Standard

Math Tools

Display up to four math function traces (F1-F4). The easy-to-use graphical interface simplifies setup of up to two operations on each function trace; and function traces can be chained together to perform math-on-math.

absolute value integral average (summed) invert (negate) average (continuous) log (base e) custom (MATLAB) - limited points product (x) derivative ratio (/) deskew (resample) reciprocal difference (-) rescale (with units) enhanced resolution (to 11 bits vertical) roof envelope (sinx)/x exp (base e) sauare exp (base 10) square root fft (power spectrum, magnitude, phase, sum (+)

up to 50 kpts) trend (datalog) of 1000 events loor zoom (identity)

histogram of 1000 events

Measure Tools

Display any 6 parameters together with statistics, including their average, high, low, and standard deviations. Histicons provide a fast, dynamic view of parameters and wave-shape characteristics.

risetime (10-90% amplitude frequency 20-80%, @ level) area last level @ x base std. deviation cycles maximum custom (MATLAB, time @ level mean VBScript) median limited points Δ time @ level minimum delay Δ time @ level from number of points Δ delay trigger +overshoot width (positive + duration -overshoot negative) duty cycle peak-to-peak x@ max. falltime (90-10%). period 80-20%, @ level) x@ min.

first

Pass/Fail Testing

Simultaneously test multiple parameters against selectable parameter limits or pre-defined masks. Pass or fail conditions can initiate actions including document to local or networked files, e-mail the image of the failure, save waveforms, send a pulse out at the rear panel auxiliary BNC output, or (with the GPIB option) send a GPIB SRQ.

Jitter and Timing Analysis Software Package (WRXi-JTA2) (Standard with MXi-A model oscilloscopes)

• Jitter and timing parameters, with "Track" graphs of

phase

- Cycle-Cycle Jitter - Period - Hold
- N-Cycle - Half Period - Skew
- N-Cycle with start selection - Time Interval Error - Duty Cycle Error
- Frequency - Setup

- Edge@lv parameter (counts edges)
- Persistence histogram, persistence trace (mean, range, sigma)

Software Options - Advanced Math and WaveShape Analysis

Statistics Package (WRXi-STAT)

This package provides additional capability to statistically display measurement information and to analyze results:

- Histograms expanded with 19 histogram parameters/up to 2 billion events.
- Persistence Histogram
- Persistence Trace (mean, range, sigma)

Master Analysis Software Package (WRXi-XMAP)

(Standard with MXi-A model oscilloscopes)

This package provides maximum capability and flexibility, and includes all the functionality present in XMATH, XDEV, and JTA2.

Advanced Math Software Package (WRXi-XMATH)

(Standard with MXi-A model oscilloscopes)

This package provides a comprehensive set of WaveShape Analysis tools providing insight into the wave shape of complex signals. Includes:

- Parameter math add, subtract, multiply, or divide two different parameters. Invert a parameter and rescale parameter values.
- Histograms expanded with 19 histogram parameters/up to 2 billion events.
- Trend (datalog) of up to 1 million events
- Track graphs of any measurement parameter
- FFT capability includes: power averaging, power density, real and imaginary components, frequency domain parameters, and FFT on up to 24 Mpts.
- Narrow-band power measurements
- Auto-correlation function
- Sparse function
- Cubic interpolation function

Advanced Customization Software Package (WRXi-XDEV) (Standard with MXi-A model oscilloscopes)

This package provides a set of tools to modify the scope and customize it to meet your unique needs. Additional capability provided by XDEV includes:

- Creation of your own measurement parameter or math function, using third-party software packages, and display of the result in the scope.
 Supported third-party software packages include:
 - VBScript MATLAB Excel
- CustomDSO create your own user interface in a scope dialog box.
- Addition of macro keys to run VBScript files
- Support for plug-ins

Value Analysis Software Package (WRXi-XVAP)

(Standard with MXi-A model oscilloscopes)

Measurements:

• Jitter and Timing parameters (period@level, width@level, edge@level, duty@level, time interval error@level, frequency@level, half period, setup, skew, Δ period@level, Δ width@level).

