Oscilloscopes for field applications

Powerful ScopeMeter® test capabilities:
- From 20 to 200 MHz bandwidth and up to 2.5 GS/s real-time sampling
- Up to seven hours operating time
- Now with FFT Analysis, advanced triggering and 3k memory length
**ScopeMeter® 190C and 190B Series: Speed, performance and analysis power**

For the 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 27,500 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 – 200, 100 or 60 MHz bandwidth**
- **Up to 2.5 GS/s real-time sampling per input**
- **Choice between a high-resolution color display (190C Series) or black-and-white display (190B Series)**
- **Connect-and-View® automatic triggering and a full range of manual trigger modes**
- **Digital Persistence mode for analyzing complex dynamic waveforms like on an analog scope**
- **Fast display update rate for seeing dynamic behavior instantaneously**
- **Automatic capture and replay of 100 screens**

- **27,500 points per input record length using ScopeRecord™ mode**
- **TrendPlot® paperless chart recorder for trend analysis up to 22 days**
- **Waveform reference for visual comparisons and automatic pass/fail testing of waveforms**
- **V_{TH} function for motor drive and frequency inverter applications**
- **Up to 1000 V independently floating isolated inputs for 1000 V CAT II and 600 V CAT III safety certification**
- **Four hours rechargeable NiMH battery pack**

See an on-line demonstration, go to [www.fluke.com scopemeter](http://www.fluke.com/scopemeter)

**See what’s really happening**

With a maximum real-time sampling rate of 2.5 GS/s per input, you can see what really happens, with 400 ps resolution. Both inputs have their own digitizer, so you can simultaneously acquire two waveforms and analyze them with the highest resolution and detail. If an anomaly flashes by on the screen, just press the Replay button to see it again. And thanks to the wider screen, you will always see a 12 divisions time window giving a far better overview of what’s happening both before and after the trigger event!

**Deeper waveform acquisition memory**

The waveform memory of all oscilloscopes in both the 190B and 190C Series has been enlarged to allow as many as 3000 samples per channel to be acquired. You can use the ZOOM function to find tiny details in a long waveform, for example, the color burst in a video signal or a single impulse in a complex data-stream. All models also allow the high-resolution waveforms to be transferred to a PC for later detailed analysis using FlukeView® ScopeMeter software.

**Easier identification of traces, everywhere**

The full-color display makes identification of individual waveforms easier, particularly when displaying large amplitude or multiple overlapping waveforms on screen. On-screen color labels, measurements and warnings are clearly linked to specific waveforms.

**See dynamic signal behavior instantaneously**

The Digital Persistence mode (Fluke 190C) helps to find anomalies and to analyze complex dynamic signals by showing the waveforms amplitude distribution over time. Digital Persistence uses multiple intensity levels and user selectable decay time—it’s as if you’re looking at the display of an analog, real-time oscilloscope! The fast display update rate that’s standard on all models reveals signal changes instantaneously, useful for instance when making adjustments to a system under test.

Thanks to the deeper memory, very small parts of the waveform can be studied in full detail using “zoom”.

**Advanced trigger modes**

The ScopeMeter 190 Series simplifies triggering with Connect-and-View® automatic triggering. Two new modes—“n-cycle triggering” and “dual-slope triggering”—have been added to the Fluke 190C Series to help you isolate the phenomena of interest. N-cycle triggering ensures you get a stable live image of a signal, for example, in-frequency dividers and clocked (synchronous) digital systems, or to synchronize on bursts of pulses.

Dual-slope triggering enables the oscilloscopes to trigger on both rising and falling edges alike. This means that any edge in the signal will act as a trigger event and initiate a new waveform acquisition, a most useful capability when making eye-patterns from digital data-streams, or in conjunction with single-shot phenomena. Manual modes include edge, delay, video and pulse width triggering. A fully isolated external trigger input is included for troubleshooting time relationships between two input signals synchronized to a third signal.

Digital Persistence mode gives analog scope-like display of complex and modulated signals.
ScopeMeter® 190 Series

The inrush current is measured on the part of the waveform excluded by the cursors.

Automatic capture and replay of 100 screens
ScopeMeter 190C and 190B Series features 30 automatic measurements, cursors, zoom and real-time clock. Now automatic power and Vrms-measurements can be performed on a specific user-defined period of time.

Pass/Fail testing of actual signal against a reference template
Waveform Pass/Fail testing is used to verify that waveforms meet specified test criteria. It is useful for testingcomplex systems, such as motor drive and control systems.

