ScopeMeter® 190C/190B Series and ScopeMeter® 120 Series

Technical Data

ScopeMeter 190C and 190B 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. With up to 200 MHz bandwidth, 2.5 GS/s real time sampling and a deep memory of 27,500 points per input they’re ideal for engineers who need the full capabilities of a high-performance scope in a hand-held, battery powered instrument.

- Dual input - 200, 100 or 60 MHz bandwidth
- Up to 2.5 GS/s real time sampling per input
- Connect-and-View™ automatic triggering, a full range of manual trigger modes plus external triggering
- Digital Persistence for analyzing complex, dynamic signals like on an analog oscilloscope (190C)
- Fast display update rate for seeing dynamic behavior instantaneously
- Automatic capture and replay of 100 screens
- 27,500 points and more per input record length using ScopeRecord™ mode
- TrendPlot™ paperless recorder for trend analysis up to 22 days
- 1,000 V CAT II and 600 V CAT III safety certified
- Waveform reference for visual comparison and automatic pass/fail testing (190C) of waveforms
- Up to 1,000 V independently floating isolated inputs
- Four hours rechargeable NiMH battery pack

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. Find fast 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)
- A dual input TrendPlot recorder
- Connect-and-View trigger simplicity for hands-off operation
- Shielded test leads for oscilloscope, resistance, continuity and capacitance measurements
- Full bandwidth, VPS40 10:1 40 MHz probe included standard with Fluke 124
- Up to seven hours battery operation
- 600 V CAT III safety certified
- Optically isolated RS-232 interface
- Rugged, compact case
Oscilloscope Mode

### Vertical Deflection

<table>
<thead>
<tr>
<th>Feature</th>
<th>Fluke 190C</th>
<th>Fluke 190B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bandwidth</td>
<td>200 MHz</td>
<td>100 MHz</td>
</tr>
<tr>
<td>Rise time</td>
<td>1.7 ns</td>
<td>3.5 ns</td>
</tr>
<tr>
<td>Bandwidth limiter</td>
<td>User selectable: 10 kHz, 20 MHz or off</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>
</tr>
<tr>
<td>Input coupling</td>
<td>AC or DC, with ground level indicator</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>
</tr>
<tr>
<td>Input voltage</td>
<td>1000 V CAT II, 600 V CAT III rated - See &quot;general specifications&quot; for further details</td>
<td></td>
</tr>
<tr>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Input voltage</td>
<td>1000 V CAT II, 600 V CAT III rated - See &quot;general specifications&quot; for further details</td>
<td></td>
</tr>
<tr>
<td>Vertical resolution</td>
<td>8 bit</td>
<td></td>
</tr>
<tr>
<td>Accuracy</td>
<td>±(1.5% of reading + 0.04 x range/div)</td>
<td></td>
</tr>
<tr>
<td>Input impedance</td>
<td>1 MΩ ± 1% // 15 pF ± 2 pF</td>
<td></td>
</tr>
</tbody>
</table>

### Horizontal

<table>
<thead>
<tr>
<th>Feature</th>
<th>Fluke 190C</th>
<th>Fluke 190B</th>
<th>Fluke 196C</th>
<th>Fluke 196B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum record length</td>
<td>1,200 points per input in Scope mode; 27,500 points per input in ScopeRecord™ roll mode (5 ms/div to 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 (at 5 us/sec/div to 1 min/div); 250 nsec (at 2 min/div)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Display and Acquisition</td>
<td>144 mm (5.67&quot;) full color LCD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Display modes</td>
<td>Input A, Input B, dual, average, invert, replay, Digital Persistence mode (short/medium/long/infinite)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vpwm ac</td>
<td>Up to 8x horizontal zoom</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 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.

### Video triggering
NTSC, PAL, PAL+, SECAM. Includes field 1, field 2 and line select.

### Pulse width triggering
Pulse width qualified by time. Allows for triggering <t, >t, =t, where t is selectable in minimal steps of 0.01 div. or 50 nsec.

