# ScopeMeter® Test Tools

## Oscilloscopes for field applications

The ScopeMeter 190 Series of high-end performance oscilloscopes have bandwidth of 60, 100 and 200 MHz and sample rates up to 2.5 GS/s. The 190C Series adds a high-resolution color display that has a fast update rate, waveform pass/fail testing and a digital persistence mode – making the analysis of complex and dynamic signals much easier.

For industrial electronic or electro mechanical applications, the 120 Series Industrial ScopeMeter, with a 20 or 40 MHz bandwidth and Connect–and–View™ triggering for an instant, stable display will get the job done.

### Features

|  | 199C | 196C | 199B | 196B | 192B | 125 | 124 | 123 |
|---|---|---|---|---|---|---|---|---|
| **Oscilloscope Features** | | | | | | | | |
| LCD Display | Color | | B/W | | | B/W | | |
| Persistence | Digital | | ● | ● | ● | | | |
| Waveform reference | ● | ● | ● | ● | ● | | | |
| Automatic pass fail testing | ● | ● | | | | | | |
| Cursors and zoom | ● | ● | ● | ● | ● | Cursors | Cursors | |
| Connect–and–View Triggering | ● | ● | ● | ● | ● | ● | ● | ● |
| Video triggering with line count | ● | ● | ● | ● | ● | ● | ● | ● |
| Selectable pulse width triggering | ● | ● | ● | ● | ● | | | |
| Capture and replay of last 100 screens | ● | ● | ● | ● | ● | | | |
| Dual Input TrendPlot | With cursors and zoom | | | | | ● | ● | ● |
| Memory for screens and setups | 10 screens and setups | | | | | 20 | 20 | 10 |
| Recorder memories, each can store 100 scope screens, a ScopeRecord or a TrendPlot | 2 recorder memories | | | | | | | |
| 1000V Independently floating isolated inputs | ● | ● | ● | ● | ● | | | |
| Meter measurements: VAC RMS, VAC+DC, VDC, Ohms, Continuity, Diode, Amps, Temp. (°C, °F) | ● | ● | ● | ● | ● | ● | ● | ● |
| Waveform mathematics: A + B, A – B, A x B, A versus B (X–Y–mode) | ● | ● | ● | ● | ● | | | |
| Frequency Spectrum Analysis using FFT | ● | ● | | | | | | |
| Power measurements and $V_{pwm}$ | ● | ● | ● | ● | ● | ● | | |
| Capacitance and frequency measurements | –/● | –/● | –/● | –/● | –/● | ●/● | ●/● | ●/● |
| Bus Health Test function | | | | | | ● | | |
| Rugged, Dust and drip proof case. | ● | ● | ● | ● | ● | ● | ● | ● |
| PC and Printer Interface via optically isolated RS-232/USB cable | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) |
| FlukeView® for Windows® Software (SW90W) | 1) | 1) | 1) | 1) | 1) | 1) | 1) | 1) |

● Standard equipped     1) Optional

### Specifications

(Check the Fluke web for detailed specifications)

|  | 199C | 196C | 199B | 196B | 192B | 125 | 124 | 123 |
|---|---|---|---|---|---|---|---|---|
| **Oscilloscope Specifications** | | | | | | | | |
| Bandwidth | 200 MHz | 100 MHz | 200 MHz | 100 MHz | 60 MHz | 40 MHz | | 20 MHz |
| Maximum real time sample rate | 2.5 GS/s | 1 GS/s | 2.5 GS/s | 1 GS/s | 500 MS/s | 25 MS/s | | |
| Input sensitivity | 2 mV to 100 V/div | | 5 mV to 100 V/div | | | 5 mV–500 V/div | | |
| Timebase range | 5 ns/div to 2 min/div | | | | 10 ns/div to 2 min/div | 10 ns/div to 1 min/div | | 20 ns/div to 1 min/div |
| Inputs and digitizers | 2 plus external trigger/DMM input | | | | | 2 | | |
| Independently floating isolated inputs | Up to 1000 V between inputs, references and ground | | | | | | | |
| Max. record length … in Scope mode: … in ScopeRecord mode: | 3.000 points per input 27.500 points per input or more (5 ms/div…2 min/div.) | | | | | 512 min/max points per input | | |
| Glitch capture | Up to 3 ns using Pulse Width triggering; 50 ns peak detect at 5 µs/div. to 1 min/div. | | | | | 40 nsec | | |
| Scope measurements | 7 cursor+30 automatic, incl. power and $V_{pwm}$ | | | | | cursors + 26 automatic plus power measure–ments and $V_{pwm}$ | | 26 automatic |
| True RMS multimeter | 5000 counts, single input | | | | | 5000 counts, dual input | | |
| **General Specifications** | | | | | | | | |
| Line Power | Adapter/Battery charger included | | | | | | | |
| Battery power | 4 hours NiMH | | | | | 7 hours NiMH | | |
| Size | 256 x 169 x 64 mm | | | | | 232 x 115 x 50 mm | | |
| Weight | 2 kg | | | | | 1.2 kg | | |
| Safety certified (EN61010-1) | 1000 V CAT II/600 V CAT III | | | | | 600 V CAT III | | |
| Warranty | 3 years | | | | | 3 years | | |

