ScopeMeter® 190 Series:
Speed, performance and analysis power

For demanding applications, the ScopeMeter 190C and 190B Series high-performance oscilloscopes offer specifications usually found on top-end bench instruments. They’re ideal for engineers who need the full capabilities of a high-performance scope 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 (190C) or Black and White (190B) display
- High waveform resolution of 3000 datapoints per channel
- Digital Persistence for analyzing complex dynamic waveforms like on an analog scope (190C Series)
- Fast display update rate for seeing dynamic behavior instantaneously
- Connect-and-View™ automatic triggering, a full range of manual trigger modes plus external triggering
- Frequency Spectrum using FFT analysis (190C)
- 27,500 points per input record length using ScopeRecord™ mode
- Automatic capture and replay of 100 screens
- Four hours rechargeable NiMH battery pack
- 1,000V CAT II and 600V CAT III safety certified
- Up to 1,000V independently floating isolated inputs

ScopeMeter 120 Series:
Three-in-one simplicity

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. Quickly and easily find answers to problems in machinery, instrumentation, control and power systems.

- A dual input 40 MHz or 20 MHz digital oscilloscope
- Two 5,000 counts true-rms digital multimeters
- Cursor measurements (Fluke 124, 125)
- Bus Health Test for industrial bus systems (Fluke 125)
- A dual input TrendPlot™ recorder
- Connect-and-View™ trigger simplicity for hands-off operation
- Power Measurements and Harmonics measurement (Fluke 125)
- Shielded test leads for oscilloscope, resistance, continuity and capacitance measurements
- Up to seven hours battery operation
- 600V CAT III safety certified
- Optically isolated RS-232 interface
- Rugged, compact case
### Technical Specifications 190C and 190B Series

#### Oscilloscope Mode

**Vertical Deflection**

<table>
<thead>
<tr>
<th></th>
<th>Fluke 199C</th>
<th>Fluke 199B</th>
<th>Fluke 196C</th>
<th>Fluke 196B</th>
<th>Fluke 192B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bandwidth</td>
<td>200 MHz</td>
<td>100 MHz</td>
<td>60 MHz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rise time</td>
<td>1.7 ns</td>
<td>3.5 ns</td>
<td>5.8 ns</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bandwidth limiter</td>
<td>User selectable: 10 kHz, 20 MHz or off</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of inputs</td>
<td>2 plus external trigger. All inputs isolated from each other and ground.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input coupling</td>
<td>AC or DC, with ground level indicator</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input sensitivity</td>
<td>2 mV/div to 100 V/div (Fluke 190C Series); 5 mV/div to 100 V/div (Fluke 190B Series)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal/Invert</td>
<td>On both input channels; switched separately</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variable Attenuator</td>
<td>Variable Gain on input channel A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input voltage</td>
<td>1000V CAT II, 600 V CAT III rated - See ‘general specifications’ for further details.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vertical resolution</td>
<td>8 bit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accuracy</td>
<td>± (0.5% of reading + 0.04 x range/div)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input impedance</td>
<td>1 MO ± 1% // 15 pF ± 2 pF</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Horizontal**

<table>
<thead>
<tr>
<th></th>
<th>Fluke 199C</th>
<th>Fluke 199B</th>
<th>Fluke 196C</th>
<th>Fluke 196B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum real-time sample rate</td>
<td>2.5 GS/s</td>
<td>1 GS/s</td>
<td>500 MS/s</td>
<td></td>
</tr>
<tr>
<td>Number of digitizers</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Time base range</td>
<td>5 ns/div to 5 s/div</td>
<td>10 ns/div to 5 s/div</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum record length</td>
<td>3000 points per input in Scope-mode; 27,500 points per input in ScopeRecord™ roll mode (5 ms/div … 2 min/div)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accuracy</td>
<td>± (0.01% of reading + 1 pixel)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glitch capture</td>
<td>50 nsec (5 µsec/div to 1 min/div)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Display and Acquisition**

<table>
<thead>
<tr>
<th></th>
<th>Fluke 199C</th>
<th>Fluke 199B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display</td>
<td>144 mm</td>
<td>144 mm</td>
</tr>
<tr>
<td>Display modes</td>
<td>Digital Persistence: short / medium / long / infinite</td>
<td>Persistence on / off</td>
</tr>
<tr>
<td>Visible screen width</td>
<td>12 divisions in scope mode</td>
<td></td>
</tr>
<tr>
<td>Waveform Mathematics</td>
<td>A+B, A-B, A/B, all with user selectable scaling of resultant; A versus B (X-Y-mode); Frequency Spectrum using FFT analysis (190C only), Normal, auto, single shot, ScopeRecord™™, roll, glitch capture, waveform compare, waveform compare with automatic “Pass / Fail testing” in 199C and 196C only</td>
<td></td>
</tr>
<tr>
<td>Acquisition modes</td>
<td>Connect-and-View™™, free run, single shot, edge, delay, video, video line, selectable pulsewidth, dual slope (190C only), N-cycle (190C only)</td>
<td></td>
</tr>
</tbody>
</table>