### Time delay
One full screen of pre-trigger view or up to 100 screens (1200 divisions) of post-trigger delay

### Automatic Capture of 100 Screens
The instrument ALWAYS memorizes last 100 screens (no user interaction or setup required). When an anomaly occurs on screen, the HOLD 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.

Alternatively, the 199C and 196C can be set up in waveform compare mode to store only matching ("Pass") or only non-matching ("Fail") acquired waveforms.

### Waveform Compare and Pass/Fail Testing
Provided 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, pulse width [pos/neg], duty cycle [pos/neg], temperature °C, temperature ℃, °C, °F, °D, °F in 50 Ω and 600 Ω

### Cursor Measurements
Source: Input A, input B or the Mathematical Result trace

#### 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, risetime with markers, falltime with markers

#### Single vertical line
Min–Max and Average voltage at cursor position

### Zoom
Up to 8x 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

**Voltmeter Ranges**: 500 mV, 5 V, 50 V, 500 V, 1,000 V

**Accuracy**:

- 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)

**Ohms**:

**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
- **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 mV/°C or 1 mV/°F
- **Input impedance**: 1 MΩ ± 1% // 10 pF ± 2 pF
- **Advanced meter functions**: Auto/manual ranging, relative measurements (Zero reference), TrendPlot recording

**Recorder Mode**

**ScopeRecord-Roll Mode**

Dual input waveform storage mode

**Source and display**: Input A, Input B, Dual

**Memory depth**: 27,500 points per input or more.

Each point consists of Min–Max pair

**Min–Max values**: Min–Max values are measured at high sample rates ensuring capture and display of glitches

**Time base range**: 5 ms/div to 1 min/div

- **Recorded timespan**: 6 sec to 24 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, Stop-on-Trigger

**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 ScopeRecord waveforms can be saved for later recall and analysis

**TrendPlot™ recording**

Single or dual input electronic paperless chart recorder. Plots, displays and stores meter and scope measurements.

**Source and display**: Input A, Input B or DMM input

**Memory depth**: 18,000 points recording. Per record point a minimum, a maximum and an average value, plus a date and timestamp are recorded.

**Ranges**: 5 s/div to 30 min/div in normal view mode; 5 min/div to 48 hr/div in view all mode, giving overview of total record

**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

**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 or time from start

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**Fluke Corporation**

ScopeMeter 190C/190B Series and ScopeMeter 120 Series
General Specifications

**Case**

**Design:** Rugged, shock proof with integrated protective holster

**Drip and dust proof:** IP51 according to IEC529

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

<table>
<thead>
<tr>
<th>Display</th>
<th>Fluke 199C, 196C</th>
<th>Fluke 199B, 196B, 192B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display size:</td>
<td>115.2 x 86.4 mm (4.54 x 3.4 in.)</td>
<td>Bright full-color LCD with CCFL backlight, 80 (30) Cd/m² with (without) power adapter</td>
</tr>
<tr>
<td>Resolution:</td>
<td>320 x 240 pixels</td>
<td>Bright monochrome LCD with CCFL backlight, 125 (75) Cd/m² with (without) power adapter</td>
</tr>
</tbody>
</table>

**Display**

**Contrast and brightness:** User adjustable, temperature compensated

**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 + average values)

**Real-Time Clock**

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

**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

**Mechanical Data**

**Size:** 256 x 169 x 64 mm (10.1 x 6.6 x 2.5 in)

**Weight:** 2 kg (4.4 lbs)

**Safety**

**Compliance:**

- EN61010-1 (1993) Pollution degree 2
- UL 3111-1 (1994)
- CAN/CSA C22.2 No.1010.1 (1992)
- ANSI/ISA S82.01 (1994)

**Input Voltage Ratings**

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

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

**Independently isolated inputs:** 1,000 V CAT II/600 V 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): 300 V CAT III

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

**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**

**PC communication:** Transfer instrument settings, screen images, waveform data and waveform references, compatible with FlukeView® software for Windows® via optional PM9080.