## Check the Fluke web site for Technical Specifications and Application Notes for the Fluke ScopeMeters

# ScopeMeter® 190 Series



**Fluke 199C**



**Fluke 196C**          **Fluke 199B**



**Fluke 196B**          **Fluke 192B**

## Speed, performance and analysis power

For more demanding applications, the ScopeMeter 190 Series high performance oscilloscopes offer specifications usually found on top–end bench instruments. With up to 200 MHz bandwidth, 2.5 GS/s real–time sampling and a deep memory of 27500 points per input they're ideal for engineers who need the full capabilities of a high performance oscilloscope in a handheld, battery powered instrument.

- Dual input – 60, 100 or 200 MHz models
- Up to 2.5 GS/s real time sampling per input
- Choice between a high resolution Color or Black and White display
- See even more detail than before. The Fluke ScopeMeter 190 family is now twice as fast with >100/second trace updates rates.
- High waveform resolution of max. 3000 datapoints per channel
- Digital Persistence for analyzing complex dynamic waveforms like on an analog scope (190C Series only)
- Fast display update rate for seeing dynamic behavior instantaneously
- Connect&View™ automatic triggering, a full range of manual triggering modes plus external triggering.
- Automatic capture and replay of 100 screens
- 27500 points per input record length using ScopeRecord mode
- Up to 1000 V independently floating isolated inputs
- Waveform reference for visual comparisons and automatic pass/fail testing of waveforms (190C Series only)
- $V_{pwm}$ function for motor drive and frequency inverter applications.
- Waveform mathematics: Add, Subtract and Multiply
- Frequency Spectrum Analysis using FFT (190C)
- Cursors, zoom and real–time clock
- 30 automatic waveform measurements
- Four hours rechargeable Ni–MH battery pack
- Includes a 5000 count true–RMS multimeter and a TrendPlot™ paperless recorder

### ScopeMeter for medical applications

The ScopeMeter 190 Series is also available optimized for measurements on medical imaging equipment and video display systems. For more information please visit the Fluke web site.

### Automatic capture and replay of 100 screens

Scope users know how frustrating it is to see a one time anomaly flash by never to be seen again. Not with the ScopeMeter 190 Series! Now you can look back in time with a touch of the replay button. In normal use, the instrument continuously memorizes the last 100 screens. Each time a new screen is acquired, the oldest is discarded. At any moment you can "freeze" the last 100 screens and scroll through picture–by–picture or replay as a 'live' animation. Cursors can be used for further analysis. You can even use the advanced trigger capabilities to capture up to 100 specific events. Two sets of 100 captured screens with individual time stamps can be stored for later recall or download to a PC.
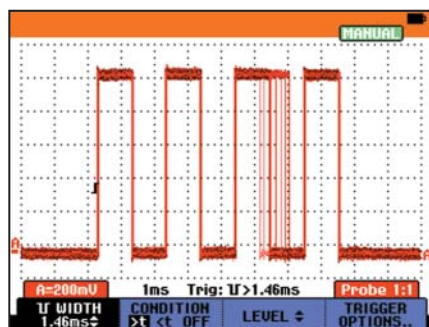




**True RMS**



**600V CAT III**
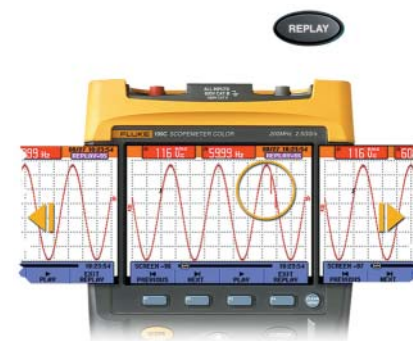
**On all inputs**

## See dynamic signal behavior instantaneously

The Digital Persistence mode helps to find anomalies and to analyze complex dynamic signals by showing the waveforms amplitude distribution over time using multiple intensity levels and user selectable decay time – it's as if you're looking at the display of an analog, real time oscilloscope! A fast display update rate reveals signal changes instantaneously, useful for instance when making adjustments to a system under test.
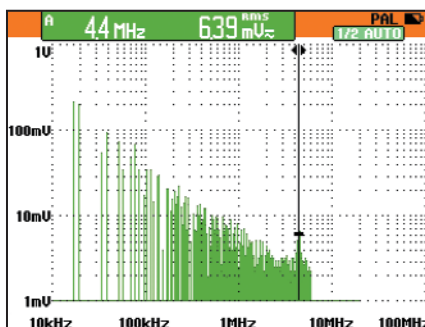
## Frequency Spectrum Analysis 190C