**Trigger and Delay**

<table>
<thead>
<tr>
<th></th>
<th>Fluke 199C</th>
<th>Fluke 199B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source</td>
<td>Input A, input B, external trigger input. All input references isolated from each other and from ground.</td>
<td></td>
</tr>
<tr>
<td>Modes</td>
<td>Connect-and-View™™, free run, single shot, edge, delay, video, video line, selectable pulsewidth, dual slope (190C only), N-cycle (190C only)</td>
<td></td>
</tr>
</tbody>
</table>

### Automatic Capture of 100 Screens

- The instrument ALWAYS memorizes the last 100 screens (no user setup required). When an anomaly occurs on screen, the REPLAY button can be pressed to review the full screen sequence over and over. Instrument can be set up for triggering on glitches or intermittent anomalies and will operate in “baby-sit” mode and will capture 100 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**
    - Up to 2 sets of 100 screens each can be saved for later recall and analysis.

### FFT - Frequency Spectrum Analysis (190C only)

- Shows frequency content of oscilloscope waveform using Fast Fourier Transform
- Automatic, Hamming, Hanning or None
- **Window**
  - Digitaly re-samples acquired waveform to get optimum frequency resolution in FFT resultant
- **Vertical Scale**
  - Linear / Logarithmic, in volts
- **Frequency Axis**
  - Logarithmic; frequency range automatically set as function of timebase range of oscilloscope

### Waveform Compare and Pass/Fail Testing

- 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 ScopeMeter or externally using FlukeView Software.

- **Pass/Fail Testing (199C, 196C)**
  - In waveform compare mode, the Color ScopeMeter 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

- **Vdc, Vac rms, Vac+dc, Vpeak max, Vpeak min, Vpeak to peak, Aac, Adc, Aac+dc, frequency (Hz), risetime, falltime, power factor, Watts, VA, VA reactive, phase, pulsewidth (pos./neg.), dutycycle (pos./neg.), temperature °C, temperature °F, dPV, dBm into 50 Ω and 600 Ω
  - Vpeak, ac, Vpeak ac+dc for measurement on pulsewidth modulated motor drives and frequency inverters**
CURSOR MEASUREMENTS

Source Input A, input B or the Mathematical Result trace (excl. A vs B curve)
Dual horizontal lines Voltage at cursor 1 and 2, voltage between cursors
Dual vertical lines Time between cursors, \(1/T\) between cursors [in Hz], voltage between markers, falltime with markers, rms between cursors [190C only], Watts between cursors [190C only]
Single vertical line Min-Max and Average voltage at cursor position; Frequency and RMS-value of individual frequency component in FFT Result [190C only]

ZOOM
Up to 16x horizontal zoom

METER MODE
Via 4 mm banana inputs. Fully isolated from scope inputs and scope ground. The specified accuracy is valid over the temperature range 18 °C to 28 °C (65 °F to 82 °F).
Add 10% of specified accuracy for each degree C below 18 °C or above 28 °C.

MAXIMUM RESOLUTION
5,000 counts
Vdc ± (0.5% + 5 counts)
Vac true rms
15 Hz...60 Hz: ± (1% + 10 counts)
60 Hz...1 kHz: ± (2.5% + 15 counts)
Vac+dc true rms
dc...60 Hz: ± (1% + 10 counts)
60 Hz...1 kHz: ± (2.5% + 15 counts)

VOLTMETER RANGES
500mV, 5V, 50V, 500V, 1,000V

ACCURACY
Vac true rms
15 Hz...60 Hz: ± (1% + 10 counts)
60 Hz...1 kHz: ± (2.5% + 15 counts)
Vac+dc true rms
dc...60 Hz: ± (1% + 10 counts)
60 Hz...1 kHz: ± (2.5% + 15 counts)

OHMS
Ranges 500Ω, 5kΩ, 50kΩ, 500kΩ, 5MΩ, 30MΩ
Accuracy ± (0.6% + 5 counts)

OTHER METER FUNCTIONS
Continuity Beeper on < 50Ω (± 30Ω)
Diode test Up to 2.8V
Amps Adc, Aac, Aac+dc using an optional current clamp or shunt. Scaling factors: 0.1 mV/A ...
100 V/A
Temperature (°C, °F) With optional accessories. Scale factors 1 °C/mV or 1 °F/mV
Input impedance 1 MΩ ± 1% // 10 pF ± 2 pF
Advanced meter functions Auto/manual ranging, relative measurements [Zero reference], TrendPlot recording

RECORDING
Scope-Record-Mode Dual input waveform storage mode.
Scope-Record Roll Mode Source and display Input A, Input B, Dual
Memory depth 27,500 points per input.
Each point consist of Min-Max pair.
Min-Max values Min-Max values are measured at high sample rate ensuring capture and display of glitches.

