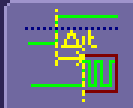
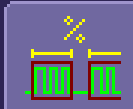
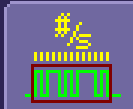
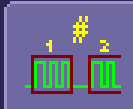
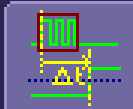
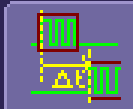
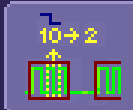
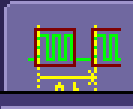


Select Measurement to Graph

Category

Choices

- All Measure
- CAN**
- Custom
- Disk Local
- Disk Standard
- Ethernet
- Horizontal
- IEC-EMC

Name	Description
 AnalogToCAN	CAN FD AnalogToMsg measure
 CANload	CAN FD bus load measure
 CANMsgBR	CAN FD message bitrate measure
 CANMsgNum	CAN FD number of message measure
 CANtoAnalog	CAN FD message to analog measure
 CANtoCAN	CAN FD message to message measure
 CANtoValue	CAN FD message to value measure
 DeltaCAN	CAN FD delta message measure








Math **F1**

Trace On

single **f(x)** dual **g(f(x))**

graph web edit

Summary

hist(freq(C3))

Actions for trace F1

 Measure
  Store
  Label
  Next
  Help Markers Simple

Scale / div 1.00

x 1.00 

 in  out

Scale / div 1.00


x 1.00 

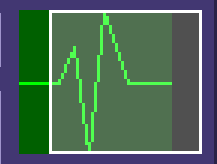
 in  out

 Reset Zoom

er **C2**

400 mV
Positive


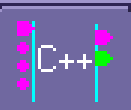
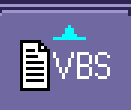


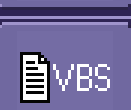
 Close



Select Measurement to Graph

- All Measure
- CAN
- Custom
- Disk Local
- Disk Standard
- Ethernet
- Horizontal
- IEC-EMC

Vertical scrollbar with up and down arrow buttons.

Choices	
Name	Description
 Excel param 0.00V	Perform Measurement in Excel. Transfers 1 or 2 waveforms and reads the resulting parameter value.
 Fast MultiW Port C++	using multiple inputs provides memory mapped file access for user-based computation of a waveform and/or parameter calculations
 HParam script VBS	Visual Basic (or Java) script which produces a measurement from one or two input histogram results
 Mathcad param 0.00V	Produces a parameter using a user specified Mathcad function
 MATLAB param 0.00v	Produces a parameter using a user specified MATLAB function
 Param script VBS	Visual Basic script which produces a measurement from one or two input waveforms

Footer area containing: a 2x2 grid of document icons, a list icon, a Cancel button, an up arrow button, and a down arrow button.

Select Measurement to Graph

Category

Choices

All Measure

CAN

Custom

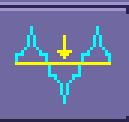

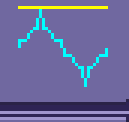
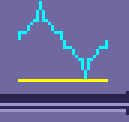

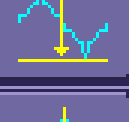
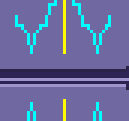
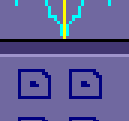
Disk Local

Disk Standard

Ethernet

Horizontal

IEC-EMC

Name	Description
 Local base	Value of the baseline for a local feature
 Local bsep	Local baseline separation, between rising and falling slopes
 Local max	Maximum value of a local feature
 Local min	Minimum value of a local feature
 Local number	Number of local features (peak / trough pairs)
 Local pkpk	Vertical difference between the peak and trough of a local feature; (Imax - Imin)
 Local t@max	Time of the maximum value of a local feature
 Local t@min	Time of the minimum value of a local feature



Cancel



Select Measurement to Graph

Category

Choices

All Measure

CAN

Custom

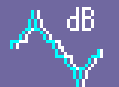

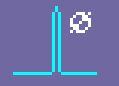

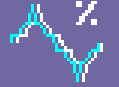


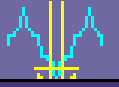
Disk Local

Disk Standard

Ethernet

Horizontal

IEC-EMC

Name	Description
 ACSN	Provides a signal-to-noise ratio for periodic waveforms
 Ampl asym	Amplitude asymmetry between averaged t_{aa+} and t_{aa-} ; $1 - (t_{aa+} - t_{aa-}) / (t_{aa+} + t_{aa-})$
 Nb phase	Provides a measurement of the phase at a specific frequency of a waveform (narrow band)
 Nb power	Provides a measurement of the power at a specific frequency of a waveform (narrow band)
 NLTS	Provides a measurement of the nonlinear transition shift for a prml signal
 Overwrite	Ratio of residual to original power of a low frequency waveform overwritten by a higher frequency
 PW50	Average pulse width at the 50% point between the local baseline and the local peak or trough
 PW50-	Average pulse width at the 50% point between the local baseline and the local trough



Cancel



Select Measurement to Graph

Category

Choices

All Measure

CAN

Custom

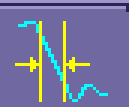
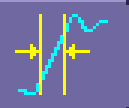
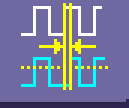
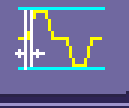
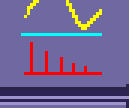



