

## FlukeView™ 2 ScopeMeter software for documenting, archiving and analysis

Get more out of your ScopeMeter Test Tool with FlukeView 2 ScopeMeter Software for Windows.

- Documentation—transfer waveforms, screens and data to your PC for printing or importing data into a report
- Add text to ScopeMeter Test Tool settings—give operators guidance when recalling settings
- Archive—create a library of waveforms for easy reference, or waveform comparison
- Analysis—use cursors or export data to another analysis program



FlukeView-2 ScopeMeter software

## Oscilloscope modes

	190-062	190-102	190-202	190-502	190-104	190-204	190-504
<b>Vertical deflection</b>							
Number of channels	2	2	2	2	4	4	4
Bandwidth	60 MHz	100 MHz	200 MHz	500 MHz	100 MHz	200 MHz	500 MHz
Rise time	5.8 ns	3.5 ns	1.7 ns	0.7 ns	3.5 ns	1.7 ns	0.7 ns
Number of scope inputs	2 input channels plus external trigger				4 input channels		
Channel architecture	All inputs fully insulated from each other and from ground. Inputs may be activated in any combination						
Input coupling	AC or DC, with ground level indicator						
Input sensitivity	With 10:1 probe, 20 mV to 1000 V/div With 100:1 probe, 200 mV to 10 kV/div Direct (1:1), 2 mV to 100 V/div						
Bandwidth limiter	20 MHz and 10 kHz						
Polarity	Normal, Inverted, Variable						
Input voltage	CAT III 1000 V/CAT IV 600 V rated, see General specifications for further details						
Vertical resolution	8 bit						
Accuracy at 4 s to 10 μs/div	5 mV/div to 100 V/div, ±(1.5 % + 6 counts) 2 mV/div, ±(1.5 % + 10 counts)						
Input impedance	1 MΩ (± 1 %) // 15 pF (± 2.25 pF)						

## Oscilloscope modes (continued)

	190-062	190-102	190-202	190-502	190-104	190-204	190-504
<b>Horizontal</b>							
Maximum real-time sample rate (sampled simultaneously)	625 MS/s (each channel)	1.25 GS/s (each channel)	2.5 GS/s (each channel)	5 GS/s (single channel) or 2.5 GS/s (dual channel)	1.25 GS/s (each channel)	2.5 GS/s (2ch) 1.25 GS/s (4ch)	5 GS/s (single ch) or 2.5 GS/s (2ch) or 1.25 GS/s (4ch)
Record length	Up to 10,000 samples per channel						
Time base range	10 ns/div to 4 s/div	5 ns/div to 4 s/div	2 ns/div to 4 s/div	1 ns/div to 4 s/div	5 ns/div to 4 s/div	2 ns/div to 4 s/div	1 ns/div to 4 s/div
	Time base in a 1-2-4-sequence Slower time/division settings using ScopeRecord™ Roll mode (see 'Recorder mode')						
Maximum record length	10,000 samples per channel in scope mode 30,000 points per channel in ScopeRecord™ Roll mode (see 'Recorder mode')						
Timing accuracy	± (0.01 % of reading + 1 pixel)						
Glitch capture	8 ns (10 µs/div to 2 min/div)						
<b>Display and acquisition</b>							
Display	133 mm x 90 mm (5.3 in x 3.5 in) full-color high brightness LCD						
Display modes	Any combination of channels; average on/off; replay.						
Visible screen width	12 divisions horizontally in scope mode						
Digital persistence modes	Off, short, medium, long, infinite and envelope mode						
Waveform mathematics	One (190-xx2) or two (190-x04) mathematical operations on 2 input channels (A and B, C and D): add, subtract, multiply; X-Y-mode; Frequency Spectrum using FFT						
Acquisition modes	Normal, Averaged, Auto, Single Shot, ScopeRecord™ roll, glitch capture, waveform compare with automatic "Pass/Fail testing"; Replay						
<b>Trigger and delay</b>							
Source	Input A, B or External (via meter input)				Input A, B, C or D		
Modes	Automatic, Edge, Pulse Width, N-Cycle, External (190-xx2)						
Connect-and-View™	Advanced automatic triggering that recognizes signal patterns, automatically sets up and continuously adjusts triggering, time base and amplitude. Automatically displays stable waveforms of complex and dynamic signals like motor drive and control signals. Can be switched off if preferred.						
Pulse width triggering (on channel A)	Pulse width qualified by time Allows for triggering <t, >t, =t, ≠ t, where t is selectable in minimum steps of 0.01 div or 50 ns						
Time delay	1 full screen of pre-trigger view or up to 100 screens (=1,200 divisions) of post-trigger delay						
Dual slope triggering	Triggers on both rising and falling edges alike						
N-cycle triggering	Triggers on N-th occurrence of a trigger event; N to be set in the range 2 to 99						