Deep memory for high-resolution ScopeRecord™
The ScopeRecord memory stores 27,500 points per input or more, for high-resolution recording of events up to 48 hours, and captures fast intermittents and glitches as short as 50 ns. This continuous roll mode stores events like motor start-ups. All models also have a “Stop-on-Trigger” in the ScopeRecord mode, allowing the ScopeMeter to store waveform data until the instrument is triggered or until a repetitive trigger is recognized. This way, the instrument will automatically recognize a power failure and store the waveform data preceding it. With 100 x zoom, you can look at the smallest details, like individual power cycles. Two of these 27,500 point recordings can be stored for later analysis.

ScopeMeter® 120 and 190 Series common functions Software and special value kits.

ScopeMeter® 120 Kit and 190 Series special value kit

FlukeView® Software for documenting, archiving and analysis
FlukeView for Windows helps you get more out of your ScopeMeter by:

• Documenting – transfer waveforms, screen and measurement data from the ScopeMeter to a PC. Print or import the data into your report.
• Adding user text to individual ScopeMeter settings – providing guidance to the operator when recalling a setup.
• Archiving – create a library of waveforms with your comments for easy reference and comparison. Store complete Replay cycles for analysis of waveform changes.
• Complete memory content of the ScopeMeter on your PC for back-up purposes.
• Waveform compare – store reference waveforms, add operator instructions, and send both to the ScopeMeter for waveform comparison and “Pass/Fail” testing.
• Analysis – use cursors, perform spectrum analysis or export data to other analysis programs.
• Connection to a PC via an optically isolated interface cable – Software and cable come as separate items or as part of a special value kit. This kit includes two protective hard shell carrying cases for safe and convenient transport of instrument and accessories.
Fluke 125 is the ScopeMeter of choice for the maintenance engineer who deals with industrial machinery and the industrial network connecting his plant processing equipment and machinery.

The Fluke 125 has all the functionality of the 124, plus it comes with the following extensions:

- **Bus Health mode** gives a clear “Good” / “Bad” indication for the electrical signals on industrial buses and networks, such as Foundation Fieldbus CAN-bus, Profinet, Ethernet, RS-232 and many more. The Fluke 125 validates the quality of the electrical signals on a network segment. It checks the signal levels and speed, transition times and distortion, and compares these to the appropriate standards to help you find errors like improper cable connections and terminators. It helps you find the source of error in case communication comes to a halt. All the commonly found industrial network types are supported! See the technical datasheet at http://us.fluke.com/usen/products/Fluke+120.htm for more details on the Fluke 125.

- **Harmonics mode** graphically displays harmonics up to the 33rd harmonic to assist in fault-finding, e.g. with large non-linear loads.

- **Power measurements** for single phase and balanced three-phase systems. The Fluke 125 can display the Total Power (Watt), Apparent Power (VA), Reactive Power (VAR) and the Power Factor (PF), over a wide range of applied frequencies, including those seen with motor drives and inverters. As a result, you are able to easily see the effects on the various power measurements during start-up or under changing operational conditions. A current clamp is included as a standard.

In today’s complex systems, a meter measurement just doesn’t give enough detail to determine the cause of a fault. Signal anomalies, dropouts and glitches that might cause a machine to go down are best captured with an oscilloscope. The ScopeMeter 120 Series meets today's need of simultaneously measuring and checking waveforms. The unique Connect-and-View® triggering automatically displays stable waveforms of virtually any signal. It really is as easy as one-two-three!

The Compact ScopeMeter 120 Series is the rugged solution for industrial troubleshooting and installation applications. It’s a truly integrated test tool, with oscilloscope, multimeter and “paperless” recorder in one affordable, easy-to-use instrument. Find answers fast to problems in machinery, instrumentation, control and power systems.

- Dual-input 40 MHz or 20 MHz digital oscilloscope
- Two 5,000-count true-rms digital multimeters
- Automatic measurements
- A dual-input TrendPlot® recorder
- Connect-and-View® trigger simplicity for hands-off operation
- Shielded test leads for oscilloscope, resistance and continuity measurements
- 10:1 Voltage Probe included with Fluke 124 and 125 for reduced circuit loading
- Up to seven hours battery operation
- 600 V CAT III safety certified
- Optically isolated interface
- Rugged compact case
- New Fluke 125 gives bus health and power measurements

Dual-input measurement shows both meter readings and waveform at the same time.

**Scope mode**

With bandwidth of 20 MHz (Fluke 123) or 40 MHz (Fluke 124, 125) the Fluke 120 Series will capture and display almost any waveform found in today’s state-of-the-art industrial electronic or electro-mechanical applications. Even complex signals like variable frequency motor drives. With Connect-and-View®, it is as simple as connecting to the test point and letting the scope do the rest.

