FLUKE®

ScopeMeter® Test Tool Innovation

# Introducing the complete 190 Series II

## Technical Data


### 190 Series II ScopeMeter Portable Oscilloscopes—the first high-performance scopes built for harsh industrial environments

Introducing the first high-performance portable oscilloscopes with 2 or 4 independently insulated input channels, an IP51 dust- and dripwater proof rating and a CAT III 1000 V/CAT IV 600 V safety rating. Choose from 500 MHz, 200 MHz, 100 MHz or 60 MHz bandwidth models. Now plant maintenance engineers can take a 2- or 4-channel scope into the harsh world of industrial electronics.

### 190 Series II—a new generation of Fluke ScopeMeter Oscilloscopes

The 190 Series II include these capabilities:

- Up to four independent floating isolated inputs, up to 1000 V
- Up to 5 GS/s real time sampling (depending on model and channels used)
- Deep memory: 10,000 points per trace waveform capture (scope mode)
- CAT III 1000 V/CAT IV 600 V safety rated instrument for industrial environments
- Up to seven hours of battery operation using BP291
- Isolated USB host port for direct data storage to a USB memory device; USB device port for easy PC communication
- Easy access battery door for quick battery swaps in the field
- Compact and only 2.2 kg (4.8 lb)
- Security slot: lock down oscilloscope with Kensington® lock while unattended
- IP51 rating, dust- and drip-proof
- Connect-and-View™ triggering for intelligent, automatic triggering on fast, slow and even complex signals
- Frequency spectrum using FFT-analysis
- Automatic capture and REPLAY of 100 screens
- ScopeRecord™ Roll mode gives 30,000 points per input channel for low frequency signal analysis
- TrendPlot™ paperless recorder mode with deep memory for long-term automatic measurements
- 5,000 count DMM included in the 2-channel models

1000 V CAT III
600 V CAT IV

1000 V CAT II
600 V CAT III

FLUKE ISO 9001

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# Oscilloscope modes

| | 190-062 | 190-102 | 190-202 | 190-104 | 190-204 | 190-504 |
|---|---|---|---|---|---|---|
| **Vertical deflection** | | | | | | |
| Number of channels | 2 | 2 | 2 | 4 | 4 | 4 |
| Bandwidth | 60 MHz | 100 MHz | 200 MHz | 100 MHz | 200 MHz | 500 MHz |
| Rise time | 5.8 ns | 3.5 ns | 1.7 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<br>Inputs may be activated in any combination | | | | | |
| Input coupling | AC or DC, with ground level indicator | | | | | |
| Input sensitivity | 2 mV/div to 100 V/div, plus variable attenuation | | | | | |
| Bandwidth limiter | User selectable: 10 kHz, or full bandwidth | | | | | |
| Normal/invert/variable | On each input channel, switched separately | | | | | |
| Input voltage | CAT III 1000 V/CAT IV 600 V rated, see General Specifications for further details | | | | | |
| Vertical resolution | 8 bit | | | | | |
| Accuracy | ± (2.1 % of reading + 0.04 x range/div) @ 5 mV/div to 100 V/div | | | | | |
| Input impedance | 1 MΩ ± 1 % // 14 pF ± 2 pF | | | | | |
| **Horizontal** | | | | | | |
| Maximum real-time sample rate (sampled simultaneously) | 625 MS/s for each channel | 1.25 GS/s for each channel | 2.5 GS/s (2ch) for each channel | 1.25 GS/s for each channel | 2.5 GS/s (2ch)<br>1.25 GS/s (4ch) | 5 GS/s (single channel) or 1.25GS/s per channel |
| 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 | 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<br>Slower time/division settings using ScopeRecord™ Roll mode (see 'Recorder mode') | | | | | |
| Maximum record length | 10,000 samples per channel in scope mode<br>30,000 points per channel in ScopeRecord™ Roll mode (see 'Recorder mode') | | | | | |
| Timing accuracy | ± (0.01 % of reading + 1 pixel) | | | | | |
| Glitch capture | 8 ns peak detect on each channel (using real time sampling and data compression, at any timebase setting) | | | | | |
| **Display and acquisition** | | | | | | |
| Display | 153 mm (6 in) full-color LCD with LED backlight | | | | | |
| 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 mathematical operation on any 2 input channels: add/subtract/multiply; X-Y-mode<br>Frequency Spectrum using FFT analysis | | | | | |
| Acquisition modes | Normal, Averaged, Auto, Single Shot, ScopeRecord™ roll, glitch capture, waveform compare with automatic "Pass/Fail testing"; Replay | | | | | |
| **Trigger and delay** | | | | | | |
| Source | Input A, B or External (via meter input) | | | Input A, B, C or D | | |
| Modes | Automatic Connect-and-View™, free run, single shot, edge, delay, dual slope, video, video line, selectable pulsewidth (channel A only), N-cycle | | | | | |
| 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. | | | | | |
| Video triggering (on ch. A) | NTSC, PAL, PAL+, SECAM; Includes field 1, field 2 and line select | | | | | |
| High-res, non-interlaced video | Non-interlaced video with line-select, for line frequencies in the range 14 kHz up to 65 kHz | | | | | |
| Pulse width triggering (on channel A) | Pulse width qualified by time<br>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 | | | | | |