## Oscilloscope modes (continued)

<b>Automatic capture of 100 screens</b>	
When in oscilloscope mode, the instrument ALWAYS memorizes the last 100 screens—no specific user setup required. When an anomaly is seen, the REPLAY button can be pressed to review the full sequence of screen events over and over. Instrument can be set up for triggering on glitches or intermittent anomalies and will operate in “baby-sit” mode capturing 100 specified events.	
Replay	Manual or continuous replay. Displays the captured 100 screens as a “live” animation, or under manual control. Each screen has date and time-stamp.
Replay storage	Ten sets of 100 screens each can be saved internally for later recall and analysis. Direct storage of additional sets on external flash memory drive through USB host port.
<b>FFT—frequency spectrum analysis</b>	
Shows frequency content of oscilloscope waveform using Fast Fourier Transform	
Window	Automatic, Hamming, Hanning or None
Automatic window	Digitally re-samples acquired waveform to get optimum frequency resolution in FFT resultant.
Vertical scale	Linear/Logarithmic (in volts or amps)
Frequency axis	Frequency range automatically set as a function of timebase range of oscilloscope
<b>Waveform compare and pass/fail testing</b>	
Waveform compare	Provides storage and display of a reference waveform for visual comparison with newly acquired waveforms. Reference is derived from an acquired waveform and can be modified in the oscilloscope.
Pass/Fail testing	In waveform compare mode, the oscilloscope can be set up to store only matching (“Pass”) or only non-matching (“Fail”) acquired waveforms in the replay memory bank for further analysis.
<b>Automatic scope measurements</b>	
V dc, V ac rms, V ac+dc, Vpeak max, Vpeak min, Vpeak to peak, A ac, A dc, A ac+dc, frequency (in Hz), rise time (using cursors), fall time (using cursors), Power Factor (PF), Watts, VA, VA reactive, phase (between 2 inputs A&B or C&D), pulse width (pos./neg.), duty cycle (pos./neg.), temperature °C, temperature °F (not for Japan), dBV, dBm into 50 Ω and 600 Ω, VPWM ac and VPWM(ac+dc) for measurement on pulse width modulated motor drives and frequency inverters, V/Hz ratio;	
Advanced power and motor drive functions	V/Hz ratio, Power Factor (PF), Watts, VA, VA reactive, V-PWM (ac) and V-PWM (ac+dc) for measurement on pulsewidth modulated motordrives and frequency inverters
<b>Cursor measurements</b>	
Source	On any input waveform or on mathematical resultant waveform (excl. X-Y-mode)
Dual horizontal lines	Voltage at cursor 1 and at cursor 2, voltage between cursors
Dual vertical lines	Time between cursors, 1/T between cursors (in Hz), voltage between markers, risetime with markers, falltime with markers; Vrms between cursors, Watts between cursors.
Single vertical line	Min-Max and Average voltage at cursor position; frequency and rms-value of individual frequency component in the FFT Resultant
Advanced functions	mA*s (current-over-time, between cursors); V*s (voltage over time, between cursors); W*s (energy, between cursors)
ZOOM	Ranges from full record overview to zoom in up to sample level, at any record length.

