FLUKE®

The toughest scopes ever built.

ScopeMeter® now takes you into CAT IV environments with four-channel testing.

FLUKE®

See more, fix more,

go where you've never gone with a scope before.

ScopeMeter® portable oscilloscopes take you into territory that standard bench scopes can't go: where it's harsh, hazardous and dirty.

The 190 Series ScopeMeter® oscilloscopes from Fluke, 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.

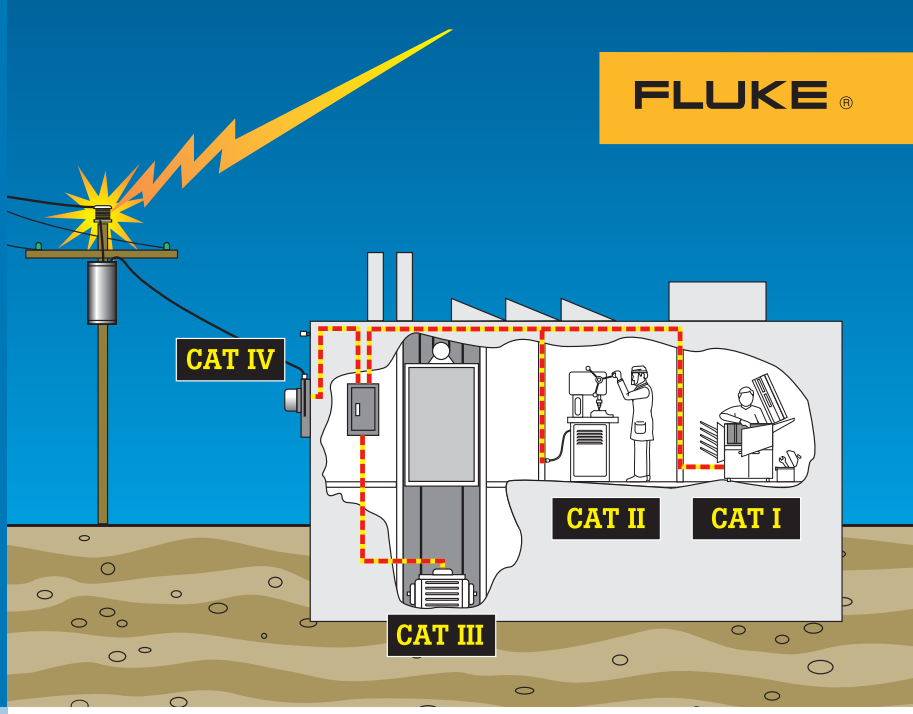
Choose from two or four channel models with a wide range of bandwidth options. Fast sampling rates up to 2.5 GS/s, 400 ps resolution and deep memory of 10,000 samples per channel allow high-accuracy capture and display of waveform details, noise, and other disturbances.

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, intermittent events and signal fluctuations or drift.

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

Fluke 190 Series ScopeMeter test tools are available with two or four channels, 60 MHz to 200 MHz. Choose the model that's right for your environment and budget.

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. The two-channel Fluke 190C Series is rated CAT II 1000 V/CAT III 600 V.

Measure from mV to kV safely
Independent isolated inputs allow you to make measurements in mixed circuits having different ground references and reduces 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 medium voltage electrical applications.

The only IP-51 rated scopes on the market
Rugged and shock-proof, ScopeMeter portable oscilloscopes are built for harsh environments. With its sealed case, it can endure dust, drips, humidity and airborne pollutants. Every time you reach for the scope you can be confident it will work reliably.

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 circuits, 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 that 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.

Multiply your diagnostic powers with the new four-channel Fluke 190 Series II

Introducing the first four-channel scope with CAT IV rating
The first CAT III 1000 V/CAT IV 600 V rated, four-channel portable scope 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, and diesel locomotive controls for transportation
- For three-axis testing when you need to measure input, output and control signals simultaneously

The ultimate in portability
New high-performance batteries take advantage of Li-ion technology to keep you going strong for a full shift. With the easy-access battery door you can make battery swaps fast.