**To printer:** Supports HP Laserjet®, DeskJet, Epson FX/LQ and Postscript printers via optional PAC 91

**Warranty**

3 years, parts and labor on mainframe instrument
1 year on accessories

### Accessories

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rechargeable battery pack (installed)</td>
<td>BP190</td>
</tr>
<tr>
<td>Line voltage adapter / Battery charger</td>
<td>BC190</td>
</tr>
<tr>
<td>Voltage probes and accessories</td>
<td>10:1 voltage probe (VPS200, 1 red + 1 grey) including hook clip, ground lead with mini alligator clip, ground lead with hook clip, 4 mm add-on probe tip, ground lead to 4 mm banana plug</td>
</tr>
<tr>
<td>Multimeter test leads</td>
<td>TL75 Hard Point test lead set (1 red, 1 black)</td>
</tr>
<tr>
<td>User manual</td>
<td>9 language versions on CD-ROM, “Getting Started” booklet included with instrument</td>
</tr>
</tbody>
</table>

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Fluke Corporation  ScopeMeter 190C/190B Series and ScopeMeter 120 Series
Oscilloscope Mode

Vertical deflection

<table>
<thead>
<tr>
<th>Bandwidth and Risetime</th>
<th>Fluke 124</th>
<th>Fluke 123</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bandwidth (risetime)</td>
<td>40 MHz</td>
<td>20 MHz</td>
</tr>
<tr>
<td>• with VPS40 probes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• input A and B directly</td>
<td>40 MHz</td>
<td>20 MHz</td>
</tr>
<tr>
<td>• with STL120 Shielded Test Leads</td>
<td>12.5 MHz</td>
<td>12.5 MHz</td>
</tr>
</tbody>
</table>

Instrument realtime (input directly) 8.75 ns 17.5 ns

Number of inputs: 2
Input coupling: AC, DC with ground level indicator
Input sensitivity: 5 mV to 500 V/div (with the included VPS40 (Fluke 124) and STL120 shielded test leads measure up to 600 Vrms, CAT III)
Input voltage: 600 V CAT III. See General Specifications for more detailed information
Vertical resolution: 8 bit
Accuracy: ± (2 % of reading + 0.05 x range/div)
Input impedance: 1 MΩ ± 1 % // 225 pF with STL120 shielded test leads; 1 MΩ ± 1 % // 20 pF ± 3 pF with BB120; 5 MΩ ± 1 % // 15.5 pF with VPS40, 10:1 Voltage probe

Horizontal

Max. sample rate (both channels simultaneously): Fluke 124: 2.5 GS/s for repetitive signals; 25 MS/s for single shot
Fluke 123: 1.25 GS/s for repetitive signals; 25 MS/s for single shot
Number of digitizers: 2
Time base range: 10 ns/div to 1 min/div (Fluke 124); 20 ns/div to 1 min/div (Fluke 123)
Maximum record length: 512 Min–Max points per input
Accuracy: ± (0.1 % of reading + 1 pixel)
Glitch detect: 40 ns

Display and acquisition

Display modes: Input A, input A and B, envelope, smooth
Acquisition modes: Normal (including glitch capture), single shot, roll

Trigger and delay

Source: Input A, input B, external via optional 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
Video triggering: NTSC, PAL, PAL+, SECAM. Includes line select
Time delay: Up to 10 divisions pre-trigger view

Measurements

Vdc, Vac, Vac+dc, Vpeak max, Vpeak min, Vpeak to peak, frequency (Hz), positive pulse width, negative pulse width, positive duty cycle, negative duty cycle, Amp ac, Amp dc, Amp ac+dc, Phase, Temperature °C, Temperature °F, dBV, dBm into 50 Ω and 600 Ω. (Amps, °C or °F with optional probes)

Cursor Measurements (124 only)

Sources: Input A, Input B
Modes: Single or dual vertical cursor, dual horizontal cursor, rise– or falltime
Measurements: Single vertical line: Average, min value, max value, time from start of recording in roll mode
Dual vertical lines: AV at markers, time between cursors, I/T between cursors (in Hz)
Dual horizontal lines: High, low or AV - readout, rise– and falltime: transition time, 0 %–level, 100 %–level, with markers at 10 % and 90 %
Accuracy: As oscilloscope

