High performance handheld scopes

BUILT TOUGH to keep up with you.

Over 20 years of ScopeMeter®
Test Tool Innovation

190 Series II ScopeMeter®
Portable Oscilloscopes
The Fluke 190 Series II ScopeMeter® oscilloscopes, with electrically isolated channels, are safety rated for industrial applications. These scopes combine rugged portability with the high performance of bench oscilloscopes to take you from troubleshooting microelectronics all the way into power electronic applications—from dc to 500 MHz.

Choose from two or four channel models with a wide range of bandwidth options. Fast sampling rates up to 5.0 GS/s, 200 ps resolution and deep memory of 10,000 samples per channel allow high-accuracy capture and display of waveform details, noise, and other disturbances.

Perform timing or amplitude related measurements on three phases or three-axis control systems, or simply compare and contrast multiple test points in a circuit under test. Features like TrendPlot™, ScopeRecord™, and Connect-and-View™ help you quickly diagnose industrial machinery, automation and process controls, and power electronics to minimize repair costs and downtime. These features make the oscilloscopes easy to use especially when diagnosing the most difficult problems like complex waveforms, induced noise, intermittent events and signal fluctuations or drift.

New Li-Ion battery technology keeps your scope on the job, all day.

ScopeMeter® portable oscilloscopes take you into territories where standard bench scopes can’t go: where it’s harsh, hazardous and dirty—without sacrificing any capabilities.

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New Li-Ion battery technology keeps your scope on the job, all day.

Fluke 190 Series II ScopeMeter® test tools are available with two or four channels, 60 MHz to 500 MHz. Choose the model that’s right for your application and budget.
Overvoltage category | In brief | Examples
---|---|---
CAT IV | Three-phase at utility connection, any outdoor conductors | • Refers to the “origin of installation,” that is, where low-voltage connection is made to utility power
• Electricity meters, primary overcurrent protection equipment
• Outside and service entrance, service drop from pole to building, run between meter and panel
• Overhead line to detached building, underground line to well pump

CAT III | Three-phase distribution, including single-phase commercial lighting | • Equipment in fixed installations, such as switchgear and polyphase motors
• Bus and feeder in industrial plants
• Feeders and short branch motors, distribution panel devices
• Lighting systems in larger buildings
• Appliance outlets with short connections to service entrance

CAT II | Single-phase receptacle connected loads | • Appliance, portable tools, and other household and similar loads
• Outlet and long branch circuits
  — Outlets at more than 10 meters (30 feet) from CAT III source
  — Outlets at more than 20 meters (60 feet) from CAT IV source

CAT I | Electronic | • Protected electronic equipment
• Equipment connected to [source] circuits in which measures are taken to limit transient overvoltages to an appropriately low level
• Any high-voltage, low-energy source derived from a high-winding resistance transformer, such as the high-voltage section of a copier

Table 1. Overvoltage installation categories. IEC 61010 applies to low-voltage (< 1000 V) test equipment.

Built to withstand harsh environments with the highest safety ratings

Rated all the way to CAT IV
ScopeMeter™ test tools are rugged solutions built for industrial troubleshooting. The new Fluke 190 Series II are double-insulated floating oscilloscopes safety rated for measurements in CAT III 1000 V / CAT IV 600 V environments.

Measure from mV to kV safely
Independent isolated inputs allow you to make measurements in mixed circuits having different ground references reducing the risk of accidental short circuits.

Conventional bench oscilloscopes without special differential probes and isolation transformers can only reference measurements to line power earth ground.

With standard probes that cover a wide application range from mV to kV, you’re ready for anything from microelectronics to heavy-duty higher voltage electrical applications.

IP-51 rated for harsh environments
Rugged and shock-proof, ScopeMeter™ portable oscilloscopes are built for dirty, hazardous environments. With its sealed case, it can endure dust, drips, humidity and airborne pollutants. Every time you reach for ScopeMeter™ portable oscilloscope you can be confident it will work reliably wherever your work takes you.
Multiply your diagnostic powers

with the new Fluke 190 Series II Portable Oscilloscopes

Introducing the scopes with CAT IV rating
The first CAT III 1000 V / CAT IV 600 V rated, two- and four-channel portable scopes on the market, the new Fluke 190 Series II brings an unprecedented combination of performance and ruggedness into the field.