New 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 unlimited waveforms, screen captures and instrument setups onto USB memory devices.

Request a copy of the new ATP book on motors and drives and learn more about four-channel applications with the new Fluke 190 Series II.

Go to **www.fluke.com/fourchannelscopemeter**

What could you do with four channels?

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

Easily diagnose timing-related issues with multiple signals

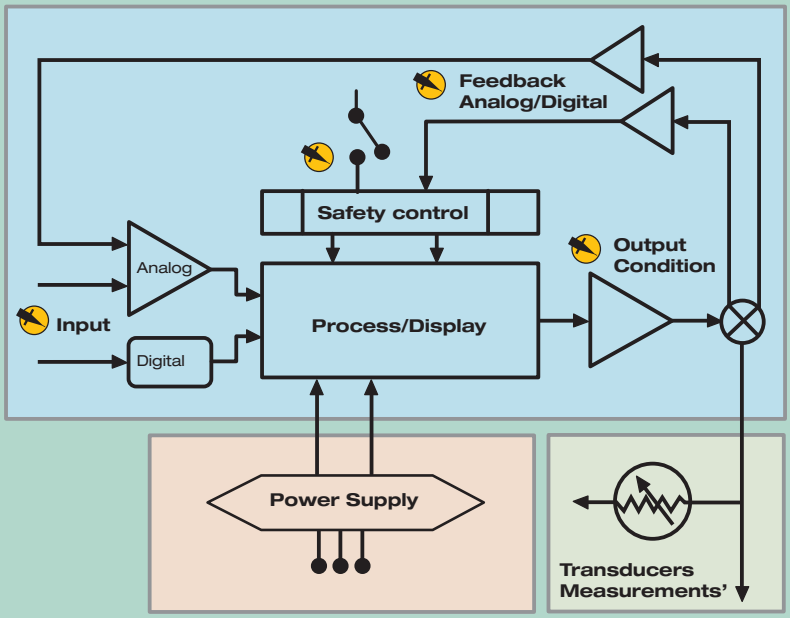
- Real-time inspection of multiple related signals simultaneously
- Measure a combination of input and output signals and system safety interlocks and feedback loops

Find problems in industrial systems including:

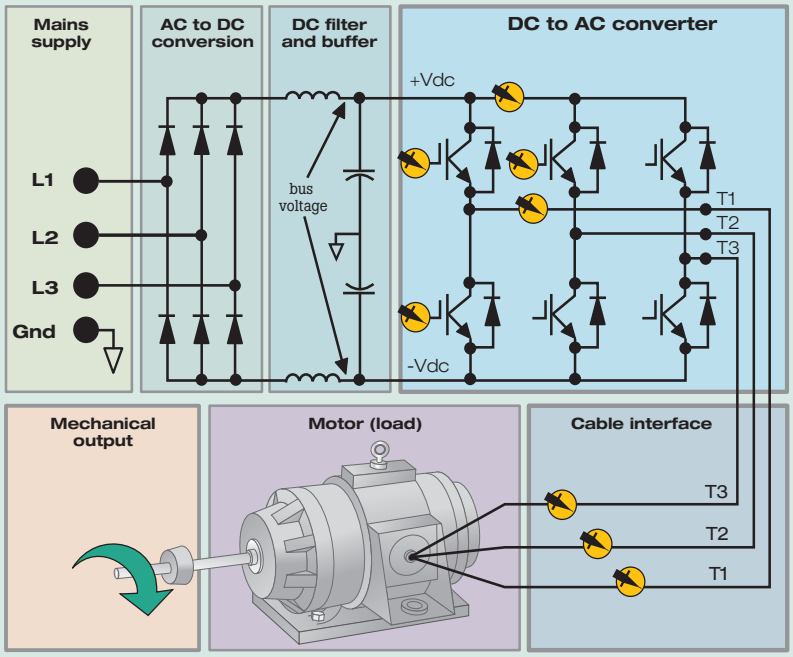
- Circuit voltage/current overloading
- Attenuation/input impedance mismatch
- Signal fluctuation/drift
- Conditioning circuits signal integrity
- Test point verification for critical signals
- Input/output/feedback timing issues
- Induced noise and disturbances
- Random shutdowns/reset