All 190C Color ScopeMeters include Frequency Spectrum Analysis on Fast Fourier Transformation (FFT) analysis as a standard feature.
This makes it possible to identify the individual frequency components contained in a signal. The spectrum analysis function is also handy to reveal the effects of vibration, signal interference or crosstalk. An automatic window function assures optimal windowing, although you may manually select your preferred time window.

## FlukeView® Software for documenting, archiving and analysis

FlukeView® for Windows® helps you get more out of your ScopeMeter by:
- Documenting – transfer waveforms, screens and measurement data from the ScopeMeter to a PC. Print or import the data into your report
- Archiving – create a library of waveforms with your comments for easy reference and comparison
- Analysis – use cursors, perform spectrum analysis or export data to other analysis programs



*Pulse width fluctuations are clearly visible using Digital Persistence*



*Frequency Spectrum shows an overview of frequencies contained in a signal.*
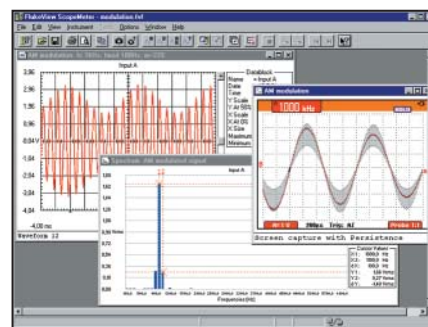


*FlukeView Screen*

## Included Accessories

BC190 Battery Charger
BP190 NiMH Battery Pack
VPS210-G + VPS210–R Voltage Probe
TL75 Hard Point Test Lead Set
user's manual (CD–Rom), Getting Started Booklet

## Ordering Information

| | |
|---|---|
| Fluke 192B | ScopeMeter (60MHz, 500 MS/s) |
| Fluke 196B | ScopeMeter (100 MHz, 1 GS/s)) |
| Fluke 199B | ScopeMeter (200 MHz, 2.5 Gs/s) |
| Fluke 196C | Color ScopeMeter (100 MHz, 1 GS/s) |
| Fluke 199C | Color ScopeMeter (200 MHz, 2.5 GS/s) |
| Fluke 192B/S | 192B + SCC 190 kit option |
| Fluke 196B/S | 196B + SCC 190 kit option |
| Fluke 199B/S | 199B + SCC 190 kit option |
| Fluke 196C/S | 196C + SCC 190 kit option |
| Fluke 199C/S | 199C + SCC 190 kit option |
| SCC190 | FlukeView Software, OC4USB cable, carrying case for Fluke 190B and 190C Series |
| SW90W | FlukeView Software |
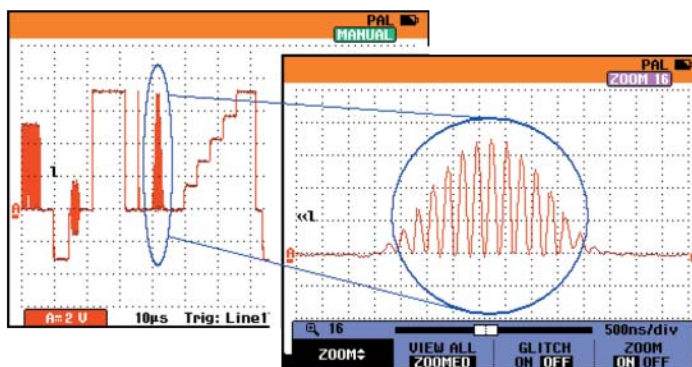


*Thanks to the deep memory, very small parts of the waveform can be studied in full detail using "zoom".*