Take on new challenges in industrial machinery, automation and process controls, power conversion electronics
Analyze timing and amplitude relationships of multiple signals simultaneously, easily compare and contrast waveform traces spotting irregularities with ease.
- For three-phase power applications like industrial motors and drives, UPS and inverters for wind energy, solar and diesel locomotive controls for transportation
- For three-axis testing when you need to measure input, output and control signals simultaneously
- Power electronic devices with switching IGBT’s produce pulses with fast, high voltage edges (dv/dt), the scope sample resolution is critical to accurately detecting edge rise-time and amplitude and the peak of any reflection.

The ultimate in portability
New high-performance batteries take advantage of Li-Ion technology to keep you going strong for up to seven hours. With the easy-access battery door you can make battery swaps fast.

USB connectivity makes it easy to capture and share waveforms
The new Fluke 190 Series II offers two USB ports, electrically isolated from measurement input circuits. Easily transfer data to a PC. Archive and share waveforms with OEMs, colleagues and support staff. Store waveforms, screen captures and instrument setups onto USB memory devices. The ScopeMeter® test tool allows for storing files in a CSV format which can be transferred to a USB stick. This file format can be used in Excel® for further data handling or in FlukeView® to study waveforms in greater detail.

Learn more about ScopeMeter® test tool applications with the new Fluke 190 Series II.

Go to www.fluke.com/ScopeMeterSeriesII
What could you do with four channels?

Take multiple measurements simultaneously to track down the root cause of your most complex troubleshooting challenges.

Easily diagnose timing-related issues with multiple signals
- Real-time inspection of multiple related signals simultaneously
- Measure a combination of input and output signals, system safety interlocks and feedback loops

Find problems in industrial systems including:
- Circuit voltage/current overloading
- Attenuation/input impedance mismatch
- Signal fluctuation/drift
- Conditioning circuits signal integrity
- Test point verification for critical signals
- Input/output/feedback timing issues
- Induced noise and disturbances
- Random shutdowns/reset

Diagnose VSDs* or power inverters and converters
- Harmonics, transients and loads in three-phase power input
- Troubleshoot dc to ac converters for faulty control circuits or output IGBT gate stages
- Cable interface—test PWM output for reflections and transients
- Accurately measure IGBT pulse edge rise-time, amplitude and peak of reflections
- Vpwm measurement to measure the effective voltage on drive outputs

For industrial electronics, four channels allow you to perform three-dimensional testing, measuring input, output and feedback signals simultaneously.

In three-phase systems like variable speed drives, UPS or back-up generators, use four channels to diagnose power input, dc to ac converters, or cable interface problems.

*Variable Speed Drive
Fluke ScopeMeter® test tools work harder to make your job easier

See what’s happening with fast real-time high resolution sampling. ScopeMeter® portable oscilloscopes offer a sample rate of up to 5 GS/s with up to 200 ps resolution.

**Connect-and-View™ triggering for an instant, stable display**
If you’ve used other scopes, you know how tricky triggering can be. If settings are incorrect, results can be unstable or incorrect. Connect-and-View™ automatically sets up correct triggering by recognizing signal patterns. Without touching a button, you get a stable, reliable and repeatable display of virtually any signal including motor drive and control signals. It’s especially fast and convenient when you’re measuring a number of test points in rapid succession.

**Built-in digital multimeter**
Conveniently switch from waveform analysis to precise multimeter measurements using the built in 5000 count digital multimeter. Measurement functions include Vdc, Vac, Vac+dc, resistance, continuity and diode test. Measure current and temperature using suitable shunt, probe or adapter with wide range of scaling factors.

**ScopeRecord™ mode for high resolution waveform recording up to 48 hours**
ScopeRecord™ memory stores up to 30,000 or more data points per channel, capturing fast intermittent and glitches as short as 8 ns. (Two sets of multiple-channel recordings can be stored for later analysis.)
- Records events like motion profiles and UPS, power supply or motor start-up cycles
- With the Stop on Trigger mode, the ScopeMeter® test tool automatically recognizes a power failure and stores the waveform data preceding it

**TrendPlot™ paperless recorder—records up to 22 days to help you find intermittent faults**
The toughest faults to find are those that happen once in a while. These intermittents can be caused by bad connections, dust, dirt, corrosion, or simply broken wiring or connectors. Line outages, sags or starting and stopping of a motor can also cause a machine to stop. You may not be around when it happens, but the Fluke ScopeMeter® test tool will be.
- Plot minimum and maximum peak values and average over time up to 22 days
- Plot any combination of voltages, amps, temperature, frequency and phase for all inputs, all with time and date stamp to pinpoint faults

**Connect-and-View™ captures even the most complex motor drive signals.**

**The built in multimeter provides convenient precision measurements.**

**Trend multiple measurements capturing signal intermittent events, signal drift or fluctuations.**

Capture high-resolution waveform details over extended period using ScopeRecord™ mode.
Persistence, FFT, mathematics and pass/fail waveform envelope testing

Pass/Fail testing of actual signal against a reference template.