Time base range | 5 ms/div to 1 min/div | 2 min/div
--- | --- | ---
Recorded timespan | 6 sec to 24 hr | 48 hr
Glitch capture | 50 ns | 250 ns
Sample rate | 20 MS/s | 4 MS/s
Resolution | 200 µsec to 2 sec | 4.8 sec

Recording modes Single sweep, continuous roll, Start-on-Trigger (through external), Stop-on-Trigger (through external)
Stop-on-Trigger (through External) ScopeRecord mode can be stopped by an individual trigger event, or by an interruption of a repetitive trigger signal.
Horizontal scale Time from start, time of day
Zoom Up to 100x
Memory Up to 2 dual input ScopeRecord waveforms can be saved for later recall and analysis.

TRENDPLOT™ RECORDING
Source and display Input A, Input B or DMM input
Memory depth 18,000 points record per input. Per record point a minimum, a maximum and an average value, plus a date- and timestamp are stored.

Ranges
- normal view 5 s/div to 30 min/div
- in view-all mode 5 min/div to 48 hr/div

Recorded timespan Up to 22 days with a resolution of 1 minute
Recording mode Continuous roll for the duration of the full recordable timespan
Measurement speed 5 measurements per second or more
Horizontal scale Time from start, time of day
Zoom Up to 64x zoom
Memory Up to 2 TrendPlot recordings can be saved for later recall and analysis.

CURSOR MEASUREMENTS - ALL RECORDER MODES
Source Input A, B or DMM input
Dual vertical lines Min-Max or Average voltage. Time between cursors
Single vertical line Min-Max or Average voltage. Absolute date and time from start
**GENERAL SPECIFICATIONS**

**INPUT VOLTAGE RATINGS**

Maximum probe voltage 1,000V CAT II, 600V CAT III  
(Maximum voltage between 10:1 probe tip (VPS200) and reference lead)

Floating voltage 1,000V CAT II, 600V CAT III  
(Maximum voltage between earth ground and any terminal (input or shielding))

Independently isolated inputs 1,000V CAT II, 600V CAT III  
(Maximum voltage between any terminal of one input or probe (VPS200) and any other terminal of another input or probe (VPS200))

Maximum voltage on BNC input directly (input A or B) 300V CAT III

Maximum voltage on meter input 1,000V CAT II, 600V CAT III

**MEMORY SAVE AND RECALL**

Scope memories 10 memory locations that each can contain two waveforms plus corresponding setup.

Recorder memories 2 memory locations that each can contain 100 captured dual input scope screens, or a dual input ScopeRecord (27,500 Min/Max pairs per input), or a dual input Trendplot (18,000 Min/Max pairs).

**REAL-TIME CLOCK**

Time and date stamp for ScopeRecord, 100 captured screens and TrendPlots.

**CASE**

Design Rugged, shock proof with integrated protective holster

Drip and dust proof IP51 according to IEC529

Shock and Vibration Shock 30g, Vibration (sinusoidal) 3g according to MIL-PRF-28800F Class 2.

Display Size 115.2 x 86.4 mm (4.54 x 3.4 inches)

Resolution 320 x 240 pixels

Contrast and brightness User adjustable, temperature compensated

**MECHANICAL DATA**

Size 256 x 169 x 64 mm (10.1 x 6.6 x 2.5 inches)

Weight 2 kg (4.4 lbs)

**POWER**

Line power Country specific line voltage adapter/battery charger included.

Battery power Rechargeable NiMH (installed)

Battery operating time 4 hours

Battery charging time 4 hours

Battery power saving functions Auto power down with adjustable power down time. On screen battery power indicator

**SAFETY**

Compliance EN61010-1-2001, Pollution Degree 2; UL3111-1, with approval; CAN/CSA C22.2, No. 61010-1-04, with approval; ANSI/ISA-82.02.01

**ENVIRONMENTAL**

Operating temperature 0 °C to +50 °C

Storage temperature -20 °C to +60 °C

Humidity 10 °C to 30 °C: 95% RH non condensing  
30 °C to 40 °C: 75% RH non condensing  
40 °C to 50 °C: 45% RH non condensing

Maximum operating altitude 3,000 m (10,000 feet)

Maximum storage altitude 12 km (40,000 feet)

**ELECTRO-MAGNETIC COMPATIBILITY (EMC)**

EN 61326-1 for emission and immunity

**OPTICALLY ISOLATED PC/PRINTER INTERFACE**

To printer Supports HP Laserjet®, DeskJet, Epson FX/LQ, Seiko DPU-414 and Postscript printers via optional PAC 91

To PC Transfer instrument settings, screen images and waveform data, compatible with FlukeView® software for Windows® via optional OC4USB or PM9080.