## Recommended Accessories



| SCC190 | C195 | OC4USB | i400s | SCC198 |
|---|---|---|---|---|

# ScopeMeter® Accessories

## ScopeMeter probes

| VPS40 | VPS100/200 series | VPS210-R series | VPS210-G series | DP120 |
|---|---|---|---|---|

|  | VPS40 | VPS200-R | VPS200-G | VPS201 | VPS100-R | VPS100 | VPS250 | VPS121 | DP120 | PM8918/301 |
|---|---|---|---|---|---|---|---|---|---|---|
| Description | Voltage Probe Set | Voltage Probe Set | Voltage Probe Set | Voltage Probe Set | Voltage Probe Set | Voltage Probe Set | Voltage Probe Set | Voltage Probe | Differential Probe Set | Low Pass Filter Probe |
| Number and Color | One Black | One Red | One Grey | Red & Grey | One Red | Red & Grey | Red & Grey | One Black | Red & Grey | One Blue |
| Attenuation | 10:1 | 10:1 | 10:1 | 100:1 | 10:1 | 10:1 | 10:1 | 1:1 | 200:1, 20:1 | 10:1 |
| Band Width DC–MHz | 40 | 200 | 200 | 200 | 100 | 100 | 75 | 12 | 20 | 4 kHz |
| Length [m] | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 2.5 | 1.2 | 1.5 | 2.5 |
| EN 61010-2 CAT II | 1000 V | 1000 V | 1000 V | 1000 V | 1000 V | 1000 V | 1000 V | – | 1000 V | – |
| EN 61010-2 CAT III | 600 V | 600 V | 600 V | 600 V | 600 V | 600 V | 600 V | 300 V | 600 V | 600 V |
| ScopeMeter 190 Series |  | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| ScopeMeter 120 Series | ● |  |  |  |  |  | ● | ●[1] | ●[1] | ●[1] |

[1] Using BB 120

|  | VPS210-R | VPS210-G | VPS212-R | VPS212-G | VPS220-R | VPS220-G | VPS201 |
|---|---|---|---|---|---|---|---|
| Description | Voltage Probe Set | | Voltage Probe Set | | Voltage Probe Set | | Voltage Probe Set |
| Number and color | 1 Red | 1 Grey | 1 Red | 1 Grey | 1 Red | 1 Grey | 1 Black |
| Attenuation | 10:1 | | 10:1 | | 100:1 | | 1:1 |
| Bandwidth DC…MHz | 200 MHz | | 200 MHz | | 200 MHz | | 30 MHz |
| Length (m) | 1.2 m | | 2.5 m | | 1.2 m | | 1.2 m |
| EN 61010-2 CAT II | 1000 V | | 1000 V | | 1000 V | | – |
| EN 61010-2 CAT III | 600 V | | 600 V | | 600 V | | 300 V |
| ScopeMeter 190 Series | ● | ● | ● | ● | ● | ● | ● |
| ScopeMeter 120 Series |  |  | ● | ● |  |  |  |

| PM9091/9092 | PM9081 | PM9082 | PM9093 |
|---|---|---|---|

|  | PM9091 | PM9092 | PM9081 | PM9082 | PM9093 |
|---|---|---|---|---|---|
| Description | 50 Ω BNC cable set (1Red, 1Grey, 1Black) | 50 Ω BNC cable set (1Red, 1Grey, 1Black) | Dual Banana plug male to female BNC | Dual Banana jack male to female BNC | Male BNC to dual female BNC |
| Length | 1.5 m | 0.5 m |  |  |  |
| EN 61010-2 CAT III | 300 V | 300 V | 300 V | 300 V | 300 V |
| ScopeMeter 190 Series | ● | ● | ● | ● | ● |
| ScopeMeter 120 Series | ●[1] | ●[1] | ● | ●[1] | ●[1] |

[1] Using BB 120
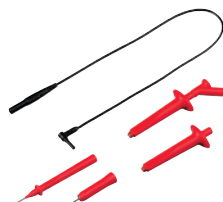
| RS200 | AS200-R | OC4USB | PM9080 | PM9090 |
|---|---|---|---|---|

| RS200 | Probe Replacement Set for VPS Series Probes |
|---|---|
| AS200-R | Probe Accessory Set, Red for VPS Series Probes |
| AS200-G | Probe Accessory Set, Grey for VPS Series Probes |
| PM9080 | Optical Interface Adapter Cable for serial port |
| OC4USB | Optical Interface Adapter Cable for USB Port |
| PM9090 | Probe Pin Grabber Flexible Clip for VPS Series Probes |
| PM9094 | Mini Testhook Set for PM8918 Probes |
| PAC91 | Printer Adapter Cable |

| Battery Packs | |
|---|---|
| PM9086 | NiCd Battery Pack for 90 Series |
| BP120MH | NiMH Battery Pack for 120 Series + 43B |
| BP190 | NiMH Battery Pack for 190 + 430 Series |

## All accessories have a one year warranty