Disk Local

Disk Standard

Ethernet

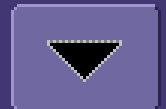
Horizontal

IEC-EMC

Name	Description
 100BT fall	Fall time between 2 levels (upper-base; base-lower) of a 3 levels signal (100BT)
 100BT rise	Rise time between 2 levels (Lower-base; base-upper) of a 3 levels signal (100BT)
 100BT TIE	Difference between the measured and ideal times at level between base and upper or lower levels of 100BT signal.
 100BT Tj	Total jitter from a TIE at level between base and upper or lower levels of 100BT signal.
 10BTHCInt	Accepts FFT result as input, calculates whether harmonics of 10Base-T signal are within spec
 10BTJ	10BaseT output timing jitter
 DOV	Differential Output Voltage of a 100 Base T
 Droop FG	1000 Base-T test mode 1 droop from F to G



Cancel



Select Measurement to Graph

Category

Choices

All Measure

CAN

Custom


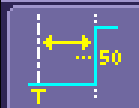
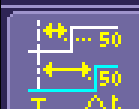
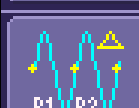
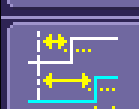

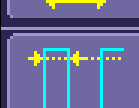
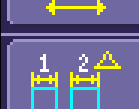
Disk Local

Disk Standard

Ethernet

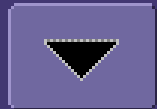
Horizontal

IEC-EMC

Name	Description
 Cycles	Number of cycles in a periodic waveform
 Delay	Time from the trigger to the first transition at the 50% crossing
 Delta delay	Time between the 50% crossing of first transition of two waveforms
 Dperiod@level	Adjacent cycle deviation (cycle to cycle jitter) of each cycle in a waveform
 Dtime@level	Time between selectable levels for 2 waveforms
 Duty cycle	Percent of time data is above 50%
 Duty@level	Percent of period for which data are above or below a specified level
 Dwidth@level	Difference of adjacent width above or below a specified level



Cancel



Select Measurement to Graph

Category

Choices

All Measure

CAN

Custom

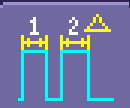


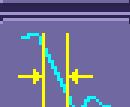
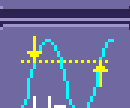


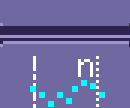
Disk Local

Disk Standard

Ethernet

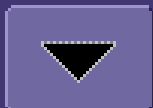
Horizontal

IEC-EMC

Name	Description
 Dwidth@level	Difference of adjacent width above or below a specified level
 Edge@level	Number of edges in waveform
 EdgeToEdge	delta time from some edge on first source to some (other) edge on second source.
 Fall time	Duration of falling edge from 90-10%
 Freq@level	Frequency at a specific level and slope for every cycle in waveform
 Frequency	Frequency for every cycle in waveform at the 50% level and positive slope
 Hold time	Time from the clock edge to the data edge
 Num points	Number of points displayed



Cancel

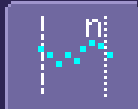
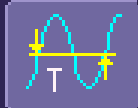
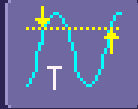

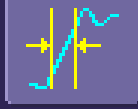
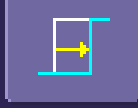

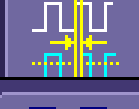


Select Measurement to Graph

Category

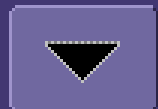
- All Measure
- CAN
- Custom
- Disk Local
- Disk Standard
- Ethernet
- Horizontal**
- IEC-EMC

Choices

Name	Description
 Num points	Number of points displayed
 Period	Period for every cycle in waveform at the 50% level and positive slope
 Period@level	Period at a specific level and slope for every cycle in waveform
 Phase	Calculate the phase difference between two edges
 Rise time	Duration of rising edge from 10-90%
 Setup	Time from the data edge to the clock edge
 Skew	Time of clock1 edge minus time of nearest clock2 edge
 TIE@level	Difference between the measured times of crossing a given slope and level and the ideal expected time



Cancel



Select Measurement to Graph

Category

Choices

All Measure

CAN

Custom

Disk Local

Disk Standard

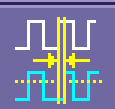
Ethernet

Horizontal

IEC-EMC

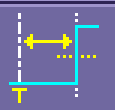
Name

Description



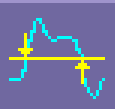
TIE@level

Difference between the measured times of crossing a given slope and level and the ideal expected time



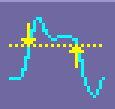
Time@level

Time from trigger of each transition at a specific level and slope



Width

Width measured at the 50% level and positive slope



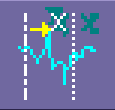
Width@level

Width measured at a specific level



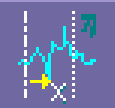
WidthN

Width measured at the 50% level and negative slope



X@max

Horizontal position of all local maxima, or of simple maximum value.



X@min

Horizontal position of all local minima, or of simple minimum value



Cancel

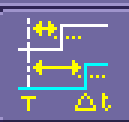
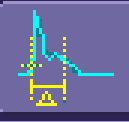
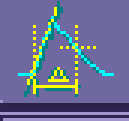
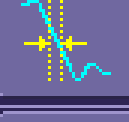
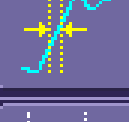
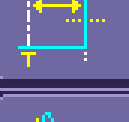
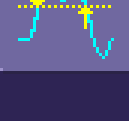


Select Measurement to Graph

Category

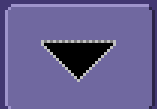
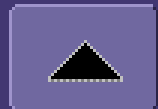
- Horizontal
- IEC-EMC**
- Jitter
- Misc
- NRZ
- Optical Recording
- Power Measure
- Pulse

Choices

Name	Description
 Dtime@level	Time between selectable levels for 2 waveforms
 EMCtMPulse	EMC level after pulse param calculator
 EMCt2Val	EMC time to half value param calc
 Fall@level	Duration of falling edge between user defined levels
 Rise@level	Duration of rising edge from user defined transitions
 Time@level	Time from trigger of each transition at a specific level and slope
 Width@level	Width measured at a specific level



