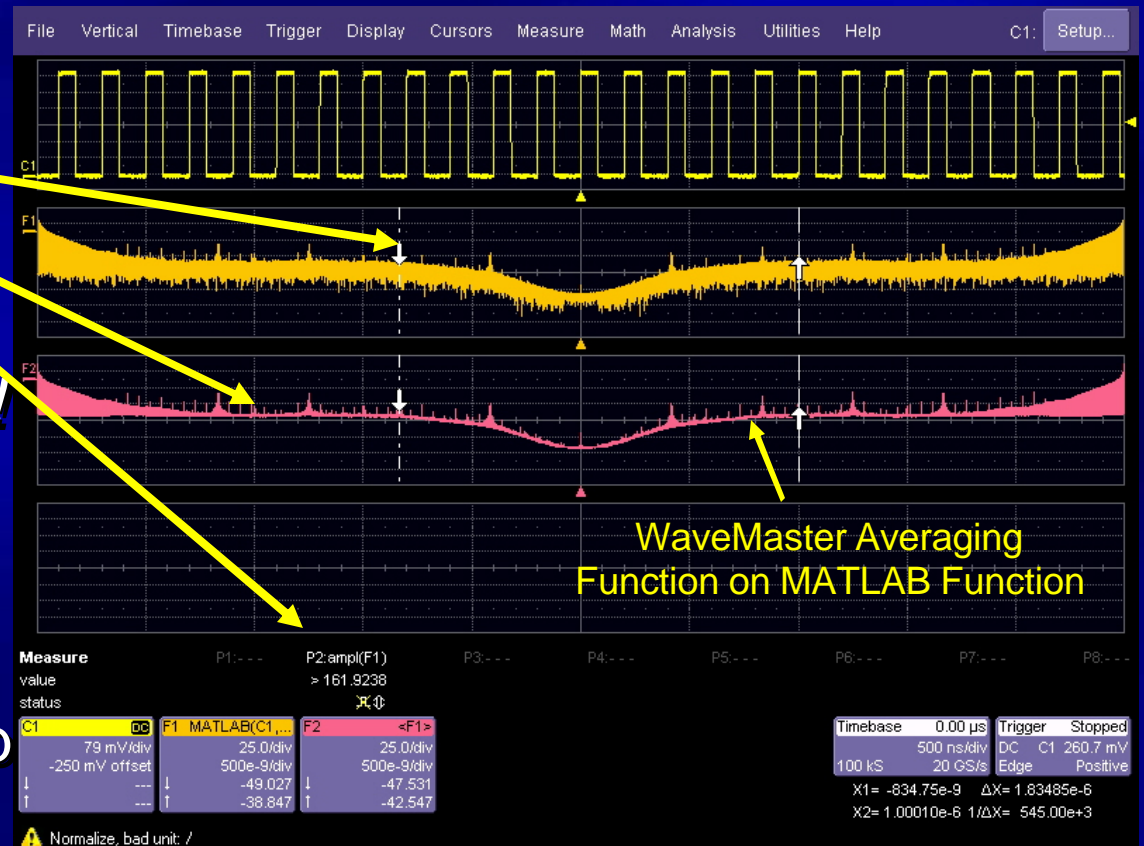
Step 4 – Turn on the F1 Trace, Result is Displayed in WaveMaster Program



Trace
Calculated in
MatLab and
Reimported
to
WaveMaster

The *Ultimate* in Flexibility!

- ✦ Processed trace can be measured with WaveMaster
 - ✦ Cursors
 - ✦ Functions
 - ✦ Parameters
- ✦ Implement your solution *immediately!*
- ✦ Shorten product time to market
- ✦ Fast Setup – no difficult remote communication setup
- ✦ Real-time trace display and update



Try This Example on Your WaveMaster

- You will need:
 - A WaveMaster with the XDEV or XMAP software options
 - A copy of MATLAB (Vs. 6.0 or later) installed on your WaveMaster
 - The *xdevdemo401.m* file (available on this web page)
 - Step-by-step instructions are in the *XDEV-MATLAB Intro* file (available on this web page)
 - Additional demonstration .m files may also be downloaded and used