Dual Input Meter

The specified accuracy is valid over the temperature range 18 °C to 28 °C (64 °F to 82 °F). Add 10 % of specified accuracy for each °C below 18 °C or above 28 °C (64 °F to 82 °F)
Max. meter bandwidth: 40 MHz (Fluke 124), 20 MHz (Fluke 123)

Voltage measurements

Measurement selection: Vdc, Vac rms, Vac+dc rms, Vpeak max, Vpeak min, Vpeak
Ranges: 500 mV, 5 V, 50 V, 500 V, 1250 V
Full scale reading: 5,000 counts
Accuracy
Vdc: ± (0.5 % + 5 counts)
Vac rms:
1 Hz to 60 Hz: ± (2.5 % + 15 counts)
60 Hz to 1 kHz: ± (2.5 % + 15 counts)
20 kHz to 1 MHz ± (5 % + 20 counts)
Vac+dc true-rms:
DC to 60 Hz: ± (1 % + 10 counts)
60 Hz to 1 kHz: ± (2.5 % + 15 counts)
20 kHz to 1 MHz (5 % + 20 counts)
Vpeak:
Max peak or Min peak: 5% of full scale
Peak-to-peak: 10% of full scale

Ohms
Ranges: 500 Ω, 5 kΩ, 50 kΩ, 500 kΩ, 5 MΩ, 30 MΩ
Max. resolution: 5,000 counts
Accuracy: ± (0.6 % of reading + 5 counts)

Capacitance
Ranges: 50 nF to 500 µF
Max. resolution: 5,000 counts
Accuracy: ± (2 % of reading + 10 counts)

Other meter functions

Frequency: Up to 70 MHz (Fluke 124) or up to 40 MHz (Fluke 123)
Continuity: Beeper on < 30 Ω
Diode test: Up to 2.8 V
Amps: Amp dc, Amp ac, Amp ac+dc using an optional current clamp or shunt.
Scaling factors: 0.1 mV/Amp to 100 V/Amp
Temperature (°C, °F): With optional accessories. Scale factors 1 mV/°C or 1 mV/°F
Number of inputs: 2
Input impedance: 1 MΩ ± 1 % // 10 pF ± 2 pF
Advanced meter functions: Auto/manual ranging, TouchHold©, Relative measurements (zero reference), TrendPlot recording
Mechanical data
Size: 50 x 115 x 232 mm (2 x 4.5 x 9.1 in)
Weight: 1.2 kg (2.64 lbs)

Safety
Compliance: EN61010.1 (1993) Pollution degree 2,
UL3111-1 (1994), CAN/CSA-C22.2 No. 1010.1 (1992),
ANSI/ISA S82.01 (1994)

Input voltage ratings
Maximum input voltage: 600 V CAT III
(Maximum voltage between input and reference lead)
Maximum input voltage using VPS40 Probe: 600 V
CAT III, 1000 V CAT II
(Maximum voltage between probe tip input and reference lead)
Floating voltage: 600 V 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 self recovering fault protection. For different ground potential measurements between inputs use DP120 differential voltage probe

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: 2,000 m (6,500 feet);
3,000 m (10,000 feet) voltages ≤ 400 V
Maximum storage altitude: 12 km (40,000 feet)
Electro-Magnetic Compatibility:
Emission EN50081-1 (EN55022 and EN60555-2)
Immunity EN50082-2 (IEC1000–4-2, -3, -4, -5)

Optically isolated PC/Printer interface
To printer: Supports HP Laserjet,® Deskjet,® Epson
FX/LQ and postscript printers via optional PAC91
To PC: Transfer instrument settings, screen images and data, compatible with FlukeView® software for Windows® via optional PM9080