Cancel



Select Measurement to Graph

Category

Choices

Horizontal

IEC-EMC

Jitter

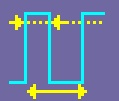

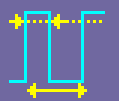
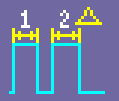



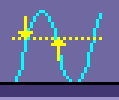
Misc

NRZ

Optical
Recording

Power
Measure

Pulse

Name	Description
 DCD	Amount of jitter due to duty cycle distortion
 Dperiod@level	Adjacent cycle deviation (cycle to cycle jitter) of each cycle in a waveform
 Duty@level	Percent of period for which data are above or below a specified level
 Dwidth@level	Difference of adjacent width above or below a specified level
 Edge@level	Number of edges in waveform
 EdgeToEdge	delta time from some edge on first source to some (other) edge on second source.
 Freq@level	Frequency at a specific level and slope for every cycle in waveform
 Half period	Half period of a waveform



Cancel



Select Measurement to Graph

Category

Choices

Horizontal

IEC-EMC

Jitter


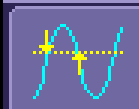
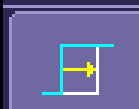
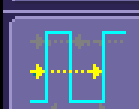
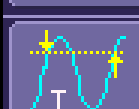
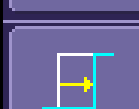

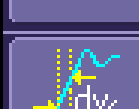
Misc

NRZ

Optical Recording

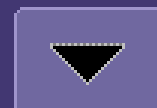
Power Measure

Pulse

Name	Description
 Freq@level	Frequency at a specific level and slope for every cycle in waveform
 Half period	Half period of a waveform
 Hold time	Time from the clock edge to the data edge
 N cycle jitter	Peak to peak jitter between edges spaced $n \cdot UI$
 Period@level	Period at a specific level and slope for every cycle in waveform
 Setup	Time from the data edge to the clock edge
 Skew	Time of clock1 edge minus time of nearest clock2 edge
 Slew rate	Slew rate or local dw/dt in a transition zone



Cancel



Select Measurement to Graph

Category

Choices

Horizontal

IEC-EMC

Jitter

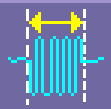


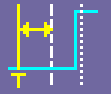

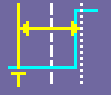


Misc

NRZ

Optical Recording

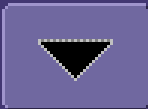
Power Measure

Pulse

Name	Description
 Burst Width	Analyse OOB burst widths as per SATA and SAS standards
 Dtrig time	Time from last trigger to this trigger
 Duration	Time from first to last acquisition included in average, histogram or sequence
 First	Horizontal position of left-most sample within measure gate
 Gap Width	Analyse OOB gap widths as per SATA and SAS standards
 Last	Horizontal position of right-most sample within measure gate
 Num points	Number of points displayed
 tUpS	Upsamples a time parameter by nX



Cancel

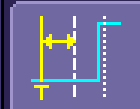
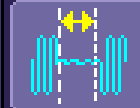



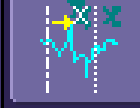
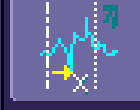


Select Measurement to Graph

Category

Choices

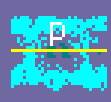
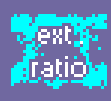
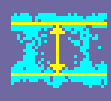

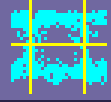


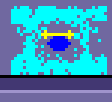
- Horizontal
- IEC-EMC
- Jitter
- Misc
- NRZ
- Optical Recording
- Power Measure
- Pulse

Name	Description
 First	Horizontal position of left-most sample within measure gate
 Gap Width	Analyse OOB gap widths as per SATA and SAS standards
 Last	Horizontal position of right-most sample within measure gate
 Num points	Number of points displayed
 tUpS upS xN	Upsamples a time parameter by nX
 X@max	Horizontal position of all local maxima, or of simple maximum value.
 X@min	Horizontal position of all local minima, or of simple minimum value

Navigation controls including a grid icon, a list icon, a Cancel button, and up/down arrow buttons.

Select Measurement to Graph

- Misc
- NRZ**
- Optical Recording
- Power Measure
- Pulse
- RZ
- Serial Decode
- Statistics

Choices	
Name	Description
 Avg Power	Average power of the waveform
 Ext Ratio	Ratio of the power levels of an eye diagram
 Eye Amplitude	Difference of the levels of an eye diagram
 Eye BER	Bit Error Rate estimated from an eye diagram
 Eye Crossing	Level of the crossing in an eye diagram
 Eye Height	Size of the vertical opening of an eye diagram
 Eye Min	Minimum of a level of an eye diagram
 Eye Opening	The opening time at the Vdiff AC min (as defined for MIPI M-PHY)

Navigation controls: four document icons, a list icon, a Cancel button, and two arrow buttons.

