NEW: Fluke 215C and 225C

FLUKE®

ScopeMeter® 190 Series incl. 225C and 215C and ScopeMeter® 120 Series Technical Data

Connect and View

NEW: Fluke 215C and 225C

ScopeMeter 190C Series: Speed, performance and analysis power

For demanding applications, the ScopeMeter 190C 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
- ☑ Bus Health Test capability for industrial buses (225C and 215C)
- ☑ High waveform resolution of 3000 datapoints per channel
- ☑ Digital Persistence for analyzing complex dynamic waveforms like on an analog scope
- ☑ 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
- ☑ 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
- ☑ 5000 count DMM and paperless recorder built-in

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 Series incl. 225C and 215C

OSCILLOSCOPE MODE

VERTICAL DEFLECTION

	Fluke 225C Fluke 199C	Fluke 215C, Fluke 196C	Fluke 192C
Bandwidth	200 MHz	100 MHz	60 MHz
Rise time	1.7 ns	3.5 ns	5.8 ns

Bandwidth limiter	User selectable: 10 kHz, 20 MHz or off
Number of inputs	2 inputs plus external trigger. All inputs isolated from each other and from ground.
Input coupling	AC or DC, with ground level indicator
Input sensitivity	2 mV/div to 100 V/div
Normal/Invert	On both input channels; switched separately
Variable Attenuator	Variable Gain on input channel A
Input voltage	1000V CAT II, 600 V CAT III rated – See 'general specifications' for further details.
Vertical resolution	8 bit
Accuracy	± (1.5% of reading + 0.04 x range/div)
Input impedance	1 MΩ ± 1% // 15 pF ± 2 pF

HORIZONTAL

	Fluke 225C Fluke 199C	Fluke 215C Fluke 196C	Fluke 192C
Maximum real-time sample rate	2.5 GS/s	1 GS/s	500 MS/s
Number of digitizers	2	2	2
Time base range	5 ns/div to 5 s/div		10 ns/div to 5 s/div

Maximum record length	3000 points per input in Scope-mode; 27,500 points per input in ScopeRecord™ roll mode (5 ms/div … 2 min/div)
Accuracy	± (0.01% of reading + 1 pixel)
Glitch capture	50 nsec (5 µsec/div to 1 min/div)

DISPLAY AND ACQUISITION

Display	144 mm Full-Color LCD, with backlight
Display Modes	Input A, Input B, dual, average, Replay
Visible screen width	12 divisions in scope mode
Persistence modes:	Digital persistence short / medium / long / infinite
Waveform Mathematics	A+B, A–B, A*B, all with user selectable scaling of resultant; A versus B (X-Y-mode); Frequency Spectrum using FFT analysis.
Acquisition modes	Normal, auto, single shot, ScopeRecord™, roll, glitch capture, waveform compare with automatic "Pass / Fail testing". Bus Health test mode (225C and 215C only), Eyepattern Display of single ended or differential bus signal (Fluke 225C and 215C only).

TRIGGER AND DELAY

Source	Input A, input B, external trigger input. All input references isolated from each other and from ground.
Modes	Automatic Connect-and-View™, free run, single shot, edge, delay, video, video line, selectable pulsewidth, dual slope, 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 so desired.
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, ≠t, where t is selectable in minimal steps of 0.01 div or 50 nsec.
Time delay	1 full screen of pre-trigger view or up to 100 screens (=1200 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

	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 capturing 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

	Shows frequency content of oscilloscope waveform using Fast Fourier Transform
Window	Automatic, Hamming, Henning or None
Automatic Window	Digitally 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

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 ScopeMeter or externally using FlukeView Software.
Pass/Fail Testing	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, dBV, dBm into 50Ω and 600Ω V_{PWM} ac, V_{PWM} ac+dc for measurement on pulsewidth modulated motordrives 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, 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 FFT Result.

ZOOM

Up to 16x horizontal zoom

BUS HEALTH TEST MODE (Fluke 225C and 215C only)

Bus Health automatically analyzes the electrical signals on the industrial bus system to measure individual parameters and to give waveform information. Automatically compares the measurement results to preset values and present 'good,'weak' or 'false' indicator with each parameter.