Warranty
3 years, parts and labor on mainframe instrument
1 year on accessories

Recorder Mode
Trendplot recording
Dual input electronic paperless chart recorder. Plots and displays the actual, minimum, maximum and average of any measurement.
Source and display: Input A, Input A and B
Range: 15 s/div to 2 days per division (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
Drip and dust proof: IP51 according to IEC529
Shock and vibration: Shock 30 g Vibration 3 g (sinusoidal) according to MIL-PRF-28800F Class 2

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

Memory Save and Recall
20 (10 in Fluke 123) instrument screens with user set-ups and user text

Real-time clock
Time and date stamp TrendPlot recording

Power
Line power: Country specific line voltage adapter/battery charger included
Battery power: Rechargeable Ni-MH BP130 (installed in Fluke 124) or rechargeable NiCd BP120 (installed in Fluke 123)
Battery operating time: Up to 7 hours using BP130, up to 5 hours using BP120
Battery charging time: 5 hours (Fluke 123), 7 hours (Fluke 124)
Battery power saving functions: Auto power down with adjustable power down time. On-screen battery power indicator

Standard Accessories
- Rechargeable battery pack (installed)
- Line voltage adapter / Battery charger
- Voltage probes and accessories
- Multimeter test leads
- User manual

Fluke 123, Fluke 124
- BP120 (Fluke 123), BP130 (Fluke 124)
- STL120 Shielded Test lead set; VPS40 high impedance 10:1 probe, 40 MHz (1 black, included with Fluke 124 only);
- HC120 hook clips; ground leads with mini alligator clips; AC120 alligator clips; BB120 BNC-to-Shielded banana adapter
- TL7S Hard Point test lead (1 black)
- 14 language versions on CD-ROM, "Getting Started" booklet included with instrument

Accessories

Recorder Mode
Trendplot recording
Dual input electronic paperless chart recorder. Plots and displays the actual, minimum, maximum and average of any measurement.
Source and display: Input A, Input A and B
Range: 15 s/div to 2 days per division (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
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Case
Design: Rugged, shock proof with integrated protective holster
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Display
Bright LCD with CCFL backlight, 60 (35) cd/m2 with (without) power adapter
Size: 72 x 72 mm (2.8 x 2.8 inch)
Resolution: 240 x 240 pixels
Contrast and brightness: User adjustable, temperature compensated

Memory Save and Recall
20 (10 in Fluke 123) instrument screens with user set-ups and user text

Real-time clock
Time and date stamp TrendPlot recording

Power
Line power: Country specific line voltage adapter/battery charger included
Battery power: Rechargeable Ni-MH BP130 (installed in Fluke 124) or rechargeable NiCd BP120 (installed in Fluke 123)
Battery operating time: Up to 7 hours using BP130, up to 5 hours using BP120
Battery charging time: 5 hours (Fluke 123), 7 hours (Fluke 124)
Battery power saving functions: Auto power down with adjustable power down time. On-screen battery power indicator

Standard Accessories
- Rechargeable battery pack (installed)
- Line voltage adapter / Battery charger
- Voltage probes and accessories
- Multimeter test leads
- User manual

Fluke 123, Fluke 124
- BP120 (Fluke 123), BP130 (Fluke 124)
- STL120 Shielded Test lead set; VPS40 high impedance 10:1 probe, 40 MHz (1 black, included with Fluke 124 only);
- HC120 hook clips; ground leads with mini alligator clips; AC120 alligator clips; BB120 BNC-to-Shielded banana adapter
- TL7S Hard Point test lead (1 black)
- 14 language versions on CD-ROM, "Getting Started" booklet included with instrument