Select Measurement to Graph

Category

Choices

Misc

NRZ

Optical
Recording

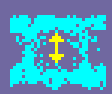
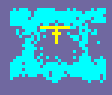
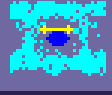

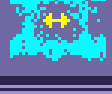
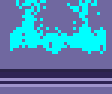
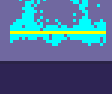
Power
Measure

Pulse

RZ

Serial
Decode

Statistics

Name	Description
 Eye Height	Size of the vertical opening of an eye diagram
 Eye Min	Minimum of a level of an eye diagram
 Eye Opening	The opening time at the Vdiff AC min (as defined for MIPI M-PHY)
 Eye Q Factor	Q factor measured within the eye aperture
 Eye Width	Size of the horizontal opening of an eye diagram
 One Level	One level of an eye diagram
 Zero Level	Zero level of an eye diagram








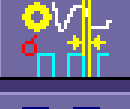


Cancel



Select Measurement to Graph

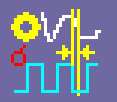

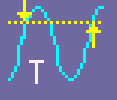

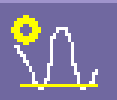



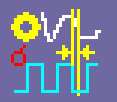

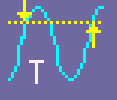

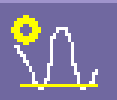



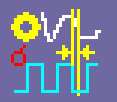

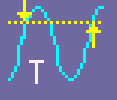

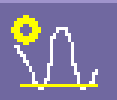



- NRZ
- Optical Recording**
- Power Measure
- Pulse
- RZ
- Serial Decode
- Statistics
- StdHoriz Histogram

Choices	
Name	Description
 BEES	Measures both BES and EES for the sequence of pits (xT nT xT)
 BES	Measures the leading edge shift of a pit when it's preceded by a specified space
 BESS	Sigma of times of beginning edge shift
 Dp2c	Time between the leading pit or space edges and the next clock edge
 Dp2cs	Sigma of times from pit edge to nearest clock edge
 Edgsh	The mean value of the difference between pit or space widths and their ideal widths
 EES	Measures the trailing edge shift of a pit when it's followed by a specified space
 EESS	Sigma of times of ending edge shift

Navigation and Action Buttons:

- Four small square icons in a 2x2 grid (top-left, top-right, bottom-left, bottom-right).
- Cancel button.
- Up arrow button.
- Down arrow button.

Select Measurement to Graph

Category	Choices																		
Optical Recording	<table border="1"><thead><tr><th>Name</th><th>Description</th></tr></thead><tbody><tr><td> EESS</td><td>Sigma of times of ending edge shift</td></tr><tr><td> PAA</td><td>Average amplitude of pits in a waveform</td></tr><tr><td> Period@level</td><td>Period at a specific level and slope for every cycle in waveform</td></tr><tr><td> Pit asym</td><td>(diff in middle voltage of largest & smallest "nT" width pits) / (amplitude of largest "nT" width pits)</td></tr><tr><td> Pit base</td><td>Value for the base level of a space</td></tr><tr><td> Pit max</td><td>Maximum value of a pit</td></tr><tr><td> Pit middle</td><td>Midpoint between the top and base of pits</td></tr><tr><td> Pit minimum</td><td>Minimum value of a space</td></tr></tbody></table>	Name	Description	 EESS	Sigma of times of ending edge shift	 PAA	Average amplitude of pits in a waveform	 Period@level	Period at a specific level and slope for every cycle in waveform	 Pit asym	(diff in middle voltage of largest & smallest "nT" width pits) / (amplitude of largest "nT" width pits)	 Pit base	Value for the base level of a space	 Pit max	Maximum value of a pit	 Pit middle	Midpoint between the top and base of pits	 Pit minimum	Minimum value of a space
	Name	Description																	
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	 Pit max	Maximum value of a pit																	
	 Pit middle	Midpoint between the top and base of pits																	
	 Pit minimum	Minimum value of a space																	
NRZ																			
Power Measure																			
Pulse																			
RZ																			
Serial Decode																			
Statistics																			
StdHoriz Histogram																			




Navigation buttons: Cancel, Up, Down

Select Measurement to Graph

Category

Choices

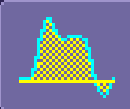
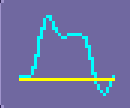
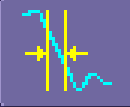
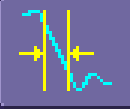
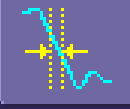
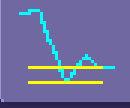
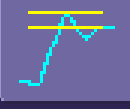
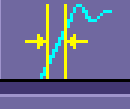
- NRZ
- Optical Recording
- Power Measure**
- Pulse
- RZ
- Serial Decode
- Statistics
- StdHoriz Histogram

Name	Description
 Apparent pwr	product of the RMS values of the voltage and current
 Power factor	Ratio of real to apparent power
 Real power	mean of the product of voltage and current waveform (or mean of the instantaneous power)

Navigation controls: four small square icons, a "Cancel" button, and two large triangular arrow buttons (up and down).

Select Measurement to Graph

- NRZ
- Optical Recording
- Power Measure
- Pulse**
- RZ
- Serial Decode
- Statistics
- StdHoriz Histogram

Choices	
Name	Description
 Area	Calculate the area of a waveform
 Base	Value of most probable lower state in a bimodal waveform
 Fall 80-20%	Duration of falling edge from 80-20%
 Fall time	Duration of falling edge from 90-10%
 Fall@level	Duration of falling edge between user defined levels
 Overshoot-	Overshoot following a falling edge; $100\% * (\text{base} - \text{min}) / (\text{top} - \text{base})$
 Overshoot+	Overshoot following a rising edge; $100\% * (\text{max} - \text{top}) / (\text{top} - \text{base})$
 Rise 20-80%	Duration of rising edge from 20-80%

Navigation and control buttons: Copy, Paste, List, Cancel, Up Arrow, Down Arrow

Select Measurement to Graph

Category

Choices

NRZ

Optical
Recording

Power
Measure

Pulse

RZ

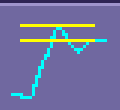
Serial
Decode

Statistics

StdHoriz
Histogram

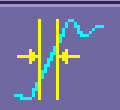
Name

Description



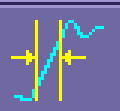
Overshoot+

Overshoot following a rising edge; $100\% * (\text{max} - \text{top}) / (\text{top} - \text{base})$