Bus types and reference standards used:

AS-i (EN50295, 166 kb/s);
CAN-bus (ISO-11898, up to 1 Mb/s);
Modbus (EIA-232 up to 115 kb/s and EIA-485 up to 10 Mb/s);
Foundation Fieldbus H1 (61158 type 1, 31.25 kb/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;
Ethernet 100BaseT (100 Mb/s);
RS-232 (EIA-232, up to 115 kb/s);
RS-485 (EIA-485, up to 10 Mb/s).

Measured parameters (where applicable):

Bias voltage level, signal amplitude, pulse width or baud rate, risetime, fall time, jitter, signal distortion, noise HF, noise LF, in-band noise.

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	500mV, 5V, 50V, 500V, 1,000V
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	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	A_{dc}, A_{ac}, A_{ac+dc} using an optional current clamp or shunt. Scaling factors: 0.1 mV/A, 1 mV/A, ... 100 V/A and 400 mV/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

RECORDER MODE

SCOPE-RECORD-ROLL MODE	Dual input waveform storage 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	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 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 (overview of total record)	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 or 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 (VPS210) and reference lead)*
Floating voltage	1,000V CAT II, 600V CAT III *(Maximum voltage between earth ground and any terminal (signal input or shielding))*
Independently isolated inputs	1,000V CAT II, 600V CAT III *(Maximum voltage between any terminal of one input or probe (VPS210) and any other terminal of another input or probe (VPS210))*
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	15 memory locations that each can contain two waveforms plus corresponding setup. With each storage action, a user specified name (20 ASCII-characters long) can be assigned to the stored data, for easier reference.
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); 144 mm (5.67 inch) diagonal
Resolution	320 x 240 pixels
Contrast and brightness	User adjustable, temperature compensated
Brightness	80 cd/m^2 typ. using power adapter

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; UL61010B, 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.

Technical Specifications ScopeMeter 120 Series

OSCILLOSCOPE MODE

VERTICAL DEFLECTION

Bandwidth and risetime	Fluke 125, 124	Fluke 123
• with VPS40 probes	40 MHz	20 MHz
• input A and B directly	40 MHz	20 MHz
• with STL120 Shielded Test Leads	12.5 MHz	12.5 MHz
Instrument risetime (input directly)	8.75 ns	17.5 ns

Number of inputs	2
Input coupling	AC, DC with ground level indicator
Input sensitivity	5 mV ... 500 V/div (with included VPS40 (Fluke 125, 124) and STL120 shielded test leads measure up to 600Vrms CAT III)
Vertical resolution	8 bit
Accuracy	± (1% 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

Maximum sample rate	Fluke 125 and 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 125, 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, single shot, roll, glitch capture (always on)

TRIGGER AND DELAY

Connect-and-View

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

V_{DC}, V_{AC}, V_{AC+DC}, $V_{peak\ max}$, $V_{peak\ min}$, $V_{peak\ to\ peak}$, 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 50Ω and 600Ω. (Amps, °C or °F with optional probes)

CURSOR MEASUREMENTS (Fluke-124 and -125 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	ΔV at markers, time between cursors, 1/T between cursors (in Hz)
Dual horizontal lines	High, low or ΔV-readout, rise- and falltime: transition time, 0 %-level, 100 %-level, with markers at 10 % and 90 %
Accuracy	As oscilloscope

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 the 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-232 up to 115 kb/s and EIA-485 up to 10 Mb/s); Foundation Fieldbus H1 (61158 type 1, 31.25 kb/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); or user defined system.
Measured parameters (where applicable):	Baud rate, risetime, falltime, high level, low level, distortion, amplitude and jitter, with comparison to system's standard values.