Math

- Persistence histogram Persistence trace (mean, sigma, range)
- 1 Mpts FFTs with power spectrum density, power averaging, real, imaginary, and real+imaginary settings)

Statistical and Graphical Analysis

- 1 Mpts Trends and Histograms 19 histogram parameters
- Track graphs of any measurement parameter

Intermediate Math Software Package (WRXi-XWAV)

Math:

 1 Mpts FFTs with power spectrum density, power averaging, real, and imaginary components

Statistical and Graphical Analysis

- 1 Mpts Trends and Histograms
- 19 histogram parameters
- Track graphs of any measurement parameter

Vertical System	WaveRunner 44Xi-A 44MXi-A	WaveRunner 64Xi-A 64MXi-A	WaveRunner 62Xi-A	WaveRunner 104Xi-A 104MXi-A	WaveRunner 204Xi-A 204MXi-A
Nominal Analog Bandwidth @ 50 Ω, 10 mV–1 V/div	400 MHz	600 MHz	600 MHz	1 GHz	2 GHz
Rise Time (Typical)	875 ps	500 ps	500 ps	300 ps	180 ps
Input Channels	4	4	2	4	4
Bandwidth Limiters	20 MHz; 200 MHz				
Input Impedance	1 MΩ 16 pF or 5			1 MΩ 20 pF or 50	Ω
Input Coupling	50 Ω: DC, 1 MΩ: A				
Maximum Input Voltage	50Ω : $5 V_{rms}$, $1 MΩ$ (DC + Peak AC ≤ 5	2: 400 V max.		50 Ω: 5 V _{rms} , 1 MΩ (DC + Peak AC ≤ 1	
Vertical Resolution		th enhanced resolution	on (ERES)		
Sensitivity			MΩ: 2 mV–10 V/div ful	ly variab l e	
DC Gain Accuracy			ull scale, ≥ 10 mV/div (
Offset Range		nV/div, ±10 V @ 100 mV 3 mV/div, ±10 V @ 100 ′–10 V/div		±10 V @ 100 mV-1 V	2–4.95 mV/div, ±1 V @ @ 100 mV–1 V/div,
Input Connector	ProBus/BNC				
Timebase System					
Timebases			channels; an external c		
Time/Division Range	Real time: 200 ps/	div–10 s/div, R I S mod	de: 200 ps/div to 10 ns,	div, Roll mode: up to	1,000 s/div
Clock Accuracy	≤ 5 ppm @ 25 °C (1	typical) (≤ 10 ppm @ !	5–40 °C)		
Sample Rate and Delay Time Accuracy	Equal to Clock Acc	curacy			
Channel to Channel Deskew Range	±9 x time/div setti	ng, 100 ms max., ead	ch channel		
External Sample Clock		to 2 Ch operation (1	i-A/104MXi-A and 2047 Ch in 62Xi-A), (minimu		(limited BW in 1 M Ω), itude requirements apply
Roll Mode	User selectable at	≥ 500 ms/div and ≤ 1		404V: A	004V: A
Acquisition System	44Xi-A 44MXi-A	64Xi-A 64MXi-A	62Xi-A	104Xi-A 104MXi-A	204Xi-A 204MXi-A
Single-Shot Sample Rate/Ch	5 GS/s				
Interleaved Sample Rate (2 Ch)	5 GS/s	10 GS/s	10 GS/s	10 GS/s	10 GS/s
Random Interleaved Sampling (RIS)	200 GS/s				
RIS Mode	User selectable fro	om 200 ps/div to 10 n	s/div	User selectable from	m 100 ps/div to 10 ns/div
Trigger Rate (Maximum)	1,250,000 wavefor	rms/second			
Sequence Time Stamp Resolution	1 ns				
Minimum Time Between Sequential Segments	800 ns				
Acquisition Memory Options Standard	Max. Acquisition P 12.5M/25M	oints (4 Ch/2 Ch, 2 C	h/1 Ch in 62Xi-A)	Segments (Sec 10,000	uence Mode)
Acquisition Processing	44Xi-A 44MXi-A	64Xi-A 64MXi-A	62Xi-A	104Xi-A 104MXi-A	204Xi-A 204MXi-A
Time Resolution (min, Single-shot)	200 ps (5 GS/s)	100 ps (10 GS/s)	100 ps (10 GS/s)	100 ps (10 GS/s)	100 ps (10 GS/s)
Averaging		inuous averaging to			
ERES	From 8.5 to 11 bits vertical resolution				
Envelope (Extrema)		roof for up to 1 millio	on sweeps		
Interpolation	Linear or (Sinx)/x				
Trigger System	N	1.0			
Trigger Modes	Normal, Auto, Sing				
Sources			Line; slope and level u	nique to each source,	except Line
Trigger Coupling		5 Hz), HF Reject, LF			
Pre-trigger Delay	0–100% of memory size (adjustable in 1% increments, or 100 ns)				
Post-trigger Delay			e, limited at slower tin	ne/div settings in roll r	mode
Hold-off	1 ns to 20 s or 1 to	1,000,000,000 even	ts		