Accessories
**International Safety Standards**

<table>
<thead>
<tr>
<th>Overvoltage Category</th>
<th>Summary description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAT IV</td>
<td>Three phase at utility connection, any outdoors conductors (under 1,000 V)</td>
</tr>
<tr>
<td></td>
<td>- Outside and service entrance</td>
</tr>
<tr>
<td></td>
<td>- Service drop from pole to building</td>
</tr>
<tr>
<td></td>
<td>- Run between meter and panel</td>
</tr>
<tr>
<td></td>
<td>- Overhead line to detached building</td>
</tr>
<tr>
<td></td>
<td>- Underground line to well pump</td>
</tr>
<tr>
<td>CAT III</td>
<td>Three-phase distribution (under 1,000 V), including single phase commercial lighting and distribution panels</td>
</tr>
<tr>
<td></td>
<td>- Feeders and short branch circuits</td>
</tr>
<tr>
<td></td>
<td>- Distribution panel devices</td>
</tr>
<tr>
<td></td>
<td>- Heavy appliance outlets with “short” connections to service entrance</td>
</tr>
<tr>
<td>CAT II</td>
<td>Single-phase receptacle connected loads</td>
</tr>
<tr>
<td></td>
<td>- Outlets and long branch circuits</td>
</tr>
<tr>
<td></td>
<td>- All outlets at more than 10 m (30 ft) from Category III source</td>
</tr>
<tr>
<td></td>
<td>- All outlets at more than 20 m (60 ft) from Category IV source</td>
</tr>
<tr>
<td>CAT I</td>
<td>Electronic</td>
</tr>
<tr>
<td></td>
<td>- Electronic equipment</td>
</tr>
<tr>
<td></td>
<td>- Low energy equipment with transient limiting protection</td>
</tr>
</tbody>
</table>

To protect your instrument and – more importantly – yourself, choose a test tool that can withstand the electrical hazards present in the environment in which you plan to use it.

EN61010 establishes international safety requirements for electrical measurement equipment. It separates the various electrical environments into installation categories based on the danger from high voltage–energy transients. To choose the right tool, the voltage rating alone does not determine the safety. It is the combination of voltage rating and installation category that determines maximum transient withstand capability of the tool. CAT III rated instruments are recommended for measurement on industrial power distribution systems.

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**FlukeView® ScopeMeter® Software for Windows®**

FlukeView software adds PC power to your Fluke ScopeMeter Test Tools.

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) or in black and white (Fluke 190B and 120 Series)
- Copy color screen images into your reports and documentation (color screen images with Fluke 190C Series only)
- Capture and store waveform data from your ScopeMeter on your PC
- Create and archive waveform references for automatic (Fluke 190C Series) or visual (Fluke 190B and 190C Series) comparison
- Use cursors for parameter measurement
- Includes waveform analysis, e.g., FFT spectrum analysis
- Copy waveform data into your spreadsheet for detailed analysis
- 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, eg., 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

*Note: Some functionality may be available with specific ScopeMeter models only*

**System requirements**
- Pentium 90 or better
- CD-ROM drive
- Windows® 95 / 98 / Me / NT 4.0 / 2000 / XP
- One free RS 232 port
- PM9080 Optically isolated RS 232 adapter/cable, available separately or included in SCC190/SCC120 kit and in ScopeMeter “S” versions

**Supported Instruments**
Full support for Fluke 199C, 199B, 199, 196C, 196B, 196, 192B, 192, 124, 123
### Selection Guide