POWER MEASUREMENTS (Fluke 125 only)

Measure Types	Watt, VA, VAR, Power Factor (PF)
Power Configuration	Single phase or Balanced 3-phase (delta-configuration) mains supply
Voltage Measurement:	Channel A, using STL120, voltage probe or direct input
Current Measurement:	Channel B, using i400s current clamp (included) or other compatible clamp
Current Clamp or shunt sensitivity:	0.1 / 1 / 10 / 100 / 1000 mV/A, 10 mV/mA and 400 mV/A.

HARMONICS MODE (Fluke 125 only)

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

Analyzed waveform:	Voltage waveform (Ch.A), Current waveform (Ch.B) or Power (Ch.A x Ch.B), automatically generated.
Harmonics Frequency range:	DC…33rd harmonic (fundamental ≤ 60 Hz); DC…24th (fundamental ≤ 400 Hz).
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 %r or %f

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) and 20 MHz (for Fluke 123)

V_{DC}

Ranges	500mV, 5V, 50V, 500V, 1,250V
Max. Resolution	5,000 counts
Accuracy	± (0.5% + 5 counts)

$V_{AC\ RMS}$

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)

$V_{AC\ PWM}$

Measures the effective output voltage of pulse-width modulated motor drives and frequency inverters (Fluke 125 only)

$V_{AC+DC\ TRUE\ RMS}$

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)

$A_{AC+DC\ TRUE\ RMS}$, A_{AC}, A_{DC}

Current Clamp or shunt sensitivity:	0.1 mV/A, 1 mV/A, 10 mV/A, 100 mV/A, 400 mV/A, 1 V/A or 10 mV/mA.

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, 4 or 8 pulses per 2 revolutions (Fluke 125 only)
Max. RPM reading	50 kRPM
Continuity	Beeper on < 30Ω
Diode test	Up to 2.8V
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	1MΩ ± 1% // 10 pF ± 2 pF
Advanced meter functions	Auto/manual ranging TouchHold® Relative measurements (zero reference) TrendPlot recording

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 till 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 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 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 adapter/battery charger included
Battery power	Rechargeable Ni-MH BP120MH (installed)
Battery operating time	Up to 7 hours using BP120MH
Battery charging time	7 hours
Battery power saving functions	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; CAN/CSA C22.2 No. 61010-1-04 and UL No. 61010-1-2004, including $_{C}CSA_{US}$-approval; ANSI/ISA-82.02.01.

INPUT VOLTAGE RATINGS

Maximum input voltage	600V 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	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 applications that have different reference potential on inputs, use DP120 differential voltage probe or a Fluke 190C-Series instrument.

ENVIRONMENTAL

According MIL-PRF-28800F, Class 2	
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	2,000m (6,500 feet) 4,500m (15,000 feet) voltages ≤300V
Maximum storage altitude	12 km (40,000 feet)
Electro-Magnetic-Compatibility (EMC)	EN61326-1 for emissions and immunity

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 OC4USB (USB) or PM9080 (RS-232) interface cable.
WARRANTY	3 years (parts and labor) on main instrument, 1 year on accessories

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
- 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
- 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, 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 (Fluke 190C Series)
- English, French and German versions included on a single CD-ROM

System requirements
- Pentium 90 or better
- CD-ROM drive
- Microsoft® Windows® (2000 and beyond)
- 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, 125, 124 and 123. Starting release V4.5, the Fluke 225C, 215C and 192C are supported.

Accessories

Standard Accessories	Fluke 225C, 215C, 199C, 196C, 192C	Fluke 125, 124, 123
Rechargeable battery pack (installed)	BP190	BP120MH
Line voltage adapter / Battery charger	BC190	PM8907
Voltage probes (1 set red, 1 set grey) and accessories Multimeter testleads	10:1 voltage probe (VPS210) including hook clip, ground lead with hook clip, ground lead with mini alligator clip, 4 mm add-on probe tip, ground spring for probe tip TL75 Hard Point testlead set (1 red, 1 black)	STL120 Shielded Test lead set, VPS40 high impedance 10:1 probe, 40 MHz (1 black, included with Fluke 125 & 124); HC120 hook clips; ground leads with mini alligator clips, AC120 alligator clips; BB120 BNC-to-Shielded-banana adapter TL75 Hard Point test lead (1 black)
Current Clamp	--	i400s current clamp (included with Fluke125 only)
User manual	multi-lingual CD-ROM, "Getting Started" booklet included with instrument	multi-lingual CD-ROM. "Getting Started" booklet included with instrument
Bus Test Connection support	BHT190 included with Fluke 225C and 215C, acts as break-out adaptor for DB-9, RJ-45 and M12 industrial bus connection systems	BHT190 optional, for use with Fluke 125 only

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.