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



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



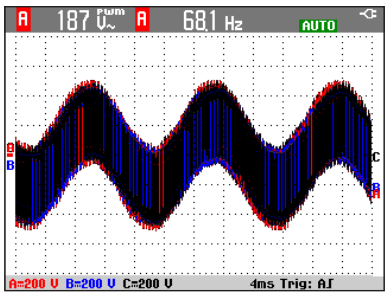
In three-phase systems like variable speed drives, UPS or back-up generators, use four channels to diagnose power input, dc to ac converters, or cable interface problems.

Fluke ScopeMeter test tools work harder to make your job easier

See what's happening with fast real-time high resolution sampling. ScopeMeter offers a sample rate of up to 2.5 GS/s with up to 400 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.

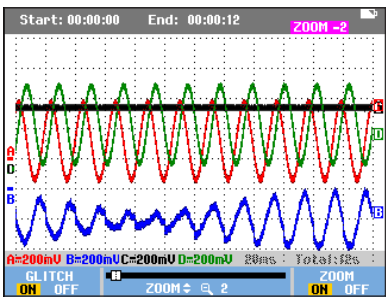


Connect-and-View™ captures even the most complex motor drive signals.

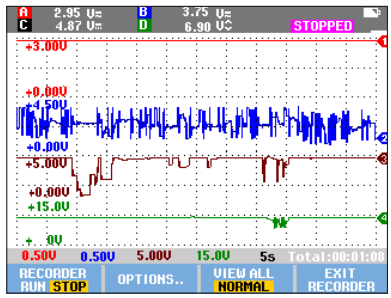
ScopeRecord™ mode for high resolution waveform recording up to 48 hours

ScopeRecord™ memory stores up to 27,000 data points per channel, capturing fast intermittents and glitches as short as 8 ns. (Two sets of multiple-channel recordings can be stored for later analysis.)

- Stores events like motion profiles, UPS, power supply and motor start-ups
- With the Stop on Trigger mode, the ScopeMeter automatically recognizes a power failure and stores the waveform data preceding it
- With the waveform zoom (up to 100x) you can look at the smallest details, like individual power cycles



Use the 27,000 points memory of ScopeRecord and zoom in for maximum detail.



Cursors and zoom features of the Fluke 190 Series help you to analyze the captured TrendPlot.

TrendPlot™ paperless recorder—records up to 16 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 will.

- Plot minimum and maximum peak values and average over time up to 16 days
- Plot any combination of voltages, amps, temperature, frequency and phase for all four inputs, all with time and date stamp to pinpoint faults

FlukeView® ScopeMeter software for documenting, archiving and analysis

Get more out of your ScopeMeter 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 settings—give operators guidance when recalling settings
- Archives—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

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

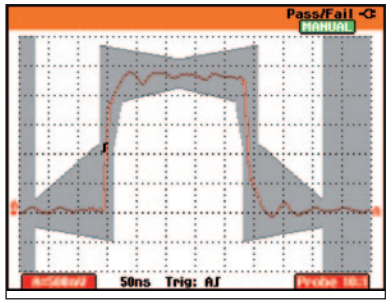
It's frustrating to see a one-time anomaly flash and miss it. Fluke ScopeMeter will solve the problem by letting you look back in time with a touch of the replay button.

- 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
- With advanced triggering you can 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.)

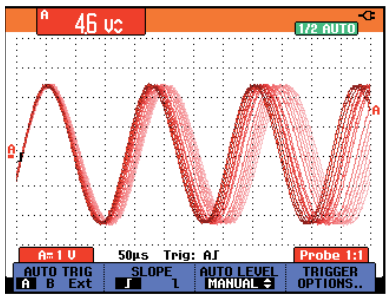
Cursors and automatic waveform measurements

With 30 automatic measurements, cursors, zoom and a real-time clock, the ScopeMeter will perform automatic power and Vrms measurements on the specific portion of the waveform you select within a specified time span.