<table>
<thead>
<tr>
<th>190C Color ScopeMeter Series</th>
<th>190B ScopeMeter Series</th>
<th>Fluke 120 Series</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fluke 199C</strong></td>
<td><strong>Fluke 196C</strong></td>
<td><strong>Fluke 124</strong></td>
</tr>
<tr>
<td><strong>Fluke 199B</strong></td>
<td><strong>Fluke 196B</strong></td>
<td><strong>Fluke 123</strong></td>
</tr>
<tr>
<td><strong>Fluke 192B</strong></td>
<td><strong>Fluke 192B/S</strong></td>
<td><strong>Fluke 120</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bandwidth</th>
<th>200 MHz / 2.5 GS/s</th>
<th>100 MHz / 1 GS/s</th>
<th>40 MHz / 2.0 MHz</th>
<th>200 MHz / 2.5 GS/s</th>
<th>100 MHz / 1 GS/s</th>
<th>60 MHz / 2.0 MHz</th>
<th>40 MHz / 2.0 MHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max real time sample rate</td>
<td>2.5 GS/s</td>
<td>1 GS/s</td>
<td>2.5 GS/s</td>
<td>1 GS/s</td>
<td>500 MS/s</td>
<td>25 MS/s</td>
<td></td>
</tr>
<tr>
<td>Max equivalent time sample rate</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>2.5 GS/s</td>
<td>1.25 GS/s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Display</td>
<td>144 mm full color LCD</td>
<td>144 mm monochrome LCD</td>
<td>102 mm monochrome LCD</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital persistence</td>
<td>Yes, gives analog oscilloscope like waveform decay (user selectable)</td>
<td>–</td>
<td>–</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Envelope mode</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max record length</td>
<td>1200 points per input channel</td>
<td>27,500 points per input or more (5 ms/div to 2 min/div)</td>
<td>S12 min/max points per input</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of inputs</td>
<td>2 plus external / DMM input, all isolated from each other and from ground</td>
<td>–</td>
<td>–</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of digitizers</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Independently floating isolated inputs</td>
<td>Up to 1000 V between inputs, references and ground</td>
<td>–</td>
<td>–</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glitch capture</td>
<td>2 mV/div to 100 V/div</td>
<td>5 mV/div. to 100 V/div</td>
<td>5 mV/div to 500 V/div</td>
<td></td>
<td></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 to 2 min/div</td>
<td>10 ns/div to 1 min/div</td>
<td>20 ns/div to 1 min/div</td>
<td></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, Selectable Pulse Width and External</td>
<td>Connect-and-View™, Free Run, Single Shot, Edge, Video</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scope measurements</td>
<td>7 cursor measurements, 30 automatic measurements</td>
<td>cursors + 20 automatic measurements</td>
<td>20 automatic measurements</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waveform mathematics</td>
<td>A + B, A - B, A x B, A versus B (X-Y-mode, giving Lissajous diagrams)</td>
<td>–</td>
<td>–</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ScopeMeter trigger modes</td>
<td>Start on trigger, stop on trigger</td>
<td>–</td>
<td>–</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capture last 100 screens</td>
<td>Automatic, with replay capability</td>
<td>–</td>
<td>–</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dual input TrendPict</td>
<td>Yes, with cursors and zoom</td>
<td>Yes</td>
<td>–</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Memory for screens and set-ups</td>
<td>10 screens with set-up; 5 more memories are made available upon registration of the ScopeMeter</td>
<td>20</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Memory for recordings</td>
<td>Two, each can store 100 scope screens, a ScopeRecord or a TrendPlot</td>
<td>–</td>
<td>–</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>True-rms multimeter</td>
<td>5000 counts, Volts, Amps, Ohms, Continuity, Diode, Temp</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety certified (EN61010-1)</td>
<td>1000 V CAT II / 600 V CAT III (instrument and included accessories)</td>
<td>800 V CAT III (instrument and included accessories)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Battery (installed)</td>
<td>4 hr Ni-MH BP190</td>
<td>7 hr NiMH</td>
<td>5 hr NiCd</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Line Power</td>
<td>Adapter / battery-charger included</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size</td>
<td>25 x 16.9 x 6.4 cm (10.1 x 6.7 x 2.5 in)</td>
<td>232 x 115 x 50 mm (9.2 x 4.5 x 2 in)</td>
<td>8.4 x 3.8 x 2.4 in</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>2 kg (4.4 lb)</td>
<td>1.2 kg (2.64 lbs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PC and Printer Interface</td>
<td>Using optional optically isolated RS-232 adapter/cable</td>
<td></td>
<td></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>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Detailed technical specifications and optional accessories can be found on the Fluke web site. There, you can also download a fully-functional instrument which is based on the real instrument firmware. Check it out at: [www.fluke.com/scopemeter](http://www.fluke.com/scopemeter).