	WaveRunne 44Xi-A	r WaveRunner 64Xi-A	WaveRunner 62Xi-A	WaveRunner 104Xi-A	WaveRunner 204Xi-A
Trigger System (cont'd)	44MXi-A	64MXi-A		104MXi-A	204MXi-A
Internal Trigger Level Range	±4.1 div from ce				
Trigger and Interpolator Jitter	≤ 3 ps rms (typic			0 " 0 4 0 !!	0 " 0 0011
Trigger Sensitivity with Edge Trigger (Ch 1–4 + external, DC, AC, and _Frej coupling)	2 div @ < 400 N 1 div @ < 200 N				2 div @ < 2 GHz 1 div @ < 200 MH
Max. Trigger Frequency with	400 MHz	600 MHz	600 MHz	1 GHz	2 GHz
SMART Trigger™ (Ch 1–4 + external)	@ ≥ 10 mV	@ ≥ 10 mV	@ ≥ 10 mV	@ ≥ 10 mV	@ ≥ 10 mV
External Trigger Range	EXT/10 ±4 V; EX	(T ±400 mV			
Basic Triggers					
Edge			<u>itive, negative, either, o</u>		
TV-Composite Video	(50 or 60 Hz) and	Line; or CUSTOM with	and field; HDTV (720p, 1 selectable Fields (1–8), L r Synch Pulse Slope (Pos	ines (up to 2000), Frame	
SMART Triggers					
State or Edge Qualified	Delay between	sources is selectable b		·	
Qualified First			repeatedly on event B e acquisition. Delay be		
Dropout			nan selected time betw		
Pattern	on WaveRunner	Logic combination (AND, NAND, OR, NOR) of 5 inputs (4 channels and external trigger input – 2 Ch+EXT on WaveRunner 62Xi-A). Each source can be high, low, or don't care. The High and Low level can be selected independently. Triggers at start or end of the pattern			
SMART Triggers with Exclusion	n Technology				
Glitch and Pulse Width		Triggers on positive or negative glitches with widths selectable from 500 ps to 20 s or on intermittent faul (subject to bandwidth limit of oscilloscope)			
Signal or Pattern Interval	Triggers on intervals selectable between 1 ns and 20 s				
Timeout (State/Edge Qualified)	Triggers on any source if a given state (or transition edge) has occurred on another source. Delay between sources is 1 ns to 20 s, or 1 to 99,999,999 events				
Runt	Trigger on positi 1 ns and 20 s	Trigger on positive or negative runts defined by two voltage limits and two time limits. Select between			
Slew Rate	Trigger on edge rates. Select limits for dV, dt, and slope. Select edge limits between 1 ns and 20 s				
Exclusion Triggering	Trigger on interr	mittent faults by specify	ring the normal width o	r period	
LeCroy WaveStream Fast View					
Intensity			le via front panel contro	ol	
Number of Channels	up to 4 simultan				
Max Sampling Rate			/64MXi-A,104Xi-A/104N	//Xi-A, 204Xi-A/204MXi	-A in interleaved mo
Waveforms/second (continuous) Operation		aveforms/second	II-time mode and LeCro	w WaveStream Fast Vi	ewing mode
Automatic Setup	Tront panel togg	gio bottwoon normal roc	ii tiirie mode dha Leore	y vavooroannast vi	evving mode
Auto Setup	Automatically se	ets timebase, trigger, a	nd sensitivity to display	a wide range of repeti	tive signa l s
Vertical Find Scale	Automatically se with maximum		ty and offset for the se	lected channels to disp	olay a waveform
Probes	44Xi-A 44MXi-A	64Xi-A 64MXi-A	62Xi-A	104Xi-A 104MXi-A	204Xi-A 204MXi-A
Probes			nal passive and active p		
Probes Probe System; ProBus			rariety of compatible pro		
Scale Factors			pending on probe used		
Color Waveform Display	,				
Гуре	Color 10.4" flat-p	panel TFT-LCD with hig	h resolution touch scre	en	
Resolution					6 pixels
Number of Traces	SVGA; 800 x 600 pixels; maximum external monitor output resolution of 2048 x 1536 pixels Display a maximum of 8 traces. Simultaneously display channel, zoom, memory, and math traces				
Grid Styles	Auto, Single, Du	ıal, Quad, Octal, XY, Sir	igle + XY, Dual + XY		