Digital Persistence mode gives analog scope-like display of complex and modulated signals.

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

Conveniently store and transfer critical waveform data using isolated USB ports.

Look back in time with automatic capture and display of last 100 screens

It’s frustrating to see a one-time anomaly flash and miss it. Fluke ScopeMeter® test tools solve the problem by letting you look back in time with a touch of the replay button.

- In normal use, the instrument continuously memorizes the last 100 screens. As each 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.
- Use cursors for further analysis.
- Advanced triggering lets you capture up to 100 specific events (Two sets of 100 captured screens with individual time stamps can be stored for later recall or downloaded to a PC or USB stick.)

Cursors and automatic waveform measurements

With 30 automatic measurements, cursors, and zoom, ScopeMeter® test tools will perform automatic power and Vrms measurements on specific portions of the waveform within a specified time span.

Time Stamp

Real-time clock allows you to find out when a specific event was recorded.

FlukeView® ScopeMeter® software for documenting, archiving and analysis

Get more out of your ScopeMeter test tool with FlukeView® ScopeMeter SW90W 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, waveform comparison, or pass/fail testing.
- Analysis—use cursors, perform spectrum analysis or export data to another analysis program.
- Connect to your PC with optically isolated USB port.
Choose the model that fits your applications and budget. Fluke offers the broadest range of bandwidths in portable oscilloscopes—from 20 MHz to 500 MHz.

**A broad family of ScopeMeter® Test Tools**

**ScopeMeter® 190 Series II: Be prepared for anything in a CAT IV world with three-axis and three-phase testing.**

- 190-XX4 model with four independent isolated inputs
- 190-XX2 models with two independent isolated scope inputs and DMM input
- Choose 60 MHz, 100 MHz, 200 MHz or 500 MHz bandwidth
- Fast sample rate: up to 5 GS/s with up to 200 ps resolution
- Single shot, pulse width and video triggering
- Deep memory: 10,000 point per trace waveform capture
- CAT III 1000 V / CAT IV 600 V, safety rated
- Up to seven hours of operation with high-performance Li-Ion batteries
- Battery door for conveniently swapping out batteries to extend usage time plus optional external charger
- Two isolated USB ports, for memory devices and PC connectivity
- Security slot to lock down instrument using standard Kensington® lock
- Plus all the standard features of ScopeMeter test tool including TrendPlot™, Connect-and-View™ triggering and ScopeRecord™

**ScopeMeter® 120 Series: Three-in one simplicity for electrical or electromechanical troubleshooting.**

- It’s an oscilloscope, a multimeter and a paperless recorder in one affordable, easy-to-use instrument
- Dual input
- Up to seven hours of battery operation
- CAT III 600 V safety rated
- Automatic measurements
- Choice of 40 MHz or 20 MHz bandwidth
- Two 5,000 count true-rms digital multimeters
- Includes standard ScopeMeter test tool features like Connect-and-View™ and TrendPlot™ recording
- Model 125 offers network bus health and power measurements for industrial systems testing
Comprehensive selection guides will be available on the web and in the datasheet.

### Industry applications

|--------------|------------|--------------------|------------------|------------|---------------------------|-----------------|----------|------------------------|

### 120 Series: Electrical and Electromechanical Troubleshooting

| 123 | • |
| 124 | • |

### Industrial Network Bus Health Troubleshooting

| 125 | • |

### 190 Series II: Industrial Electronics, Automation, Process Control Testing and Electronic Field Service

| 190-062 | • |
| 190-102 | • |
| 190-202 | • |
| 190-104 | • |
| 190-204 | • |
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### Selection guide

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ScopeMeter® Test Tool
ordering information