### Ordering Information

<table>
<thead>
<tr>
<th>Fluke-199C/S</th>
<th>Color ScopeMeter (200 MHz / 2.5 GS/s) with SCC190 kit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluke-199C</td>
<td>Color ScopeMeter (200 MHz / 2.5 GS/s) with SCC190 kit</td>
</tr>
<tr>
<td>Fluke-196C/S</td>
<td>Color ScopeMeter (100 MHz / 1 GS/s) with SCC190 kit</td>
</tr>
<tr>
<td>Fluke-196C</td>
<td>Color ScopeMeter (100 MHz / 1 GS/s) with SCC190 kit</td>
</tr>
<tr>
<td>Fluke-199B/S</td>
<td>ScopeMeter (200 MHz / 2.5 GS/s) with SCC190 kit</td>
</tr>
<tr>
<td>Fluke-199B</td>
<td>ScopeMeter (200 MHz / 2.5 GS/s) with SCC190 kit</td>
</tr>
<tr>
<td>Fluke-198B</td>
<td>ScopeMeter (100 MHz / 1 GS/s) with SCC190 kit</td>
</tr>
<tr>
<td>Fluke-198B</td>
<td>ScopeMeter (100 MHz / 1 GS/s) with SCC190 kit</td>
</tr>
<tr>
<td>Fluke-198B</td>
<td>ScopeMeter (100 MHz / 1 GS/s) with SCC190 kit</td>
</tr>
<tr>
<td>Fluke-192B</td>
<td>ScopeMeter (60 MHz / 500 MS/s) with SCC120 kit</td>
</tr>
<tr>
<td>Fluke-124/S</td>
<td>Industrial ScopeMeter, 40 MHz, with SCC120 kit</td>
</tr>
<tr>
<td>Fluke-124</td>
<td>Industrial ScopeMeter, 20 MHz, with SCC120 kit</td>
</tr>
<tr>
<td>Fluke-123/S</td>
<td>Industrial ScopeMeter, 20 MHz, with SCC120 kit</td>
</tr>
<tr>
<td>Fluke-123</td>
<td>Industrial ScopeMeter, 20 MHz, with SCC120 kit</td>
</tr>
<tr>
<td>BP120</td>
<td>Rechargeable Nicd Battery for use with Fluke 120 Series</td>
</tr>
<tr>
<td>BP130</td>
<td>Rechargeable NiMH Battery for use with Fluke 120 Series</td>
</tr>
<tr>
<td>BP190</td>
<td>Rechargeable NiMH Battery for use with Fluke 190 Series ScopeMeters</td>
</tr>
<tr>
<td>SW90W</td>
<td>FlukeView ScopeMeter Software for Windows</td>
</tr>
<tr>
<td>PM9080</td>
<td>Optically isolated RS232 adapter/cable</td>
</tr>
<tr>
<td>SC190</td>
<td>Software - Cable - Case kit for Fluke 190 Series</td>
</tr>
<tr>
<td>SC120</td>
<td>Software - Cable - Case kit for Fluke 120 Series</td>
</tr>
<tr>
<td>C195</td>
<td>Durable, universal soft carrying case for ScopeMeters and accessories</td>
</tr>
<tr>
<td>C190</td>
<td>Hard shell protective carrying case for Fluke 190 Series ScopeMeters</td>
</tr>
<tr>
<td>C125</td>
<td>Durable, protective soft carrying case for Fluke 120 Series ScopeMeters</td>
</tr>
<tr>
<td>C120</td>
<td>Hard shell protective carrying case for Fluke 120 Series ScopeMeters</td>
</tr>
<tr>
<td>DP120</td>
<td>Differential Voltage Probe for use with Fluke 120 Series</td>
</tr>
<tr>
<td>VS40</td>
<td>40 MHz, 10:1 Voltage probe set for use with Fluke 120 Series</td>
</tr>
</tbody>
</table>

**Fluke Corporation**
PO Box 9090, Everett, WA USA 98206

**Fluke Europe B.V.**
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In Canada (800)-36-FLUKE or Fax (905) 890-6866

From other countries (425) 446-5500 or Fax (425) 446-5116

Web access: [http://www.fluke.com/](http://www.fluke.com/)

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