**WARRANTY**

3 years (parts and labor) on main instrument, 1 year on accessories.

![UL][306x681] [CSA][306x681]
### Technical Specifications ScopeMeter 120 Series

#### OSCILLOSCOPE MODE

<table>
<thead>
<tr>
<th>Vertical Deflection</th>
<th>Fluke 125, 124</th>
<th>Fluke 123</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bandwidth and risetime</td>
<td>40 MHz</td>
<td>20 MHz</td>
</tr>
<tr>
<td>• with VPS40 probes</td>
<td>40 MHz</td>
<td>20 MHz</td>
</tr>
<tr>
<td>• input A and B directly</td>
<td>12.5 MHz</td>
<td>12.5 MHz</td>
</tr>
<tr>
<td>• with STL120 Shielded Test Leads</td>
<td>8.75 ns</td>
<td>17.5 ns</td>
</tr>
</tbody>
</table>

#### TRIGGER AND DELAY

- Source: Input A, Input B, external via ITP120
- Modes: Automatic Connect-and-View™, Free Run, Edge, Single Shot, Video, Video Line
- Connect-and-View™: Advanced automatic triggering that recognizes signal patterns and automatically sets up and continuously adjusts triggering, time base and amplitude. Automatically displays stable pictures of complex and dynamic signals like motor drive and control signals.

#### MEASUREMENTS

- **VDC, VAC**
- **Vpeak max, Vpeak min**
- **Vpeak to peak, frequency (Hz)**
- **positive pulse width, negative pulse width, positive pulse cycle, negative pulse cycle, Amp AC, Amp DC, Amp AC+DC, Phase, Temperature °C, Temperature °F, dBV, dBm into 50Ω and 600Ω**

#### BUS HEALTH TESTER (Fluke 125 only)

Bus Health automatically analyzes the electrical signals on the network to give waveform data and measure individual parameters. Automatic comparison of the measurement results to standards, results in 'good' or 'false' indicators to be displayed per parameter.

#### POWER MEASUREMENTS (Fluke 125 only)

- **Measure Types**: Watt, VA, VAR, Power Factor (PF)
- **Power Configuration**: Single phase or Balanced 3-phase
- **Voltage Measurement**: Channel A, using STL120, voltage probe or direct input
- **Current Measurement**: Channel B, using 1000:1 current clamp (included) or other compatible clamp

#### CURSOR MEASUREMENTS (Fluke-124 and -125 only)

- **Sources**: Input A, Input B
- **Modes**: Single or dual vertical cursor, dual horizontal cursor, rise- or falltime

#### HARMONICS MODE (Fluke 125 only)

Converts waveform information into harmonics display using FFT processing, which shows the relative amplitudes of the 1st up to the 33rd harmonic.

#### VERTICAL DEFLECTION

<table>
<thead>
<tr>
<th>Fluke 125, 124</th>
<th>Fluke 123</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of inputs</td>
<td>2</td>
</tr>
<tr>
<td>Input coupling</td>
<td>AC, DC with ground level indicator</td>
</tr>
<tr>
<td>Input sensitivity</td>
<td>5 mV ... 500 V/div (with included VPS40 (Fluke 125, 124) and STL120 shielded test leads measure up to 600Vrms CAT III)</td>
</tr>
<tr>
<td>Vertical resolution</td>
<td>8 bit</td>
</tr>
<tr>
<td>Accuracy</td>
<td>± [1% of reading + 0.05 x range/div]</td>
</tr>
<tr>
<td>Input impedance</td>
<td>1 MΩ ± 1% // 15.5 pF with VPS40 (Fluke 125, 124) and STL120 shielded test leads</td>
</tr>
<tr>
<td>Accuracy</td>
<td>± 1% // 225 pF with STL120 (Amps, °C or °F with optional probes)</td>
</tr>
<tr>
<td>Vertical resolution</td>
<td>8 bit</td>
</tr>
<tr>
<td>Accuracy</td>
<td>± 0.1% of reading + 1 pixel</td>
</tr>
<tr>
<td>Input sensitivity</td>
<td>5 mV ... 500 V/div</td>
</tr>
<tr>
<td>Input coupling</td>
<td>AC, DC with ground level indicator</td>
</tr>
</tbody>
</table>

#### DISPLAY AND ACQUISITION

- **Display modes**: Input A, Input A and B, envelope, smooth
- **Acquisition modes**: Normal, single shot, roll, glitch capture (always on)
- **Number of digitizers**: 2
- **Time base range**: 10 ns/div to 1 min/div (Fluke 125, 124); 20 ns/div to 1 min/div (Fluke 123)
- **Maximum record length**: 512 Min-Max points per input
- **Glitch detect**: 40 ns