## Meter modes

	190-062	190-102	190-202	190-502	190-104	190-204	190-504
Meter inputs	Via 4 mm banana inputs, fully isolated from scope inputs and scope ground				Via BNC scope inputs		
Number of readings	One at a time via DMM input				Up to 4 automatic scope measurements simultaneously		
Maximum resolution	5,000 counts				± 999 counts (frequency: 9999 counts)		
Input impedance	1 MΩ (± 1 %) // 14 pF (± 1.5 pF)				1 MΩ (± 1 %) // 15 pF (± 2.25 pF)		
Advanced meter functions	Auto/manual ranging, relative measurements (Zero reference), TrendPlot™ recording						
	The specified accuracy is valid over the temperature range 18 °C to 28 °C Add 10 % of specified accuracy for each degree C below 18 °C or above 28 °C						
<b>Voltage</b>							
V dc accuracy	± (0.5 % + 6 counts)				± (1.5 % + 6 counts)		
<b>V ac true rms accuracy</b>							
15 Hz to 60 Hz	± (1 % + 10 counts)				± (1.5 % + 10 counts)		
60 Hz to 1 kHz	± (2.5 % + 15 counts)				—		
60 Hz to 20 kHz	—				± (2.5 % + 15 counts)		
<b>V ac+dc true rms accuracy</b>							
15 Hz to 60 Hz	± (1 % + 10 counts)				± (1.5 % + 10 counts)		
60 Hz to 1 kHz	± (2.5% + 15 counts)				—		
60 Hz to 20 kHz	—				± (2.5 % + 15 counts)		
Voltmeter ranges	500 mV, 5 V, 50 V, 500 V, 1,100 V						
<b>Resistance</b>							
Ranges	500 Ω, 5 kΩ, 50 kΩ, 500 kΩ, 5 MΩ, 30 MΩ				—		
Accuracy	± (0.6 % + 6 counts)				—		
<b>Other meter functions</b>							
Continuity	Beeper on < 50 Ω (± 30 Ω)				—		
Diode test	Up to 2.8 V				—		
Current (A)	A dc, A ac, A ac+dc using an optional current clamp or shunt Scaling factors: 0.1 mV/A, 1 mV/A to 100 V/A and 400 mV/A						
Temperature	With optional accessories. Scale factors 1mV/°C or 1mV/°F						

## Recorder mode

	190-062	190-102	190-202	190-502	190-104	190-204	190-504
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### ScopeRecord™ Roll Mode

Dual or multiple input waveform storage mode, using deep memory

Source and display	Input A, Input B, Dual All channels sampled simultaneously	Any combination of inputs, up to 4 channels. All channels sampled simultaneously
Memory depth	30,000 data points per channel, each holding min/max pair of information	
Min/max values	Min/max values are created at samples that are measured at high sample rate ensuring capture and display of glitches.	
Recording modes	Single sweep, continuous roll; Start-on-Trigger (through external); Stop-on-Trigger (through external)	Single sweep, continuous roll; Start-on-Trigger (through any channel); Stop-on-Trigger (through any channel)
Stop-on-trigger	ScopeRecord mode can be stopped by an individual trigger event, or by an interruption of a repetitive trigger signal, through any input channel (through External on 190-XX2 Series)	
Horizontal scale	Time from start, time of day	
Zoom	Ranges from full record overview to zoom in up to sample level	
Memory	Two multiple input ScopeRecord waveforms can be saved internally for later recall and analysis.	

### ScopeRecord™ Roll mode sample rate and recording timespan

Time base range	4 ms/div to 2 min/div
Recorded timespan	4.8 sec to 40 hr
Time/division in 'view all' mode	0.4 s/div to 4 h/div
Glitch capture	8 ns
Sample rate	125 MS/s
Resolution	160 µsec ~ 4.8 sec

### Trendplot™ Recording

Multiple channel electronic paperless recorder. Graphically plots, displays and stores results of up to four automatic scope measurements or a DMM-reading over time.

Source and display	Any combination of scope measurements, made on any of the input channels, or DMM reading (2-channel instruments)
Memory depth	19,200 points (sets) per recording. Each recorded sample point contains a minimum, a maximum and an average value, plus a date- and time-stamp.
Ranges	Normal view: 5 s/div to 30 min/div; In view-all mode: 5 min/div to 48 hr/div (overview of total record)
Recorded time span	Up to 22 days, with a resolution of 102 seconds; up to 5.5 days for 4 readings.
Recording mode	Continuous recording, starting at 5 s/div with automatic time-scale compression
Measurement speed	Three automatic measurements per second or more
Horizontal scale	Time from start, time of day
Zoom	Up to 64x zoom-out for full record overview, up to 10x zoom-in for maximum detail
Memory	Two multiple input TrendPlot records can be saved internally for later recall and analysis.