Models
Fluke 190-504  Color, 500 MHz, 4 channels
Fluke 190-504/S  Color, 500 MHz, 4 channels
Fluke 190-204  Color, 200 MHz, 4 channels
Fluke 190-204/S  Color, 200 MHz, 4 channels, with SCC-290 kit included
Fluke 190-104  Color, 100 MHz, 4 channels
Fluke 190-104/S  Color, 100 MHz, 4 channels, with SCC-290 kit included
Fluke 190-202  Color, 200 MHz, 2 channels plus DMM/Ext.input
Fluke 190-202/S  Color, 200 MHz, 2 channels plus DMM/Ext.input, with SCC-290 kit included
Fluke 190-102  Color, 100 MHz, 2 channels plus DMM/Ext.input
Fluke 190-102/S  Color, 100 MHz, 2 channels plus DMM/Ext.input, with SCC-290 kit included
Fluke 190-062  Color, 60 MHz, 2 channels plus DMM/Ext.input
Fluke 190-062/S  Color, 60 MHz, 2 channels plus DMM/Ext.input, with SCC-290 kit included
Fluke 125  Industrial (40 MHz)
Fluke 125/S  Industrial (40 MHz) + SCC120 kit
Fluke 124  Industrial (40 MHz)
Fluke 124/S  Industrial (40 MHz) + SCC120 kit
Fluke 123  Industrial (20 MHz)
Fluke 123/S  Industrial (20 MHz) + SCC120 kit
Fluke 122  Industrial (4 MHz)

Optional accessories
Accessories for ScopeMeter® 190 Series II
BC190  Mains/adapter/battery charger
BP290  Li-ion battery pack, 2400 mAh
BP291  Li-ion battery pack, 4800 mAh
EBC290  External battery charger for BP290 and BP291 [uses BC190 mains adapter]

HH290  Hanging Hook for 190 Series II instruments
VPS10-R  Electronic Voltage Probe set, 10:1, 500 MHz, one set red
VPS10-G  Electronic Voltage Probe set, 10:1, 500 MHz, one set grey
VPS10-B  Electronic Voltage Probe set, 10:1, 500 MHz, one set blue
VPS10-V  Electronic Voltage Probe set, 10:1, 500 MHz, one set green
VPS410-G  Industrial Voltage Probe set, 10:1, one set grey
VPS410-B  Industrial Voltage Probe set, 10:1, one set blue
VPS410-V  Industrial Voltage Probe set, 10:1, one set green
VPS410-R  Industrial Voltage Probe set, 10:1, one set red
VPS410-R  Industrial Voltage Probe set, 1:10, 150 MHz [bicolored, red/black]

VPS420-R  Industrial Voltage Probe set, 1:10, 150 MHz [bicolored blue/black]
VPS420-V  Industrial Voltage Probe set, 1:10, 150 MHz [bicolored green/black]

SW90W  FlukeView ScopeMeter® Software package (full version)
C290  Hard shell protective carrying case for 190 Series II

SCC290  FlukeView ScopeMeter® Software package (full version)
and C290 Carrying Case kit for 190 Series II

TL175  TwistGuard™ safety designed test leads set (1 red, 1 black)
TRM50  BNC Feedthrough 50 Ω terminator (set of 2 pieces, black)
AS400  Probe Accessory Extension Set for VPS400-series probes
RS400  Probe Accessory Replacement Set for VPS400-series probes
RS500  Probe Accessory Replacement Set for VPS500-series probes

Accessories for ScopeMeter 120 Series
SCC120  FlukeView® Software + Cable + Case
PM9080  Optically Isolated RS-232 adapter/cable
OC4USB  Optically Isolated USB interface cable

DF120  Differential Voltage Probe
BHT190  Bus Health Test break-out adapter for DB-9, RJ-4S and M12 connection systems
ITP120  Optically Isolated External Trigger Input

SW90W  FlukeView® ScopeMeter® Software for Windows®
C120  Hard Shell Carrying Case

Fluke 190 Series II instruments include a set of voltage probes (2 or 4 dependant on model), hanging strap, USB cable with mini-B connector, double capacity Li-Ion battery BP291, battery charger/power adapter BC190, a FlukeView demo package and user manuals on CD.

The 2-channel models come with two probes plus a set of TL175 test leads and a single capacity battery BP290.

SCC kit includes: Hard-shell carrying case, USB interface cable, and non demo version of FlukeView® for Windows® software.

Fluke Corporation
PO Box 9090, Everett, WA 98206 U.S.A.

Fluke Europe B.V.
PO Box 1186, 5602 BD Eindhoven, The Netherlands

For more information call:
In the U.S.A. (800) 443-5853 or Fax (425) 446-5116
In Europe/M-East/Africa +31 (0) 40 2675 200 or Fax +31 (0) 40 2675 222
In Canada (800)-36-FLUKE or Fax (905) 890-6866
From other countries +1 (425) 446-5500 or Fax +1 (425) 446-5116
Web access: http://www.fluke.com

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