FLUKE®

Selection Table

	Color ScopeMeters With Bus Health Test		Color ScopeMeter 190C Series			ScopeMeter 120 Series		
	Fluke 225C	**Fluke 215C**	**Fluke 199C**	**Fluke 196C**	**Fluke192C**	**Fluke 125**	**Fluke 124**	**Fluke 123**
Bandwidth	200 MHz	100 MHz	200 MHz	100 MHz	60 MHz	40 MHz	40 MHz	20 MHz
Max. real time sample rate	2.5 GS/s	1 GS/s	2.5 GS/s	1 GS/s	500 MS/s	25 MS/s		
Max. Equivalent time sample rate	--					2.5 GS/s	2.5 GS/s	1.25 GS/s
Display	14.4 cm Full Color LCD					10.2 cm Monochrome LCD		
Digital Persistance	Yes, gives analog oscilloscope like waveform decay (user selectable)					--		
Envelope mode	Yes					Yes		
Waveform Compare	Visual Reference and Automatic 'Pass / Fail' testing					--		
Max. Record length ... In Scope mode: ... In ScopeRecord mode:	3000 points per input channel, allowing for high time resolution signal analysis using Zoom 27,500 points per input or more (5 ms/div...2 min/div.)					512 min/max points per input		
Number of inputs	2 plus external / DMM input, all isolated from each other and from ground					2; opt. Isolated External Trig. thru ITP120		
Number of digitizers	2					2		
Independently floating isolated inputs	Up to 1000 V between inputs, references and ground					--		
Input sensitivity	2 mV/div. ...100 V/div.					5 mV/div. 500 V/div.		
Glitch capture	Up to 3 ns using Pulse Width triggering; 50 ns peak detect at 5 µs/div. to 1 min/div.					40 ns		
Timebase range in Scope mode	5 ns/div. to 2 min/div.				10 ns/div. ... 2 min/div.	10 ns/div. ...1 min/div.		20 ns/div. ... 1 min/div
Trigger types	Connect-and-View™, Free Run, Single Shot, Edge, Delay, Video Frame, Video Line, Selectable pulse width and External. Dual slope trigger and Event trigger (n-cycle)					Connect-and-View™, Free Run, Single Shot, Edge, Video		
Scope Measurements	7 cursor measurements, 30 automatic measurements Automatic Vrms and watts measurement on cursor limited part of waveform					As 124 + Power, VA, VAR, PF, RPM, Vpwm; THD	Cursor + 26 Automatic measurement	26 automatic measurements
Bus Health Test function	Signal validation and eyepattern mode for standard industry buses		--			For standard industry buses	--	
Waveform Mathematics	A + B, A - B, A x B, A versus B (X-Y-mode, giving Lissajous diagrams) Frequency Spectrum (FFT)					Harmonics mode	--	
Power Measurements	P (W), VA, VAR, PF					Power, VA, VAR, PF, Vpwm	--	
Scope-Record Trigger modes	Start on Trigger, Stop on Trigger					--		
Capture last 100 screens	Automatic, with Replay capability					--		
Dual input TrendPlot	Yes, with Cursors and Zoom					Yes, with cursors		Yes
Memory for screens/set-ups	10 screens and set-ups; 5 more memories are made available upon registration of the ScopeMeter					20		10
Memory for recordings	Two, each can store 100 scope screens, a ScopeRecord or a TrendPlot							
True RMS multimeter	5000 counts, Volts, Amps, Ohms, Continuity, Diode, Temp					Dual fully featured 5000 counts DMM		
Safety certified (EN61010-1)	1000 V CAT II / 600 V CAT III (instrument and included accessories)					600 V CAT III (Instrument and included accessories)		
Battery (installed)	4 hr Ni-MH (BP190)					7 hr Ni-MH (BP120MH)		
BHT190 Bus Health adapterset	Included		--			optional	--	
Line power	Adapter / battery-charger included (BC190)					Adapter / Battery charger included (PM8907)		
Size (cm)	25.6 x 16.9 x 6.4 cm					23.2 x 11.5 x 5.0 cm		
Weight	2 kg					1.2 kg		
PC and Printer interface	Using optional Optically Insulated adapter / cable OC4USB (USB) or PM9080 (RS-232)							
Warranty	3 years on main instrument, 1 year on the standard accessories							