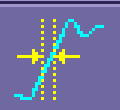
Rise 20-80%

Duration of rising edge from 20-80%



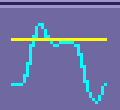
Rise time

Duration of rising edge from 10-90%



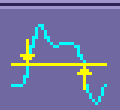
Rise@level

Duration of rising edge from user defined transitions



Top

Value of most probable higher state in a bimodal waveform



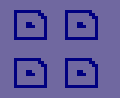
Width

Width measured at the 50% level and positive slope



WidthN

Width measured at the 50% level and negative slope



Cancel



Select Measurement to Graph

Category

Choices

NRZ

Optical Recording

Power Measure

Pulse

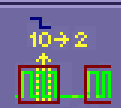


RZ

Serial Decode

Statistics

StdHoriz Histogram



Name	Description
 ColToValue	Extract a Serial Decode Table Column into ParamResult. No transformation of value
 DigRFV4Param	DigRV V4 parameters, input Decode table
 I2SToValue	Translates data bytes of audio sample into values



Cancel



Select Measurement to Graph

Category

Choices

Pulse

RZ

Serial
Decode

Statistics

StdHoriz
Histogram

StdVert
Histogram

Vertical

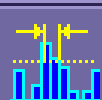
Name

Description



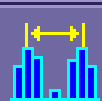
FWHM

Measures the width of the largest area histogram peak at half of the population of the highest peak



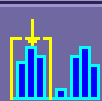
FWHxx

Measures the width of the largest area histogram peak at xx% of the population of the highest peak



Hist ampl

Difference in value of the two most populated peaks in a histogram



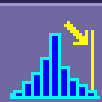
Hist base

Value of the left-most of the two most populated histogram peaks



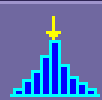
Hist max pop

Peak with maximum population in a histogram



Hist maximum

Value of the highest (right-most) populated bin in a histogram



Hist mean

Average or mean value of data in histogram



Hist median

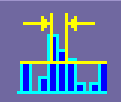
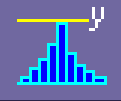

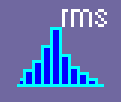
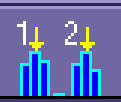
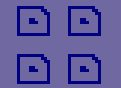


Value of the 'x' axis of a histogram that divides the population into two equal halves



Cancel



Select Measurement to Graph

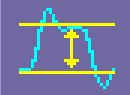
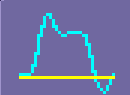

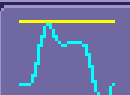
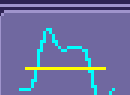
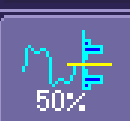
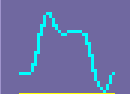
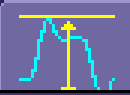
Category	Choices
Pulse	 FWHM Measures the width of the largest area histogram peak at half of the population of the highest peak
	 Hist max pop Peak with maximum population in a histogram
	 Hist mean Average or mean value of data in histogram
	 Hist range Calculate range (max-min) of a histogram
	 Hist rms Root mean square of the values in a histogram
	 Hist sdev Standard deviation of values in a histogram
	 None Disable parameter calculation
	 Peaks Number of peaks in a histogram
	
	
	
	

Select Measurement to Graph

Category

- Pulse
- RZ
- Serial Decode
- Statistics
- StdHoriz Histogram
- StdVert Histogram
- Vertical**

Choices

	Name	Description
	Amplitude	Difference between top and base in a bimodal signal. If not bimodal, difference between max and min
	Base	Value of most probable lower state in a bimodal waveform
	Level@X	Level measured at specific X position
	Maximum	Highest value in input waveform
	Mean	Average of data values
	Median	Data value for which 50% are above and 50% are below
	Minimum	Lowest value in input waveform
	Peak to peak	Difference between maximum and minimum data values

Navigation and control buttons: a 2x2 grid of square buttons, a list icon, a Cancel button, and two large triangular arrow buttons.

Select Measurement to Graph

Category

Choices

Pulse

RZ

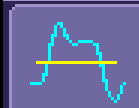
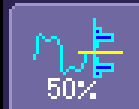
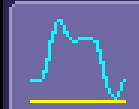
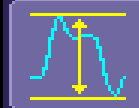


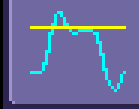
Serial Decode

Statistics

StdHoriz Histogram

StdVert Histogram

Vertical

Name	Description
 Mean	Average of data values
 Median	Data value for which 50% are above and 50% are below
 Minimum	Lowest value in input waveform
 Peak to peak	Difference between maximum and minimum data values
 RMS	Root mean square of the data
 Std dev	Standard deviation of the data
 Top	Value of most probable higher state in a bimodal waveform



Cancel



Select Graph Function

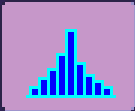
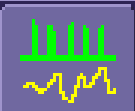

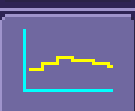

Category

Choices

All
Functions

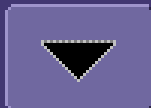
Graphing

Jitter
Functions

	Name	Description
	Histogram	Histogram of the values of a parameter
	I2S to Wform	Generate an analog Audio waveform from a I2S decode table
	Track	Track of the values of a parameter
	Trend	Trend of the values of a parameter
	Trk	Track of parameter values with alternate transition types



Cancel



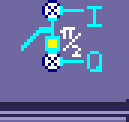

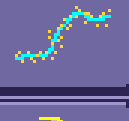
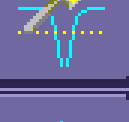
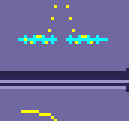
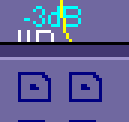


Select Math Operator

Category

Choices

- All Functions
- Basic Math
- Custom
- Filter**
- Frequency Analysis
- Functions
- Graphing
- Jitter Functions