| | |
|---|---|
| **Automatic capture of 100 screens** | |
| 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 | Two sets of 100 screens each can be saved internally for later recall and analysis.<br>Direct storage of additional sets on external flash memory drive through USB host port. |
| **FFT—frequency spectrum analysis** | |
| 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 |
| **Waveform compare and pass/fail testing** | |
| 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. |
| **Automatic scope measurements** | |
| 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 any 2 inputs), pulse width (pos./neg.), duty cycle (pos./neg.), temperature °C, temperature °F (not for Japan), dBV, dBm into 50 I and 600 I, $V_{PWM}$ ac and $V_{PWM}$(ac+dc) for measurement on pulse width modulated motor drives and frequency inverters, V/Hz ration (190-xx2 only) | |
| 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 |
| Advanced functions | mA*s (current-over-time, between cursors)<br>V*s (voltage over time, between cursors)<br>W*s (energy, between cursors) |
| **Cursor measurements** | |
| 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 |
| 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 | 190-104 | 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 | | | Up to 4 simultaneously | | |
| Maximum resolution | 5,000 counts | | | 999 counts | | |
| Input impedance | 1 MΩ ± 1 % // 14 pF ± 1.5pF | | | 1 MΩ ± 1 % // 15 pF ± 2 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<br>Add 10 % of specified accuracy for each degree C below 18 °C or above 28 °C | | | | | |
| **Voltage** | | | | | | |
| V dc accuracy | ± (0.5 % + 5 counts) | | | ± (1.5 % + 5 counts) | | |
| V ac true rms accuracy<br>15 Hz to 60 Hz:<br>60 Hz to 1 kHz:<br>60 Hz to 20 kHz: | ± (1 % + 10 counts)<br>± (2.5 % + 15 counts) | | | ± (1.5 % + 10 counts)<br>± (2.5 % + 15 counts) | | |
| V ac+dc true rms accuracy<br>15 Hz to 60 Hz:<br>60 Hz to 1 kHz:<br>60 Hz to 20 kHz: | ± (1 % + 10 counts)<br>± (2.5 % + 15 counts) | | | ± (1.5 % + 10 counts)<br>± (2.5 % + 15 counts) | | |
| Voltmeter ranges | 500 mV, 5 V, 50 V, 500 V, 1,000 V | | | | | |
| **Resistance** | | | | | | |
| Ranges | 500 Ω, 5 kΩ, 50 kΩ, 500 kΩ, 5 MΩ, 30 MΩ | | | — | | |
| Accuracy | ± (0.6 % + 5 counts) | | | — | | |
| **Other meter functions** | | | | | | |
| 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<br>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 modes