#### MEASUREMENTS

- **Vpeak to peak, frequency (Hz)**
- **dBV, dBm into 50Ω and 600Ω**
- **Amp AC, Amp DC, Amp AC+DC, Phase, Temperature °C, Temperature °F**
- **(Amps, °C or °F with optional probes)**

#### Harmonics Frequency range: DC...33rd harmonic

- **Display**: Bargraph showing 1st up to 33rd harmonic and DC, amplitude displayed in % relative to fundamental
- **Timebase setting**: 5 ms/div
- **Measurements**: Relative amplitude of individual harmonic; THD in % or dB

#### BUS HEALTH TESTER (Fluke 125 only)

Bus Health automatically analyzes the electrical signals on the network to give waveform data and measure individual parameters. Automatic comparison of the measurement results to standards, results in 'good' or 'false' indicators to be displayed per parameter.

#### Bus types and reference standards used:

- AS-i [EN50295, 166 kb/s]
- CAN-bus [ISO-11898, up to 1 Mb/s]
- Interbus S [EIA-485, up to 10 Mb/s]
- ControlNet [61158 type 2, 5 Mb/s]
- Modbus [EIA-485 up to 115 kb/s and EIA-485 up to 10 Mb/s]
- Foundation Fieldbus H1 [61158 type 1, 31.25 kb/s and H2 [61158 type 1, up to 10 Mb/s]
- Profibus DP [EIA-485 up to 10 Mb/s and PA [61158 type 1, 31.25 kb/s]
- Ethernet [10Base2 (coaxial) and 10BaseT (UTP)], 10 Mb/s
- RS-232 [EIA-232, up to 115 kb/s]
- RS-485 (EIA-485, up to 10 Mb/s)

#### Harmonics (Fluke 125 only)

- **Display**: Bargraph showing 1st up to 33rd harmonic and DC, amplitude displayed in % relative to fundamental
- **Timebase setting**: 5 ms/div
- **Measurements**: Relative amplitude of individual harmonic; THD in % or dB

#### Technical Datasheet Fluke ScopeMeters 5
### DUAL INPUT METER

The specified accuracy is valid over the temperature range 18 °C to 28 °C (65 °F to 82 °F). Add 10% of specified accuracy for each degree C below 18 °C or above 28 °C.

**Max. meter bandwidth**
- 40 MHz (for Fluke 125, 124)
- 20 MHz (for Fluke 123)

**V<sub>DC</sub>**
- Ranges: 500mV, 5V, 50V, 500V, 1.250V
- Max. Resolution: 5,000 counts
- Accuracy: ±(0.5% + 5 counts)

**V<sub>AC RMS</sub>**
- Ranges: 500mV, 5V, 50V, 500V, 1.250V
- Max. Resolution: 5,000 counts
- Accuracy: 1 Hz, 60 Hz: ±(1% + 10 counts)
- 60 Hz...1 kHz: ±(2.5% + 15 counts)
- 20 kHz...1 MHz: ±(5% + 20 counts)

**V<sub>AC PWM</sub>**
Measures the effective output voltage of pulse-width modulated motor drives and frequency inverters (Fluke 125 only)

**V<sub>AC+DC TRUE RMS</sub>, A<sub_DC</sub>**
- Ranges: 500mV, 5V, 50V, 500V, 1.250V
- Max. Resolution: 5,000 counts
- Accuracy: DC ... 60 Hz: ±(1% + 10 counts)
- 60 Hz...1 kHz: ±(2.5% + 15 counts)
- 20 kHz...1 MHz: ±(5% + 20 counts)

**OHMS**
- Ranges: 500Ω, 5kΩ, 50kΩ, 500kΩ, 5MΩ, 30MΩ (all models); 50Ω (Fluke 125 only)
- Max. Resolution: 5,000 counts
- Accuracy: ±(0.6% of reading + 5 counts)

**CAPACITANCE**
- Ranges: 50 nF ... 500µF
- Max. Resolution: 5,000 counts
- Accuracy: ±(2% of reading + 10 counts)

**OTHER METER FUNCTIONS**
- Frequency: Up to 70 MHz (Fluke 125, 124) and up to 40 MHz (Fluke 123)
- Rotational speed (rpm): Revolutions per minute, based on 1, 2 or 4 or 8 pulses per 2 revolutions (Fluke 125 only)
- Max. RPM reading: 50 kHz
- Continuity: Beeper on < 30Ω
- Diode test: Up to 2.8V
- Amps: Amp DC, Amp AC, Amp AC+DC using an optional current clamp or shunt.
- Duty Cycle: 2% to 98%, up to 30 MHz
- Temperature (°C, °F): With optional accessories. Scale factors 1 mV/°C or 1 mV/°F
- Number of inputs: 2
- Input impedance: 1MO ± 1% // 10 pF ± 2 pF
- Advanced meter functions: Auto/manual ranging, TouchHold®, Relative measurements (zero reference)