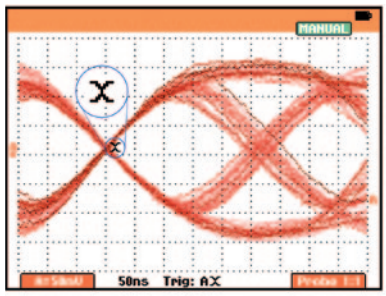
Persistence, FFT, mathematics and pass fail waveform envelope testing



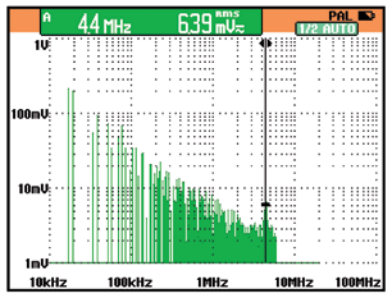
Pass/Fail testing of actual signal against a reference template.



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



Dual-slope triggering used to capture the eye-pattern on a digital datastream.



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

A broad family of ScopeMeter models

One, two or four input channels—choose the model that fits your applications and budget.

Fluke offers the broadest range of bandwidths in portable oscilloscopes—from 20 MHz to 200 MHz.

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

- Four independent isolated inputs
- Choose 100 MHz or 200 MHz bandwidth
- Fast sample rate: up to 2.5 GS/s with up to 400 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, standard
- Battery door for conveniently swapping out batteries to extend usage time
- 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 including TrendPlot™, Connect-and-View™ triggering and ScopeRecord™

ScopeMeter 190C Series: Bench performance in a rugged two-channel handheld for automation and process control applications.

- Dual input
- Choose your bandwidth: 60 MHz, 100 MHz, 200 MHz
- High-resolution color display
- Fast sample rate up to 2.5 GS/s with up to 400 ps resolution
- CAT II 1000 V/CAT III 600 V safety rated
- Plus all the standard features of ScopeMeter 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 features like Connect-and-View™ and TrendPlot™ recording
- Model 125 offers bus health and power measurements for industrial network testing

ScopeMeter 215C and 225C: ScopeMeter for Industrial Bus Health Testing leverages the full functionality of the 199C and 196C.

- Get the full functionality of a high-performance two-channel ScopeMeter plus powerful test capabilities to diagnose a wide variety of industrial bus systems
- In bus health test mode, it automatically analyzes the electrical signals passing through the bus, and compares the parameters to industry standard values for that bus type
- Or select an 'Eye pattern' display to visually check the overall signal quality
- Choose 200 MHz or 100 MHz bandwidth models

Which ScopeMeter fits you?

	Industrial		Industrial Electronics		Electronic Field Service		
Technologies	Electrical	Electro-mechanical	Process Controls	Automation	Medical Imaging	Avionics	A/V and Security Systems
Equipment	Switch gear, interlocks, VFD drives, pumps, fans, furnaces, presses, mixers, refrigeration	Actuators, linear motors, pressure, level, flow, positioning sensors, cutters, and packaging equipment	Transducers and sensors, loop controllers, calibrated gauges	PLC's, sensors, transducers, motion controllers, rotary encoders, scanners, readers, printers	XRay, MRI, ultrasound imaging equipment	Flight line navigation systems, communication systems, radars, on board aircraft control systems	Retail security devices, surveillance and monitoring equipment, RFID
120 Series: Electrical and Electromechanical Troubleshooting							
123	•						
124		•					
190C Series: Industrial Electronics, Automation and Process Control Testing							
192C			•				
196C	•			•			
199C				•	•	•	•
190 Series II: Four-Channel Industrial Electronics Applications							
190-104			•		•	•	•
190-204				•	•	•	•
Industrial Network Bus Health Troubleshooting							
125		•	•				
215C and 225C			•	•			