	Display up to 4 2	Zoom/Math traces wi	th 16 bits/data point		
	1 / 1				
Internal Waveform Memory					
				ngth waveform with 16	bits/data point) o
	Store to any nun	nber of files limited o	ily by data Storage III	eula	
Setup Storage					
Front Panel and Instrument Status	Store to the inte	rnal hard drive, over t	he network, or to a L	ISB-connected peripher	al device
Interface					
Remote Control	Via Windows Au	ıtomation, or via LeCr	oy Remote Comman	d Set	
Network Communication Standard	·	_XI Class C Complian	t		
GPIB Port (Accessory)	Supports IEEE –				
Ethernet Port		e-T Ethernet interface			
USB Ports				dows-compatible device	
External Monitor Port		D-Type SVGA-compa op display mode with		a second monitor to use	9
Serial Port		rt (not for remote osc			
	44Xi-A	64Xi-A	62Xi-A	104Xi-A	204Xi-A
Auxiliary Input	44MXi-A	64MXi-A	UZAI-A	104MXi-A	204MXi-A
Signal Types		xternal Trigger or Exte	ernal Clock input on f	ront panel	
Coupling	50 Ω: DC, 1 MΩ				
Maximum Input Voltage	50 Ω: 5 V _{rms} , 1 N (DC + Peak AC :			50 Ω: 5 V _{rms} , 1 N (DC + Peak AC :	
Auxiliary Output					
Signal Type	Trigger Enabled,	Trigger Output. Pass	/Fail, or Off		
Output Level	TTL, ≈3.3 V		•		
Connector Type	BNC, located on	rear panel			
General					
Auto Calibration	Engures enecifie	ed DC and timing accu	racy is maintained fo	or 1 year minimum	
Calibrator				y of signals for probe ca	alibration
Calibrator	and compensati		ctor provides a variet	y or signals for probe of	Indiation
Power Requirements			10%) at 400 Hz, Auto	matic AC Voltage Selec	tion
	Installation Cate	gory: 300 V CAT II; M		ion: 340 VA/340 W; 290	
	for WaveRunner	- 62Xi-A			
Environmental					
Temperature: Operating	+5 °C to +40 °C				
Temperature: Non-Operating	-20 °C to +60 °C	,			
Humidity: Operating		ve humidity 80% for t humidity at 40 °C	emperatures up to 3°	1 °C decreasing linearly	
Humidity: Non-Operating		(non-condensing) as t	ested ner MII -PRF-2	8800E	
Altitude: Operating		10,000 ft.) @ ≤ 25 °C	ootou por mil-i mi-2	00001	
Altitude: Operating Altitude: Non-Operating	Up to 12,190 m				
Physical					
Dimensions (HWD)	260 mm v 340 r	nm x 152 mm. Evolus	ling accessories and	projections (10.25" x 13	4" × 6")
Net Weight	7.26 kg. (16.0 lb		arry accessories allu	projections (10.20 X 13	. + ^ 0 /
-	7.20 kg. (10.0 lb	3.]			
Certifications	05.0			-N. 0.10.10.10.10.10.10.10.10.10.10.10.10.10	
	CE Compliant, U and CSA C22.2		ntorms to EN 61326,	EN 61010-1, UL 61010-	1 2nd Edition,
Warranty and Service					
	3-year warranty;	calibration recomme	nded annually. Optior	nal service programs inc	lude extended