### Cursor measurements—all recorder modes

Source	Any waveform trace in any waveform display mode (Scope, ScopeRecord or TrendPlot)
Dual vertical lines	Cursors may be used to identify Min, Max or Average value of any datapoint in a record, with time between cursors, time from start or absolute time.

## General specifications

	190-062	190-102	190-202	190-502	190-104	190-204	190-504
<b>Input voltage range</b>							
Rated maximum floating voltage	CAT III 1000 V / CAT IV 600 V (maximum voltage between any contact and earth-ground voltage level)						
Probe input voltage VPS410-II	CAT III 1000 V / CAT IV 600 V (Maximum voltage between standard 10:1 probe tip and reference lead)						
Probe input voltage VPS421	CAT III 1000V / CAT IV 600V (Maximum voltage between probe tip or reference lead to GND, 2000V max between probe tip and reference lead)						
Maximum BNC input voltage	CAT IV 300 V (maximum voltage on BNC input directly)						
Maximum voltage on meter input	CAT III 1000 V / CAT IV 600 V (safety designed banana input connectors)				—		
<b>Memory save and recall</b>							
Memory locations (internal)	30 waveform memories plus 10 recording memories plus 9 screen copy memories						
30 waveform memories	Each memory can contain up to 2 or 4 waveforms plus corresponding setups.						
10 recording memories	Each may contain: a 100 Screen Replay sequence, or a ScopeRecord Roll-mode recording (2 or 4 traces), or a TrendPlot recording of up to 4 measurements						
External data storage	On PC, using FlukeView™-2 Software, or direct storage on external flash memory drive (maximum 32 GB) through USB host port						
Screencopies	On PC, using FlukeView™-2 Software, or internally (in instrument) which can be copied on to external flash memory drive as .BMP-file, through USB host port						
Volatility	Saving is done in non-volatile Flash-ROM and all data is secured, independent of battery or power status.						
Real-time clock	Provides date and time stamp information for ScopeRecord, for 100 Screen Replay sequences and for TrendPlot recordings.						
<b>Case</b>							
Design	Rugged, shock-proof with integrated protective holster. Handstrap and hangstrap included as standard. Kensington lock supported to lock down instrument when left unattended.						
Drip and dust proof	IP 51 according to IEC60529						
Shock and vibration	Shock 30 g, vibration (sinusoidal) 3 g / 0.03 g <sup>2</sup> /Hz (Random), according to MIL-PRF-28800F Class 2						
Display size	133 mm x 90 mm (5.3 in x 3.5 in) LCD						
Resolution	1120 pixels x 765 pixels						
Brightness	User-adjustable, up to 300 cd/m <sup>2</sup>						
<b>Mechanical data</b>							
Size	265 mm x 192 mm x 70 mm (10.5 in x 7.6 in x 2.8 in)						
Weight (including battery)	2.1 kg (4.6 lb)				2.2 kg (4.8 lb)		