Name	Description
 Boxcar $C_k = 1/N$	Rectangular BoxCar filter (local running average) of specified length
 CTLE	simple Continuous Time Linear Equalizer: 2 poles, one zero. Default settings are for USB 3 CTLE.
 Demodulate	AM, FM or PM demodulation of input
 Maui class LeCroy Enet HPF	Single pole high pass filter, required by Gigabit Ethernet test modes 1, 2 and 3, and by BroadR-Reach test mode 4, distortion.
 Eres	Noise reduction and smoothing filter specified by number of extra bits
 Filter	Processes waveform using specified digital filter
 Interpolate	SinXX, cubic, and linear interpolation (upsampling)
 LpIIR	IIR simple lowpass filters (Butterworth or Chebyshev type 1)

Navigation and control buttons: a 2x2 grid of document icons, a list icon, a Cancel button, and two arrow buttons (up and down).

Select Math Operator

Category

Choices

All Functions

Basic Math

Custom

Filter

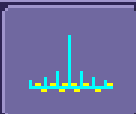

Frequency Analysis

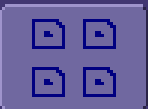
Functions

Graphing

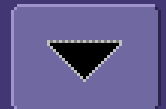
Jitter Functions



Name	Description
 FFT	Fast Fourier Transform of waveform data
 Spectrogram	Waveform Spectrogram



Cancel



Select Math Operator

Category

Choices

All Functions

Basic Math

Custom


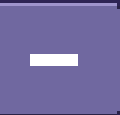
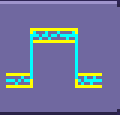
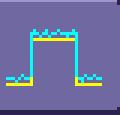



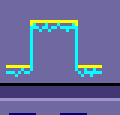
Filter

Frequency Analysis

Functions

Graphing

Jitter Functions

Name	Description
 Average	Averages the input
 Difference	Subtract input 2 from input 1
 Envelope	Highest and lowest Y values at each X in N sweeps
 Floor	Lowest Y value at each X in N sweeps
 Invert	Inversion (negation) of input waveform
 Product	Product of two waveform inputs
 Ratio	Ratio of input 1 to input 2
 Roof	Highest Y value at each X in N sweeps



Cancel



Select Math Operator

Category

Choices

All Functions

Basic Math

Custom



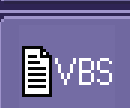
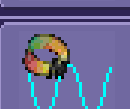

Filter

Frequency Analysis

Functions

Graphing

Jitter Functions





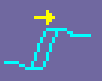







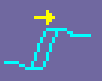







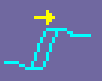



Name	Description
 Excel math	Perform Math in Excel. Transfers 1 or 2 waveforms into Excel and reads the resulting waveform.
 C++ Fast Wave Port	Produces a waveform using a user specified function
 Math script VBS	Visual Basic script which produces a waveform from one or two input waveforms
 Mathcad math	Produces a waveform using a user specified Mathcad function
 MATLAB math	Produces a waveform using a user specified MATLAB function



Cancel



























Select Math Operator

Category	Choices																		
All Functions	<table border="1"><thead><tr><th>Name</th><th>Description</th></tr></thead><tbody><tr><td> Absolute</td><td>Waveform absolute value</td></tr><tr><td> Correlation</td><td>Correlation of 2 waveforms</td></tr><tr><td> CTLE</td><td>simple Continuous Time Linear Equalizer: 2 poles, one zero. Default settings are for USB 3 CTLE.</td></tr><tr><td> Derivative</td><td>Derivative of adjacent samples</td></tr><tr><td> Deskew</td><td>Deskew waveform by shifting it in time</td></tr><tr><td> Exp</td><td>Exponential (power of e) of the waveform</td></tr><tr><td> Exp10</td><td>Exponential (power of 10) of the waveform</td></tr><tr><td> Integral</td><td>Integral of the linearly rescaled (multiplier and adder) input</td></tr></tbody></table>	Name	Description	 Absolute	Waveform absolute value	 Correlation	Correlation of 2 waveforms	 CTLE	simple Continuous Time Linear Equalizer: 2 poles, one zero. Default settings are for USB 3 CTLE.	 Derivative	Derivative of adjacent samples	 Deskew	Deskew waveform by shifting it in time	 Exp	Exponential (power of e) of the waveform	 Exp10	Exponential (power of 10) of the waveform	 Integral	Integral of the linearly rescaled (multiplier and adder) input
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Basic Math																			
Custom																			
Filter																			
Frequency Analysis																			
Functions																			
Graphing																			
Jitter Functions																			

Navigation: Cancel, Up Arrow, Down Arrow

Select Math Operator

Category	Choices																		
Functions	<table border="1"><thead><tr><th>Name</th><th>Description</th></tr></thead><tbody><tr><td> Integral</td><td>Integral of the linearly rescaled (multiplier and adder) input</td></tr><tr><td> Invert</td><td>Inversion (negation) of input waveform</td></tr><tr><td> Ln</td><td>Natural log of input waveform values</td></tr><tr><td> Log10</td><td>Log base 10 of waveform</td></tr><tr><td> LpIIR</td><td>IIR simple lowpass filters (Butterworth or Chebyshev type 1)</td></tr><tr><td> Reciprocal</td><td>Reciprocal of the input waveform</td></tr><tr><td> Rescale</td><td>Scale the waveform ($Y = aX + b$)</td></tr><tr><td> Square</td><td>Square of the input waveform</td></tr></tbody></table>	Name	Description	 Integral	Integral of the linearly rescaled (multiplier and adder) input	 Invert	Inversion (negation) of input waveform	 Ln	Natural log of input waveform values	 Log10	Log base 10 of waveform	 LpIIR	IIR simple lowpass filters (Butterworth or Chebyshev type 1)	 Reciprocal	Reciprocal of the input waveform	 Rescale	Scale the waveform ($Y = aX + b$)	 Square	Square of the input waveform
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All Functions																			
Basic Math																			
Custom																			
Filter																			
Frequency Analysis																			
Jitter Functions																			
Graphing																			