Comprehensive selection guides will be available on the web and in the datasheet

Fluke ScopeMeter Quick Selection Guide

	Fluke 190C Series			Fluke 190C Series with Bus Health		Fluke 190 Series II	
Features	**192C**	**196C**	**199C**	**215C**	**225C**	**190-104**	**190-204**
Bandwidth	60 MHz	100 MHz	200 MHz	100 MHz	200 MHz	100 MHz	200 MHz
Number of inputs	2 + 1	2 + 1	2 + 1	2 + 1	2 + 1	4	4
Dual Input TrendPlot™	•	•	•	•	•	•	•
Four Input TrendPlot™	–	–	–	–	–	•	•
ScopeRecord™ Mode	•	•	•	•	•	•	•
Automatic capture and replay last 100 screens	•	•	•	•	•	•	•
Bus Health test mode	–	–	–	•	•	–	–
Safety, power and warranty							
EN61010-1 CAT II	1000 V	1000 V	1000 V	1000 V	1000 V	–	–
EN61010-1 CAT III	600 V	600 V	600 V	600 V	600 V	1000 V	1000 V
EN61010-1 CAT IV	–	–	–	–	–	600 V	600 V
Battery	4 hrs, NiMH	4 hrs, NiMH	4 hrs, NiMH	4 hrs, NiMH	4 hrs, NiMH	7 hrs, Li-ion	7 hrs, Li-ion
Connectivity							
USB PC interface	optional	optional	optional	optional	optional	standard	standard
USB memory port	–	–	–	–	–	standard	standard
RS-232 interface to PC	optional	optional	optional	optional	optional	–	–

Ordering information

Fluke 190 Series II instruments include a set of four probes, hanging strap, USB cable with mini-B connector, double capacity Li-ion battery BP291, battery charger/power adapter BC190, a FlukeView demo package and users manuals on CD-ROM. The /S-versions also include the C290 hard-shell carrying case and the FlukeView software package.

Mainframes

ScopeMeter 190 Series II

Fluke 190-104, ScopeMeter Series II 100 MHz 4 Channel
Fluke 190-104/S, ScopeMeter Series II 100 MHz 4 Channel with SCC Kit
Fluke 190-204, ScopeMeter Series II 200 MHz 4 Channel
Fluke 190-204/S, ScopeMeter Series II 200 MHz 4 Channel with SCC Kit

ScopeMeter 190C Series

Fluke 192C, ScopeMeter 60 MHz
Fluke 192C/S, ScopeMeter 60 MHz with SCC Kit
Fluke 196C, ScopeMeter 100 MHz
Fluke 196C/S, ScopeMeter 100 MHz with SCC Kit
Fluke 199C, ScopeMeter 200 MHz
Fluke 199C/S, ScopeMeter 200 MHz with SCC Kit
Fluke 225C, ScopeMeter (200 MHz/2.5 GS/s) with Bus Health Test Functions
Fluke 225C/S, ScopeMeter (200 MHz/2.5 GS/s) with Bus Health Test + SCC190 kit
Fluke 215C, ScopeMeter (100 MHz/1 GS/s) with Bus Health Test Functions
Fluke 215C/S, ScopeMeter (100 MHz/1 GS/s) with Bus Health Test + SCC190 Kit

Optional accessories

Accessories for ScopeMeter 190 Series II

SW90W, FlukeView® ScopeMeter® Software for Windows
C290, Hard Shell Carrying Case
SCC290, FlukeView Software and Carrying Case kit
BC190, Battery Charger/Power Adapter for Fluke 190 Series ScopeMeter
BP291, Double Capacity Li-ion Battery Pack for Fluke 190 Series II
HH290, Hanging Hook
EBC290, External Battery Charger
VPS420-R High Working Voltage Probe, 100:1, Red and Black
AS400, Probe Accessory Extension Set

Accessories for ScopeMeter 190C Series

SW90W, FlukeView ScopeMeter Software for Windows
C190, Hard Shell Carrying Case
SCC190, FlukeView Software, cable and carry case kit
BC190, Battery Charger/Power Adapter for Fluke 190 Series ScopeMeter
BP190, Rechargeable NiMH Battery Pack for Fluke 190C Series
OC4USB, Optically isolated interface cable for USB
VPS420-R High Working Voltage Probe, 100:1, Red and Black

Fluke. *Keeping your world up and running.®*

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