## General specifications (continued)

	190-062	190-102	190-202	190-502	190-104	190-204	190-504
<b>Power</b>							
Line power	Universal mains adapter/battery charger BC190/830 included, with detachable 2-wire power cords 100 Vac to 240 Vac, $\pm 10\%$ , 50-60 Hz						
Battery power	Re-chargeable Li-Ion battery (included). Battery swappable through easily accessible battery door at the rear of the instrument						
Battery type (incl.) and capacity [+opt. battery]	BP290: 10.8V, 2500 mAh [BP291 (5000 mAh) optional]			BP291: 10.8V, 5000 mAh			
Battery charge indicator	Battery has built-in status indicator for use with external charger, next to battery status indicator on instrument screen.						
Battery operating time (with backlight low)	Up to 3.5 using BP290 (included), up to 7 hours using BP291 (optional)			Up to 7 hours using BP291 (included)			
Battery charging time	2½ hours using BP290; 5 hours using BP291			Five hours for BP291			
Battery power saving functions	Auto 'power down' with adjustable power down time. Automatic 'display off' with adjustable power down time. On-screen battery power indicator						
<b>Safety</b>							
Compliance	EN61010-1-2001, Pollution Degree 2; IEC 61010-2-030: CAT IV 600 V / CAT III 1000 V						
<b>Environmental</b>							
Operating temperature	Battery discharging: 0 °C to 40 °C (32 °F to 104 °F) Battery charging: 0 °C to 40 °C (32 °F to 104 °F)						
Storage temperature	-20 °C to 60 °C (-4 °F to 140 °F)						
Humidity	0 °C to 10 °C (32 °F to 50 °F): noncondensing 10 °C to 30 °C (50 °F to 86 °F): 95 % ( $\pm 5\%$ ) 30 °C to 40 °C (86 °F to 104 °F): 75 % ( $\pm 5\%$ ) 40 °C to 50 °C (104 °F to 122 °F): 45 % ( $\pm 5\%$ )						
Maximum operating altitude	CAT IV 600 V, CAT III 1000 V: up to 2000 m (6 600 feet) CAT IV 300 V, CAT III 600 V, CAT II 1000 V: up to 4000 m (13 000 feet)						
Maximum storage altitude	12 km (40,000 ft)						
Electro-Magnetic Compatibility (EMC)	IEC 61326-1: Industrial; CISPR 11: Group 1, Class A; Korea (KCC): Class A Equipment (Industrial Broadcasting and Communication Equipment); USA (FCC): 47 CFR 15 subpart C.						
Interfaces	Two USB-ports provided. Ports are fully insulated from instrument's floating measurement circuitry. USB-host port directly connects to external flash memory drive (up to 32 GB) for storage of waveform data, measurement results, instrument settings and screen copies. Alternatively, this USB-A port may be used to connect a WiFi Adapter for wireless PC connectivity. A mini-USB-B is provided which allows for interconnection to PC for remote control and data transfer under PC-control using FlukeView-2.						
Probe calibration output	Dedicated probe-cal output with reference contact provided, fully insulated from any measurement input channel. Generator Output: 1.225 Vpp / 500 Hz square wave						
Warranty	3 years on main instrument, 1 year on battery and accessories						

## General specifications (continued)

	190-062	190-102	190-202	190-502	190-104	190-204	190-504
<b>Included accessories</b>							
Battery charger/ mains adapter	BC190/830						
Li-Ion battery pack	BP290 (10.8V, 2500 mAh)			BP291 (10.8V, 5000 mAh)			
Voltage probe sets Each set includes ground lead, hook clip; ground spring and probe tip insulation sleeve with VPS410-II-x.	2 pcs VPS421-x, ruggedized industrial-grade probes, 100:1, 150MHz with shrouded 4mm banana tip and large jaw alligator clips (one red, one blue)		2 pcs VPS410-II-x, 10:1 voltage probes, 500 MHz, (one red, one blue)		4 pcs VPS421- x, ruggedized probes, 100:1, 150 MHz, (red, blue, grey, green)	4 pcs VPS410-II-x, 10:1 voltage probes, 500 MHz, (one red, one grey, one blue, one green)	
Test leads	TL175 (one red, one black) with test pins				—		
Other	Li-Ion battery (BP290 or BP291, see above), Battery charger (BC190) with universal power cord set, Hangstrap, Handstrap (user selectable for left- or right hand use), download information for user manual and FlukeView®-2 demo package (with restricted functionality), and USB interface cable for PC connectivity. Feedthrough cable terminator, 50 Ω (one per channel, 190-50x only).						
Optional configuration	Each model is available as a 'boxed' version, described above, or with the optional SCC293 set included. SCC293 comprises: CXT293 rugged protective carrying case, full-version FlukeView PC software (activation code) and a WiFi dongle for wireless PC-connectivity using FlukeView-2 software.						
Optional accessories	SCC293, VPS101 - 1:1 voltage probe; VPS510-x - wide bandwidth compact probes; i400s-current clamp; HH290-hanging hook; CXT293-protective carrying case; TRM50-BNC Feedthrough cable terminator, 50 Ω, safety designed; EBC290-battery charging bay						