**Meter mode**

You don’t need to reach for another test tool to make a simple resistance measurement. The ScopeMeter 120 Series includes a multimeter on each input. Measure volts (ac or dc), resistance, capacitance, current via external clamp or shunt, temperature using an adapter or common time related measurements like frequency, duty cycle and more.

In today’s complex systems, a meter measurement just doesn’t give enough detail to determine the cause of a fault. Signal anomalies, dropouts and glitches that might cause a machine to go down are best captured with an oscilloscope. The ScopeMeter 120 Series meets today’s need of simultaneously measuring and checking waveforms. The unique Connect-and-View® triggering automatically displays stable waveforms of virtually any signal. It really is as easy as one-two-three!
### Selection Table

#### 120 and 190 Series ScopeMeter® Test Tools

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- **Bandwidth**: 200 MHz, 100 MHz, 60 MHz, 40 MHz, 40 MHz, 20 MHz
- **Max. real time sample rate**: 2.5 GS/s, 2.5 GS/s, 2.5 GS/s, 2.5 GS/s, 2.5 GS/s, 2.5 GS/s
- **Max. record length**: 3000 points, 512 points (min/max pair)
- **Input sensitivity**: 2 mV/div to 100 V/div, 5 mV/div to 100 V/div, 5 mV/div to 50 V/div
- **Independently floating**: Yes, Yes, No, No, No, No
- **Display**: Color, Monochrome, Monochrome
- **Persistence**: Digital persistence with variable decay, On/Off, –
- **Envelope Mode**: –, –, –
- **Waveform compare**: Visual + automatic, Visual only, –
- **FFT**: –, –, –
- **Pass/Fail testing**: Yes, Yes, –
- **Triggering**: Connect-and-View™ Triggering, –, –
- **Input sensitivity**: 2 mV/div to 100 V/div, 5 mV/div to 100 V/div, 5 mV/div to 50 V/div
- **Independently floating**: Yes, Yes, No, No, No, No
- **Display**: Color, Monochrome, Monochrome
- **Persistence**: Digital persistence with variable decay, On/Off, –
- **Envelope Mode**: –, –, –
- **Waveform compare**: Visual + automatic, Visual only, –
- **FFT**: –, –, –
- **Pass/Fail testing**: Yes, Yes, –
- **Triggering**: Connect-and-View™ Triggering, –, –
- **Input sensitivity**: 2 mV/div to 100 V/div, 5 mV/div to 100 V/div, 5 mV/div to 50 V/div

#### Ordering Information

- **Fluke 199C**: Color ScopeMeter (200 MHz / 2.5 GS/s) + SCC190
- **Fluke 199C/S**: Color ScopeMeter (100 MHz / 2.5 GS/s) + SCC190
- **Fluke 199B**: ScopeMeter (200 MHz / 2.5 GS/s) + SCC190
- **Fluke 199B/S**: ScopeMeter (100 MHz / 1 GS/s) + SCC190
- **Fluke 196C**: Color ScopeMeter (60 MHz / 1 GS/s) + SCC190
- **Fluke 196C/S**: Color ScopeMeter (40 MHz, with Bus Health) + SCC190
- **Fluke 196B/S**: Industrial ScopeMeter (60 MHz / 500 MS/s) + SCC190
- **Fluke 192B**: Industrial ScopeMeter (20 MHz / 500 MS/s) + SCC120 kit
- **Fluke 125**: Industrial ScopeMeter (40 MHz, with Bus Health) + SCC120 kit
- **Fluke 125/S**: Industrial ScopeMeter (40 MHz, with Bus Health) + SCC120 kit
- **Fluke 124**: Industrial ScopeMeter (40 MHz, with Bus Health) + SCC120 kit
- **Fluke 123**: Industrial ScopeMeter (20 MHz, with Bus Health) + SCC120 kit
- **Fluke 123/S**: Industrial ScopeMeter (20 MHz, with Bus Health) + SCC120 kit

#### Specifications

- **Max. Input Voltage**: 1000 V CAT II with VPS40, 40 MHz, 10:1 Voltage Probe (standard included with Fluke 125 and Fluke 124)

#### Safety

- **Safety (IEC 1010-1)**: 1000 V CAT II / 600 V CAT III certified
- **Battery**: 4 hours, NiMH, 7 hours, NiMH
- **Line power**: Adapter/battery charger included

#### Warranty

- **Three years on instrument / One year on standard accessories**

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**10 and 190 Series ScopeMeter® Test Tools**

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