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| | 190-062 | 190-102 | 190-202 | 190-104 | 190-204 | 190-504 |
|---|---|---|---|---|---|---|
| **ScopeRecord™ Roll Mode** | | | | | | |
| Dual or multiple input waveform storage mode, using deep memory | | | | | | |
| Source and display | Input A, Input B, Dual<br>All channels sampled simultaneously | | | Any combination of inputs, up to 4 channels<br>All channels sampled simultaneously | | |
| Memory depth | 30,000 data points, 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<br>Start-on-Trigger (through external)<br>Stop-on-Trigger (through external) | | | Single sweep, continuous roll<br>Start-on-Trigger (through any channel)<br>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, at any record length | | | | | |
| Memory | Two multiple input ScopeRecord waveforms can be saved internally for later recall and analysis<br>Direct storage on external flash memory drive through USB host port | | | | | |
| **ScopeRecord™ Roll mode sample rate and recording timespan** | | | | | | |
| Time base range | 5 ms/div ~ 2 min/div | | | | | |
| Recorded timespan | 6 sec ~ 40 hr | | | | | |
| Time/division in 'view all' mode | 0.5 s/div ~ 4 h/div | | | | | |
| Glitch capture | 8 ns | | | | | |
| Sample rate | 125 MS/s | | | | | |
| Resolution | 200 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 measurement. 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<br>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 | | | | | |
| Recording mode | Continuous recording, starting at 5 s/div with automatic record 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<br>Direct storage on external flash memory drive through USB host port | | | | | |
| **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 | 190-104 | 190-204 | 190-504 |
|---|---|---|---|---|---|---|
| **Input voltage range** | | | | | | |
| 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 | CAT III 1000 V/CAT IV 600 V (Maximum voltage between 10:1 probe tip and reference lead) | | | | | |
| Probe input voltage VPS510 | CAT III 300 V (Maximum voltage between 10:1 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) | | | – | | |
| **Memory save and recall** | | | | | | |
| Memory locations (internal) | 30 waveform memories plus 10 recording memories plus 9 screen copy memories | | | | | |
| 15 waveform memory locations | Stores scope-trace waveform data (2 or 4 traces each) plus screen-copy plus corresponding setup | | | | | |
| Two recording memories | Each may contain:<br>• a 100 Screen Replay sequence, or<br>• a ScopeRecord Roll-mode recording (2 or 4 traces), or<br>• a TrendPlot recording of up to 4 measurements | | | | | |
| External data storage | • On PC, using FlukeView™ Software, or<br>• Direct storage on external flash memory drive (maximum 2 GB) through USB host port | | | | | |
| Screencopies | • On PC, using FlukeView™ Software, or<br>• Internally (in instrument) which can be copied on to external flash memory drive as .BMP-file, through USB host port | | | | | |
| Volatility | Measurement data is initially stored in RAM, which is maintained by the main battery with a 30 seconds back-up when battery is exchanged. When storing data, this is written in non-volatile flash-ROM. | | | | | |
| Real-time clock | Provides date and time stamp information for ScopeRecord, for 100 Screen Replay sequences and for TrendPlot recordings. | | | | | |
| **Case** | | | | | | |
| 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 according to MIL-PRF-28800F Class 2 | | | | | |
| Display size | 127 mm x 88 mm (153 mm/6.0 in diagonal) LCD | | | | | |
| Resolution | 320 x 240 pixels | | | | | |
| Contrast and brightness | User adjustable, temperature compensated | | | | | |
| Brightness | 200 cd/m$^2$ typical using power adapter, 90 cd/m$^2$ typical using battery power | | | | | |
| **Mechanical data** | | | | | | |
| Size | 265 mm x 190 mm x 70 mm (10.5 in x 7.5 in x 2.8 in) | | | | | |
| Weight (including battery) | 2.1 kg (4.6 lb) | | | 2.2 kg (4.8 lb) | | |
| **Power** | | | | | | |
| Line power | Mains adapter/battery charger BC190 included, version depending of country | | | | | |
| Battery power | Re-chargeable double capacity 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: 2400 mAh<br>[BP291 (4800 mAh) optional] | | | BP291: 4800 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 four hours using BP290 (included),<br>Up to eight hours using BP291 (optional) | | | Up to seven hours using BP291 (included) | | |
| Battery charging time | 2½ hours using BP290; 5 hours using BP291 | | | Five hours BP291 | | |
| Battery power saving functions | Auto 'power down' with adjustable power down time<br>Auto 'Display off' with adjustable power down time<br>On-screen battery power indicator | | | | | |
| **Safety** | | | | | | |
| Compliance | EN61010-1-2001, Pollution Degree 2;<br>CAN/CSA C22.2, No. 61010-1-04, with approval; UL61010B; ANSI/ISA-82.02.01 | | | | | |