ORDERING INFORMATION

Product Description Product Code WaveRunner Xi-A Series Oscilloscopes

WaveRunner 204Xi-A
WaveRunner 104Xi-A
WaveRunner 64Xi-A
WaveRunner 62Xi-A
WaveRunner 44Xi-A

WaveRunner MXi-A Series Oscilloscopes

	opoo
2 GHz, 4 Ch, 5 GS/s, 12.5 Mpts/Ch (10 GS/s, 25 Mpts/Ch in Interleaved Mode) with 10.4" Color Touch Screen Display	WaveRunner 204MXi-A
1 GHz, 4 Ch, 5 GS/s, 12.5 Mpts/Ch (10 GS/s, 25 Mpts/Ch in Interleaved Mode) with 10.4" Color Touch Screen Display	WaveRunner 104MXi-A
600 MHz, 4 Ch, 5 GS/s, 12.5 Mpts/Ch (10 GS/s, 25 Mpts/Ch in Interleaved Mode) with 10.4" Color Touch Screen Display	WaveRunner 64MXi-A
400 MHz, 4 Ch, 5 GS/s, 12.5 Mpts/Ch (25 Mpts/Ch in Interleaved Mode) with 10.4" Color Touch Screen Display	WaveRunner 44MXi-A

Included with Standard Configuration

÷10, 500 MHz, 10 MΩ Passive Probe (Total of 1 Per Channel)
Standard Ports; 10/100/1000Base-T Ethernet, USB 2.0 (5),
SVGA Video out, Audio in/out, RS-232
Optical 3-button Wheel Mouse – USB 2.0
Protective Front Cover
Accessory Pouch
Getting Started Manual
Quick Reference Guide
Anti-virus Software (Trial Version)
Commercial NIST Traceable Calibration with Certificate
3-year Warranty

General Purpose Software Options

Statistics Software Package	WRXi-STAT
Master Analysis Software Package	WRXi-XMAP
(Standard with MXi-A model oscilloscopes)	
Advanced Math Software Package	WRXi-XMATH
(Standard with MXi-A model oscilloscopes)	
Intermediate Math Software Package	WRXi-XWAV
(Standard with MXi-A model oscilloscopes)	
Value Analysis Software Package (Includes XWAV and JTA	2) WRXi-XVAP
(Standard with MXi-A model oscilloscopes)	
Advanced Customization Software Package	WRXi-XDEV
(Standard with MXi-A model oscilloscopes)	
Spectrum Analyzer and Advanced FFT Option	WRXi-SPECTRUM
Processing Web Editor Software Package	WRXi-XWEB

Product Description Product Code

Application Specific Software Options

Jitter and Timing Analysis Software Package	WRXi-JTA2
(Standard with MXi-A model oscilloscopes)	
Digital Filter Software Package	WRXi-DFP2
Disk Drive Measurement Software Package	WRXi-DDM2
PowerMeasure Analysis Software Package	WRXi-PMA2
Serial Data Mask Software Package	WRXi-SDM
QualiPHY Enabled Ethernet Software Option	QPHY-ENET*
QualiPHY Enabled USB 2.0 Software Option	QPHY-USB [†]
EMC Pulse Parameter Software Package	WRXi-EMC
Electrical Telecom Mask Test Package	ET-PMT

^{*} TF-ENET-B required. [†] TF-USB-B required.