**RECORER MODE**

**TRENDPLOT™ RECORDING**
- Dual input electronic paperless chart recorder.
- Plots and displays the actual, minimum, maximum and average of any measurement.
- Input A, Input A and B
- Ranges: 15 divisions per minute (automatic)
- Recorded timespan: Up to 16 days with a resolution of 1.5 hours
- Recording mode: Continuous with automatic vertical scaling and horizontal time compression
- Measurement speed: 2.5 measurements per second maximum
- Horizontal scale: Time from start

**GENERAL SPECIFICATIONS**

**CASE**
- Design: Rugged, shock proof with integrated protective holster
- Power: DIP 3 according to IEC629
- Shock: 30g according to MIL-PRF-28800F, Class 2, par. 3.8.4.2 and 4.5.5.3.1
- Vibration: 3g according to MIL-PRF-28800F, Class 2, par. 3.8.5.1 and 4.5.5.4.1

**DISPLAY**
- Bright LCD with CCF1 backlight, 35/60 cd/m² without/with adapter
- Size: 72 x 72mm (2.8 x 2.8 inch)
- Resolution: 240 x 240 pixels
- Contrast and brightness: User adjustable, temperature compensated

**MEMORY SAVE AND RECALL**
- 20 (Fluke 125, 124) and 10 (Fluke 123) instrument screens with user set-ups and user text can be saved.

**REAL-TIME CLOCK**
- Time and date stamp TrendPlot recording

**POWER**
- Line power: Country specific line voltage
- Battery power: Rechargeable Ni-MH BP120MH (installed)
- Battery charging time: 7 hours
- Battery operating time: Up to 7 hours using BP120MH
- Auto power down with adjustable power down time. On screen battery power indicator

**MECHANICAL DATA**
- Size: 50 x 115 x 232 mm (2 x 4.5 x 9.1 inches)
- Weight: 1.2 kg (2.5 lb.)

**SAFETY**
- Compliance: EN61010-1-2001, Pollution Degree 2;
- Safety: CAN/CSA C22.2 No. 61010-1-04 including CAN/CSA-US-124.05; ANSI/ISA S82.01.

**INPUT VOLTAGE RATINGS**
- Maximum input voltage: 600V CAT III (Maximum voltage between input and reference lead)
- Maximum input voltage using VP940 Probe: 600V CAT III, 1000 V CAT II (Maximum voltage between probe tip input and reference lead)
- Floating voltage: 600V CAT III (Maximum voltage between earth ground and any terminal signal input or reference lead)
- Maximum voltage between reference leads: Instrument has common grounds connected via selfrecovering fault protection. For different ground potential measurements between inputs use DP120 differential voltage probe.

**ENVIRONMENTAL**
- According MIL-PRF-28800F, Class 2
- Operating Temperature: 0°C to +50°C
- Storage temperature: -20°C to +60°C
- Humidity: 10% to 30°C, 95% RH non condensing
- 30°C to 40°C, 75% RH non condensing
- 40°C to 50°C, 45% RH non condensing
- Maximum operating altitude: 2,000m (6,500 feet)
- Maximum storage altitude: 4,500m (15,000 feet) voltages ≤ 400V
- Maximum voltage between earth ground and any terminal signal input: 12 km (40,000 feet)
- Compatibility (EMC): EN61326-1 for emissions and immunity

**OPTICALLY ISOLATED PC/PRINTER INTERFACE**
- Tb printer: Supports HP Laserjet, Deskjet, Epson FX/LQ and postscript printers via optional PAC91
- Tb PC: Transfer instrument settings, screen images and data, compatible with FlukeView+ software for Windows- via optional OC4USB (USB) or P05080 (RS-232) interface cable.

**WARRANTY**
- 3 years (parts and labor) on main instrument,
- 1 year on accessories

Technical Datasheet Fluke ScopeMeters 6
FlukeView® ScopeMeter® Software

FlukeView ScopeMeter software helps you get more out of your ScopeMeter:

- Store instrument’s screen copies on the PC, in color (with Fluke 190C-Series only) or in black & white
- Copy screen images into your reports and documentation
- Create and archive waveform references for automatic (Fluke 190C Series) or visual (Fluke 190B and 190C Series) comparison
- Includes waveform analysis, e.g., FFT spectrum analysis
- Copy waveform data into your spreadsheet for detailed analysis
- Use cursors for parameter measurement
- Extended recording of up to four user-selected measurements help you monitor and analyze slow moving signals and related events
- Logging of other readings directly into other application programs, e.g., spreadsheet
- Add user text to instrument setups and send these to the instrument for operator reference and instructions
- Capture complete Replay sequence into the PC for further analysis and documentation
- English, French and German versions included on a single CD-ROM

System requirements

- Pentium 90 or better
- CD-ROM drive
- Windows® 95 / 98 / Me / NT 4.0 / 2000 / XP
- One free RS 232 or USB port
- PM9080 Optically isolated RS232 adapter/cable, or:
- OC4USB Optically isolated USB interface adapter/cable, available separately or included in SCC120 / SCC190 kit and in ScopeMeter ‘S’ versions

Supported Instruments

Full support for Fluke 199C, 199B, 199, 196C, 196B, 196, 192B, 192, 124 and 123. Starting release V4.4, the Fluke 125 is supported.