| | 190-062 | 190-102 | 190-202 | 190-104 | 190-204 | 190-504 |
|---|---|---|---|---|---|---|
| **Environmental** | | | | | | |
| Operating temperature | 0 °C ~ +40 °C; 0 °C ~ +50 °C excluding battery | | | | | |
| Storage temperature | -20 °C ~ +60 °C | | | | | |
| Humidity | +10 °C ~ +30 °C: 95 % RH non-condensing<br>+30 °C ~ +40 °C: 75 % RH non-condensing<br>+40 °C ~ +50 °C: 45 % RH non-condensing | | | | | |
| Maximum operating altitude | Up to 2,000 m (6666 ft) for CAT IV 600 V/CAT III 1000 V<br>Up to 3,000 m (10,000 ft) for CAT III 600 V/CAT II 1000 V | | | | | |
| Maximum storage altitude | 12 km (40,000 ft) | | | | | |
| Electro-Magnetic-Compatibility (EMC) | EN 61326 (2005-12) for emission and immunity | | | | | |
| 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 2 GB) for storage of waveform data, complete datasets in which data and setup information is included, instrument settings and screen copies<br>A mini-USB-B is provided which allows for interconnection to PC for remote control and data transfer under PC-control. | | | | | |
| Probe calibration output | Dedicated probe-cal output with reference contact provided, fully insulated from any measurement input channel. | | | | | |
| Warranty | Three years (parts and labor) on main instrument, one year on accessories | | | | | |
| **Included accessories** | | | | | | |
| Battery charger/mains adapter | BC190 | | | | | |
| Li-Ion battery pack | BP290 (2400 mAh) | | | BP291 (4800 mAh) | | |
| Voltage probe sets (Each set includes ground lead, hook clip, ground spring and probe tip insulation sleeve) | VPS410-x (one red, one blue) | | | VPS410-x (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), Hangstrap, Handstrip (user selectable for left- or right hand use), Multi-language users manuals on CD-ROM, FlukeView® demo package (with restricted functionality), and USB interface cable for PC connectivity | | | | | |

## Ordering information

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### Models

| | |
|---|---|
| Fluke 190-504 | Color ScopeMeter, 500 MHz, 4 channels |
| Fluke 190-504/S | Color ScopeMeter, 500 MHz, 4 channels with SCC-290 kit included |
| Fluke 190-204 | Color ScopeMeter, 200 MHz, 4 channels |
| Fluke 190-204/S | Color ScopeMeter, 200 MHz, 4 channels, with SCC-290 kit included |
| Fluke 190-104 | Color ScopeMeter, 100 MHz, 4 channels |
| Fluke 190-104/S | Color ScopeMeter, 100 MHz, 4 channels, with SCC-290 kit included |
| Fluke 190-202 | Color ScopeMeter, 200 MHz, 2 channels plus DMM/Ext.input |
| Fluke 190-202/S | Color ScopeMeter, 200 MHz, 2 channels plus DMM/Ext.input, with SCC-290 kit included |
| Fluke 190-102 | Color ScopeMeter, 100 MHz, 2 channels plus DMM/Ext.input |
| Fluke 190-102/S | Color ScopeMeter, 100 MHz, 2 channels plus DMM/Ext.input, with SCC-290 kit included |
| Fluke 190-062 | Color ScopeMeter, 60 MHz, 2 channels plus DMM/Ext.input |
| Fluke 190-062/S | Color ScopeMeter, 60 MHz, 2 channels plus DMM/Ext.input, with SCC-290 kit included |

### Accessories

| | |
|---|---|
| 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 |
| VPS510-R | Electronic Voltage Probe set, 10:1, 500 MHz, one set red |
| VPS510-G | Electronic Voltage Probe set, 10:1, 500 MHz, one set grey |
| VPS510-B | Electronic Voltage Probe set, 10:1, 500 MHz, one set blue |
| VPS510-V | Electronic Voltage Probe set, 10:1, 500 MHz, one set green |
| VPS410-G | Industrial Voltage Probe set, 10:1, one set grey |
| VPS410-R | Industrial Voltage Probe set, 10:1, one set red |
| VPS410-B | Industrial Voltage Probe set, 10:1, one set blue |
| VPS410-V | Industrial Voltage Probe set, 10:1, one set green |
| VPS420-R | High working voltage ruggedized probe set, 100:1, 150 MHz (bicolored, red/black) |
| VPS420-G | High working voltage ruggedized probe set, 100:1, 150 MHz (bicolored, grey/black) |
| VPS420-B | High working voltage ruggedized probe set, 100:1, 150 MHz (bicolored blue/black) |
| VPS420-V | High working voltage ruggedized probe set, 100:1, 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 |

**Fluke.** *The Most Trusted Tools in the World.*

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