Serial Data Options

WRXi-I2Cbus TD
WRXi-SPIbus TD
WRXi-UART-RS232bus TD
WRXi-LINbus TD
CANbus TD
h Option CANbus TDM
WRXi-FlexRaybus TD
WRXi-FlexRaybus TDP
WRXi-Audiobus TD
WRXi-Audiobus TDG
WRXi-1553 TD

A variety of Vehicle Bus Analyzers based on the WaveRunner Xi-A platform are available. These units are equipped with a Symbolic CAN trigger and decode.

Mixed Signal Oscilloscope Options

500 MHz, 18 Ch, 2 GS/s, 50 Mpts/Ch	MS-500
Mixed Signal Oscilloscope Option	
250 MHz, 36 Ch, 1 GS/s, 25 Mpts/Ch	MS-500-36
(500 MHz, 18 Ch, 2 GS/s, 50 Mpts/Ch Interleaved)	
Mixed Signal Oscilloscope Option	
250 MHz, 18 Ch, 1 GS/s, 10 Mpts/Ch	MS-250
Mixed Signal Oscilloscope Option	

Probes and Amplifiers*

Set of 4 ZS1500, 1.5 GHz, 0.9 pF, 1 MΩ High Impedance Active Probe	ZS1500-QUADPAK
Set of 4 ZS1000, 1 GHz, 0.9 pF, 1 MΩ	ZS1000-QUADPAK
High Impedance Active Probe	
2.5 GHz, 0.7 pF Active Probe	HFP2500
1 GHz Active Differential Probe (÷1, ÷10, ÷20)	AP034
500 MHz Active Differential Probe (x10, ÷1, ÷10, ÷100)	AP033
30 A; 100 MHz Current Probe – AC/DC; 30 A _{rms} ; 50 A _{rms} P	ulse CP031
30 A; 50 MHz Current Probe – AC/DC; 30 A _{rms} ; 50 A _{rms} Pul	lse CP030
30 A; 50 MHz Current Probe – AC/DC; 30 A _{rms} ; 50 A _{peak} Pu	lse AP015
150 A; 10 MHz Current Probe – AC/DC; 150 A _{rms} ; 500 A _{pea}	k Pulse CP150
500 A; 2 MHz Current Probe – AC/DC; 500 A _{rms} ; 700 A _{peak}	Pulse CP500
1,400 V, 100 MHz High-Voltage Differential Probe	ADP305
1,400 V, 20 MHz High-Voltage Differential Probe	ADP300
1 Ch, 100 MHz Differential Amplifier	DA1855A

^{*}A wide variety of other passive, active, and differential probes are also available. Consult LeCroy for more information.

ORDERING INFORMATION

Product Description

Product Code

Hardware Accessories*

10/100/1000Base-T Compliance Test Fixture	TF-ENET-B [†]
USB 2.0 Compliance Test Fixture	TF-USB-B
External GPIB Interface	WS-GPIB
Soft Carrying Case	WRXi-SOFTCASE
Hard Transit Case	WRXi-HARDCASE
Mounting Stand – Desktop Clamp Style	WRXi-MS-CLAMP
Rackmount Kit	WRXi-RACK
Mini Keyboard	WRXi-KYBD
Removable Hard Drive Package (Includes removeable	WRXi-A-RHD
hard drive kit and two hard drives)	
Additional Removable Hard Drive	WRXi-A-RHD-02

 $^{^{\}star}$ A variety of local language front panel overlays are also available.

Customer Service

LeCroy oscilloscopes and probes are designed, built, and tested to ensure high reliability. In the unlikely event you experience difficulties, our digital oscilloscopes are fully warranted for three years, and our probes are warranted for one year.

This warranty includes:

- No charge for return shipping
- Long-term 7-year support
- Upgrade to latest software at no charge



Local sales offices are located throughout the world. Visit our website to find the most convenient location.

[†] Includes ENET-2CAB-SMA018 and ENET-2ADA-BNCSMA.