Earlier ScopeMeter models are supported by means of an earlier release of FlukeView, included on the same CD-ROM.

Accessories

<table>
<thead>
<tr>
<th>Standard Accessories</th>
<th>Fluke 199C, 199B, 196C, 196B, 192B</th>
<th>Fluke 125, 124, 123</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rechargeable battery pack (installed)</td>
<td>BP190</td>
<td>BP120MH</td>
</tr>
<tr>
<td>Line voltage adapter / Battery charger</td>
<td>BC190</td>
<td>PM8907</td>
</tr>
<tr>
<td>Voltage probes (1 set red, 1 set grey) and accessories</td>
<td>10:1 voltage probe (VPS200) including hook clip, ground lead with hook clip, ground lead with mini alligator clip, 4 mm add-on probe tip, ground lead to 4 mm banana plug</td>
<td>STL120 Shielded Test lead set, VPS40 high impedance 10:1 probe, 40 MHz (1 black, included with Fluke 125 &amp; 124); HC120 hook clips; ground leads with mini alligator clips, AC120 alligator clips; BB120 BNC-to-Shielded-banana adapter</td>
</tr>
<tr>
<td>Multimeter testleads</td>
<td>TL75 Hard Point testlead set (1 red, 1 black)</td>
<td>TL75 Hard Point test lead (1 black)</td>
</tr>
<tr>
<td>Current clamp</td>
<td>--</td>
<td>400s current clamp</td>
</tr>
<tr>
<td>User manual</td>
<td>10 language versions on CD-ROM, “Getting Started” booklet included with instrument</td>
<td>15 language versions on CD-ROM, “Getting Started” booklet included with instrument</td>
</tr>
</tbody>
</table>

Next to the above standard accessories, Fluke offers a wide range of optional accessories like temperature probes, current clamps, high voltage probes, cables, adapters and carrying cases to further assist you in your job. See the Fluke web-site or contact your distributor for details.