Navigation: [Up Arrow] [Down Arrow] [Home] [List Icon] [Cancel] [Up Arrow] [Down Arrow]

Select Math Operator

Category

Choices

Basic Math

Custom

Filter


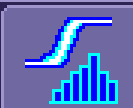
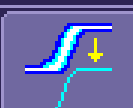


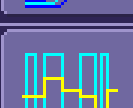

Frequency Analysis

Functions

Graphing

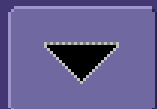
Jitter Functions

Misc

Name	Description
 ISIPatt	Uses TIE and associated waveform to construct ISI diagram which can be eye-like
 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
 Track	Track of the values of a parameter
 Trk	Track of parameter values with alternate transition types



Cancel



Select Math Operator

Category

Choices

Filter

Frequency
Analysis

Functions

Graphing

Jitter
Functions

Misc

Special
Math

Name

Description



Copy

Creates complete copy of waveform in memory, eliminating re-calculation but increasing memory usage



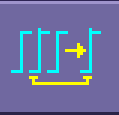
ISIPatt

Uses TIE and associated waveform to construct ISI diagram which can be eye-like



Reframe

reframes floating point waveforms which have dynamic range problems



Segment

Selects 1 segment from a sequence waveform



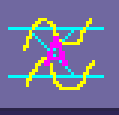
Seq Average

Averages sequence waveforms, segment by segment



Sparse

Produces a waveform with fewer points than the input waveform by decimating



SyncN

Synchronize HorPos of N waveforms



Cancel



Select Math Operator

Category

Choices

Filter

Frequency Analysis



Functions

Graphing

Jitter Functions

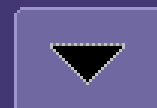
Misc

Special Math

Name	Description
 TIE	Htie to BER Extrapolate Histogram of TIE into a BER curve
 Slice2Persist	Resynchronize large waveform into a persistence map



Cancel



C1

C2

C3

C4

F1

F2

F3

F4

F5

F6

F7

F8

Z1

Z2

Z3

F1

^

≡

v

Web Editor Math Measure

Add Processing Nodes

- Add Math: Add new math component to the processing web
- Add Measure: Add new measurement to the processing web
- Add Param Math: Add new parameter math to the processing web

Add Preview: Previewed nodes appear only in the Web Editor.

Delete

Source Filter Close

Enable/Disable Input Sources

- Channels
- Measure
- Math
- Zoom
- Memory

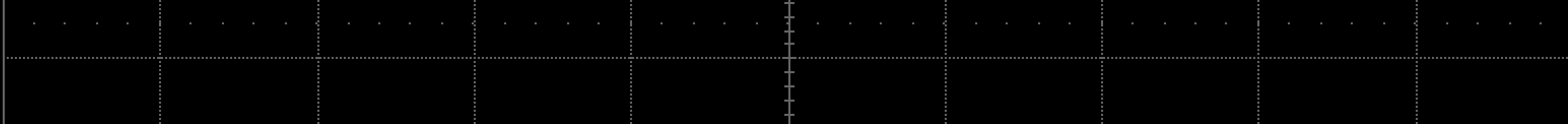


Timebase	0 μ s	Trigger	C2
	200 μ s/div	Auto	400 mV
1.00 MS	500 MS/s	Edge	Positive

Serial Decode Decode Setup Measure/Graph Setup FlexRay Phy Close

	Decode	Protocol					
Decode 1	<input type="checkbox"/> On	CAN FD	C1				Setup...
Decode 2	<input type="checkbox"/> On	RS232	C1				Setup...
Decode 3	<input type="checkbox"/> On	Audio-RJ	C1	C2	C3		Setup...
Decode 4	<input type="checkbox"/> On	I2C	C1	C2			Setup...

Link To Trigger



Timebase	0 μ s	Trigger	
	200 μ s/div	Auto	400 mV
1.00 MS	500 MS/s	Edge	Positive

PowerMeasure

Voltage

Current

Close

Analysis

Off

Device

Modulation

Line Power

Measurements

View

Measure Setup...

Grid

Auto

Single

Dual

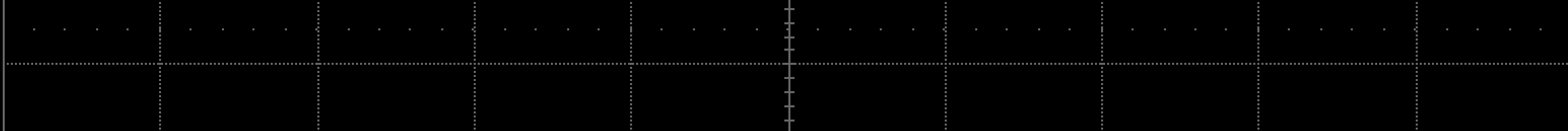
Quad

Octal

XY

XYSingle

XYDual



Timebase	0 μ s	Trigger	
	200 μ s/div	Auto	400 mV
1.00 MS	500 MS/s	Edge	Positive

USB Test Wizard USB Signal Quality USB Signal Quality 2

Close

Mode	Test
Device	FS Upstream Signal Quality
Tier	Result File Name
6	SigQual.tsv <input type="button" value="Browse"/>



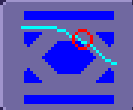
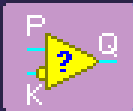
Step 1 of 4: Test Fixture Hookup

1. Connect the DUT to J20 in the Inrush section using a 5m cable.
2. Set Inrush switch to Device ON.
3. Connect a certified FS device to J27 in the Trigger section.
4. Connect the host port to a HS hub using a 5m cable.
5. Connect a FS hub to port 1 of the HS hub using a 5m cable.
6. Connect a chain of 3 hubs to the FS hub port 1 using 5m cables.
7. Connect ports 1 and 2 to the Inrush and Trigger sections using short cables.
8. Push Next to connect the probes.