Ordering Information

Fluke 225C	Color ScopeMeter (200 MHz / 2.5 GS/s) with Bus Health Test Functions
Fluke 225C/S	Color ScopeMeter (200 MHz / 2.5 GS/s) with Bus Health Test + SCC190
Fluke 215C	Color ScopeMeter (100 MHz / 1 GS/s) with Bus Health Test Functions
Fluke 215C/S	Color ScopeMeter (100 MHz / 1 GS/s) with Bus Health Test + SCC190 kit
Fluke 199C	Color ScopeMeter (200 MHz / 2.5 GS/s)
Fluke 199C/S	Color ScopeMeter (200 MHz / 2.5 GS/s) + SCC190
Fluke 196C	Color ScopeMeter (100 MHz / 1 GS/s)
Fluke 196C/S	Color ScopeMeter (100 MHz / 1GS/s) + SCC190
Fluke 192C	Color ScopeMeter (60 MHz / 500 MS/s)
Fluke 192C/S	Color ScopeMeter (60 MHz / 500 MS/s) + SCC190 kit
Fluke 125	Industrial ScopeMeter (40 MHz)
Fluke 125/S	Industrial ScopeMeter (40 MHz) + SCC120 kit
Fluke 124	Industrial ScopeMeter (40 MHz)
Fluke 124/S	Industrial ScopeMeter (40 MHz) + SCC120 kit
Fluke 123	Industrial ScopeMeter (20 MHz)
Fluke 123/S	Industrial ScopeMeter (20 MHz) + SCC120 kit
SCC190	FlukeView® Software + Cable + Case (190 Series)
SCC120	FlukeView® Software + Cable + Case (120 Series)
PM9080	Optically Isolated RS-232 adapter/cable
OC4USB	Optically Isolated USB interface cable
DP120	Differential Voltage Probe for Fluke 120 Series
BHT190	Bus Health Test break-out adapter for DB-9, RJ-45 and M12 connection systems
ITP120	Optically Isolated External Trigger Input for Fluke 120 series
SW90W	FlukeView® ScopeMeter Software for Windows®
C190	Hard Shell Carrying Case for Fluke 190 series
C120	Hard Shell Carrying Case for Fluke 120 series

• SCC kit includes: Hard-shell carrying case, optically isolated USB interface cable, and FlukeView® for Windows® software.

Fluke Corporation
P.O. Box 9090
Everett, WA USA 98206

Fluke Europe B.V.
P.O. Box 1186
5602 BD Eindhoven
The Netherlands

For more information call:
In the U.S.A. (800) 443-5853
or Fax (425) 446 -5116
In Europe/M-East/Africa +31 (0)40 2 675 200
or Fax +31 (0)40 2 675 222
In Canada (905) 890-7600
or Fax (905) 890-6866
From other countries +1 (425) 446 -5500
or Fax +1 (425) 446 -5116

Visit us on the world wide web at:

http://www.fluke.com

Fluke (UK) Ltd.
52 Hurricane Way
Norwich
Norfolk
NR6 6JB
United Kingdom
Tel.: 0207 942 0700
Fax: 0207 942 0701
E-mail: industrial@uk.fluke.nl

Visit us on the world wide web at:

http://www.fluke.co.uk

Pub_ID: 11203-eng
Rev. 02