SCC190 and SCC120 – Software, Case, Cable kits

For user’s safety, the Fluke ScopeMeters are connected to a PC or printer using an optically isolated interface cable. Software and cable can be ordered separately, or as part of a special value kit: the SCC190 or the SCC120 kit. Each of these include a protective hard shell carrying case (model depending on the ScopeMeter model) for safe and convenient storage of instrument and accessories, the FlukeView ScopeMeter Software for Windows and the OC4USB-interface cable. For those who prefer an RS-232 link, an optically isolated RS-232 cable PM9080 is available as separate item.
<table>
<thead>
<tr>
<th>Color ScopeMeter</th>
<th>190C Series</th>
<th>ScopeMeter</th>
<th>190B Series</th>
<th>ScopeMeter</th>
<th>120 Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluke 190C</td>
<td></td>
<td>Fluke 190B</td>
<td></td>
<td>Fluke 125</td>
<td></td>
</tr>
<tr>
<td>Fluke 190C/S</td>
<td></td>
<td>Fluke 190B</td>
<td></td>
<td>Fluke 124</td>
<td></td>
</tr>
<tr>
<td>Fluke 190B</td>
<td></td>
<td>Fluke 190B</td>
<td></td>
<td>Fluke 123</td>
<td></td>
</tr>
<tr>
<td>Bandwidth</td>
<td>200 MHz</td>
<td>200 MHz</td>
<td>200 MHz</td>
<td>40 MHz</td>
<td>40 MHz</td>
</tr>
<tr>
<td></td>
<td>100 MHz</td>
<td>100 MHz</td>
<td>100 MHz</td>
<td>40 MHz</td>
<td>40 MHz</td>
</tr>
<tr>
<td>Max. real time sample rate</td>
<td>2.5 GS/s</td>
<td>2.5 GS/s</td>
<td>2.5 GS/s</td>
<td>2.5 MS/s</td>
<td>2.5 MS/s</td>
</tr>
<tr>
<td>Max. equivalent time sample rate</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Display</td>
<td>14.4 cm Full Color LCD</td>
<td>14.4 cm Monochrome LCD</td>
<td>10.2 cm Monochrome LCD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. record length</td>
<td>3000 points per input channel, allowing for high time resolution signal analysis using zoom</td>
<td>27,500 points per input or more (5 ms/div...2 min/div)</td>
<td>512 min/max points per input</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of inputs</td>
<td>2 plus external / DMM input, isolated from each other and from ground</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of digits</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input sensitivity</td>
<td>2 mV/div. ... 100 V/div.</td>
<td>5 mV/div. ... 100 V/div.</td>
<td>5 mV/div. ... 500 V/div.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Timebase range in Scope mode</td>
<td>5 ns/div. to 2 min/div.</td>
<td>10 ns/div. ... 1 min/div.</td>
<td>20 ns/div. ... 1 min/div.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trigger types</td>
<td>Connect-and-View™, Free Run, Single Shot, Edge, Delay, Video Frame, Video Line</td>
<td>Connect-and-View™, Free Run, Single Shot, Edge, Video Line</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scope Measurements</td>
<td>7 cursors measurements, 30 automatic measurements</td>
<td>7 cursors + waveformlimited part of waveform</td>
<td>7 cursors + waveformlimited part of waveform</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bus Health Test function</td>
<td>-</td>
<td>For standard industry buses</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waveform Mathematics</td>
<td>A + B, A - B, A versus B (X-Y-mode, giving Lissajous diagrams)</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power Measurements</td>
<td>P (W), VA, VAR, PF</td>
<td>Power, VA, VAR, PF, RPM, Vpwm, THD</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scope-Record Trigger modes</td>
<td>Start on Trigger, Stop on Trigger</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dual input TrendPlot</td>
<td>Automatic, with playback capability</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Memory for recordings</td>
<td>5 more memories are made available upon registration of the ScopeMeter</td>
<td>Dual fully featured 8000 counts DMM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>True RMS millimeter</td>
<td>5000 counts, Volts, Amps, Ohms, Continuity, Diode, Temp</td>
<td>Dual fully featured 8000 counts DMM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety certified (EMC61010-1)</td>
<td>1000 V CAT II / 600 V CAT III (instrument and included accessories)</td>
<td>600 V CAT III (instrument and included accessories)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Battery (installed)</td>
<td>4 hr Ni-MH BP190</td>
<td>7 hr Ni-MH BP120M</td>
<td>7 hr Ni-MH BP120M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Line power</td>
<td>Adapter / battery-charger included (BC190)</td>
<td>Adapter / battery charger included (BC190)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size (cm)</td>
<td>25.6 x 16.9 x 6.4 cm</td>
<td>23.2 x 11.5 x 5.0 cm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>2 kg</td>
<td>1.2 kg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PC and Printer interface</td>
<td>Using optional Optically isolated adapter / cable OC4USB [USB] or PM9080 [RS-232]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warranty</td>
<td>3 years on main instrument, 1 year on the standard accessories</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Ordering Information**

Fluke 190C Color ScopeMeter (200 MHz / 2.5 GS/s)  
Fluke 190C/S Color ScopeMeter (200 MHz / 2.5 GS/s + SC190)  
Fluke 190C Color ScopeMeter (200 MHz / 1 GS/s)  
Fluke 190C/S Color ScopeMeter (200 MHz / 1 GS/s + SC190)  
Fluke 190B ScopeMeter (200 MHz / 2.5 GS/s)  
Fluke 190B/S ScopeMeter (200 MHz / 2.5 GS/s + SC190)  
Fluke 190B ScopeMeter (200 MHz / 1 GS/s)  
Fluke 190B/S ScopeMeter (200 MHz / 1 GS/s + SC190)  
Fluke 190B ScopeMeter (60 MHz / 500 MS/s)  
Fluke 190B/S ScopeMeter (60 MHz / 500 MS/s + SC190)  
Fluke 125 Industrial ScopeMeter (40 MHz)  
Fluke 125/S Industrial ScopeMeter (40 MHz + SC120) kit  
Fluke 124 Industrial ScopeMeter (40 MHz)  
Fluke 124/S Industrial ScopeMeter (40 MHz + SC120) kit  
Fluke 123 Industrial ScopeMeter (20 MHz)  
Fluke 123/S Industrial ScopeMeter (20 MHz + SC120) kit  
SC190 FlukeView® Software + Cable + Case (190 Series)  
SC120 FlukeView® Software + Cable + Case (120 Series)  
P86080 Optically Isolated RS-232 adapter/cable  
O840S0 Optically Isolated USB interface cable  
ITP120 Optically Isolated External Trigger Input for Fluke 120 series  
SW90W FlukeView® ScopeMeter Software for Windows®  
C180 Hard Shell Carrying Case for Fluke 190 series  
C120 Hard Shell Carrying Case for Fluke 120 series

- All ScopeMeter test tools come standard with a complete accessory package including line voltage adapter and battery pack (installed)  
- ScopeMeter 190B and 190C series come with probes, probe accessories and multimeter test leads  