Category

Choices

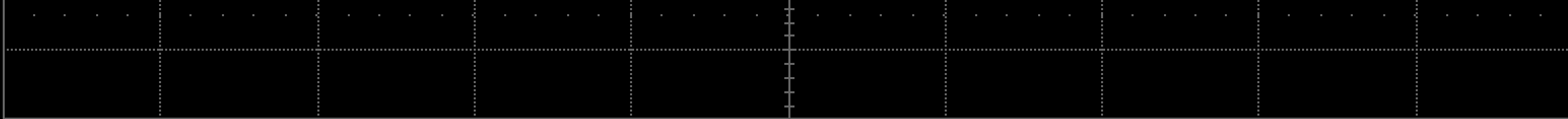
PassFail
Condition

	Name	Description
	Bool identity	boolean identity
	Dual Param Compare	Compare two parameter values
	Mask test	Mask testing
	Param compare	Compare parameter value against limit(s)



Cancel





Timebase 0.00 μ s
400 kS 2.00 μ s/div 20 GS/s

Trigger C2
Auto 400 mV
Edge Positive

Ethernet tests

Mask Tests

Fixture Calibration

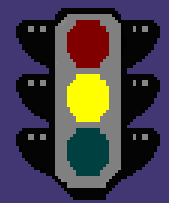
Close

Select Standard

- Off
- 10Base-T
- 100Base-TX
- 1000Base-T

Select Test

- Mode 1 Transmit Wform
- Average Result
- Avg Weight 31



Differential Data on 2 Channels

Set Up and Start Test

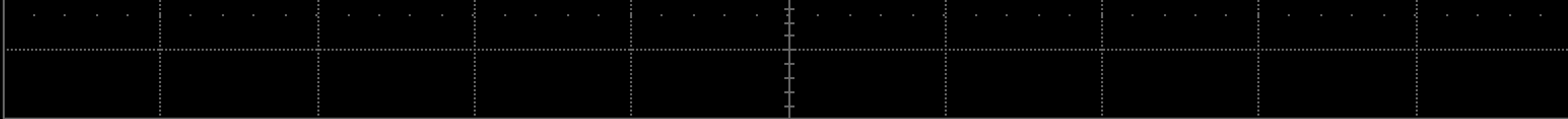
Source for + Data C1

Source for - Data C1

Set Trigger on Data Src

Disturber Present

Mode 1 - Transmit template & droop (as described in IEEE Std 802.3, 40.6.1.1 and 40.6.1.2). Please connect the DSO to the differential signal of the Transmitter using the 1000BT Template Tests section of TF-ENET-B. The test signal is spec'd in IEEE Std 802.3, 40.6.1.1.2.



Timebase 0.00 μ s
400 kS 2.00 μ s/div 20 GS/s
Trigger C2
Auto 400 mV
Edge Positive

MIPI M-PHY

Views

Mphy1

Mphy2

Mphy3

Mphy4

Mphy5

Mphy6

Mphy7

Mphy8

Close

Enable



Mode

HS

Probing

Ddiff

Show Decode



Ddiff

C1

Show Stat



Setup Acquisition



Mphy1

V DIF-P DC



Mphy5

V DIF-P AC MIN



Mphy2

V DIF-N DC



Mphy6

V DIF-N AC MAX



Mphy3

T EYE OPEN



Mphy7

V DIF-N AC MIN



Mphy4

V DIF-P AC MAX



Mphy8

Rise

CDR

Linear

Bit Rate

1.24800 Gbit/s

Find Bit Rate



Timebase	0.00 μ s	Trigger	C2
	2.00 μ s/div	Auto	400 mV
400 kS	20 GS/s	Edge	Positive

Display Persistence per Trace Monitor

Close

Persistence On



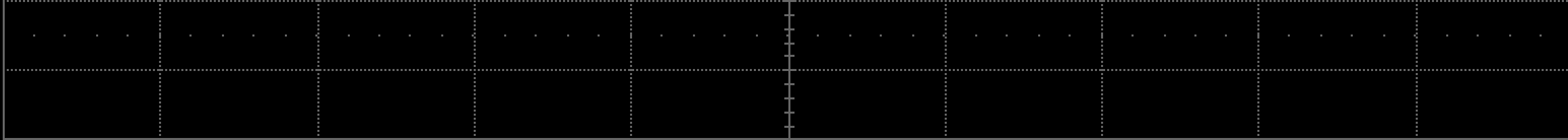
All Locked

Per Trace

Clear Sweeps

Reset All

---				3d	---				3d
---				3d	---				3d
---				3d	---				3d
---				3d	---				3d



Timebase	0.00 μ s	Trigger	C2
	2.00 μ s/div	Auto	400 mV
400 kS	20 GS/s	Edge	Positive

Close

Display Persistence per Trace Monitor

Auto	Single	Dual	Quad
Octal	XY	XYSingle	XYDual
Tandem	Quattro	PCIE	

Grid

Grid Intensity
40 %

Grid on Top

Axis Labels

Trace

Line Points

XY

Input X
C1

Input Y
C2

Sequence

Display Mode
Adjacent

Num Seg Displayed
10

Starting at
1