ScopeMeter® Test Tools

ScopeMeter portable oscilloscopes take you into territory standard bench scopes can't go: where it's harsh, hazardous and dirty – without sacrificing any capabilities. They provide you with unmatched speed, performance and analysis power while working on site.

ScopeMeter 190 Series II

New

The toughest portable scopes ever built

Combining rugged portability with the performance of a bench scope, the Fluke 190 Series can take you from troubleshooting microelectronics all the way into power electronic applications. See more, fix more and go where you've never gone with a scope before.

The first high-performance two and four Channel scopes built for harsh industrial environments.

Introducing the first high-performance portable oscilloscopes with 2 or 4 independently insulated input channels, an IP51 dust- and drip waterproof rating and a CAT III 1000 V / CAT IV 600 V safety rating. Choose from 500 MHz, 200 MHz, 100 MHz or 60 MHz bandwidth models.

Now plant maintenance engineers can take a four-channel scope into the harsh world of industrial electronics. Safely troubleshoot three-phase systems like variable speed drives, UPS or back-up generators. Measure input, output and feedback signals simultaneously to diagnose industrial electronics.

- 4 independent isolated input channels enable 3-axis industrial testing, simultaneous testing of input signals, output signals and feedback loops or safety interlocks
- 190-XX4 model with four independent isolated inputs
- 190-XX2 models with two independenet isolated scope inputs and DMM input
- Fast sample rate: up to 5 GS/s with up to 200 ps resolution
- Single shot, pulse width and video triggering
- Deep memory: 10,000 points per trace waveform capture
- CAT III 1000 V / CAT IV 600 V, safety rated
- Up to seven hours of operation with high performance Li-ion batteries, that extend usage time plus optional external charger
- Battery door for conveniently swapping out
- Two isolated USB ports, for memory devices and PC connectivity
- Security slot to lock down instrument using standard Kensington® lock
- Connect & View™ triggering for intelligent, automatic triggering on fast, slow and even complex signals
- Frequency Spectrum using FFT analysis
- Automatic capture and REPLAY of 100 screens
- ScopeRecord™ mode gives 30000 points or more per input channel for low frequency signal analysis
- TrendPlot™ paperless recorder mode with deep memory for long-term automatic measurements

What could you do with four channels?

Take multiple measurements simultaneously to track down the root cause of your most complex troubleshooting challenges.
- Easily diagnose timing-related issues with multiple signals
- Real-time inspection of multiple signals simultaneously
- Meaure a combination of input and output signals and system safety interlocks and feedback loops

Fluke 190-502 brings wide bandwidth test applications in the palm of your hand!

With the new 500 MHz model, the verification of telecommunication equipment, high frequency and wide bandwidth systems such as radar equipment has become truly portable. Conveniently verify the systems performance right 'on the spot', fully safely without carrying bulky lab equipment around. Battery powered and fully floating – up to 600V CAT III, for each channel and in between channel references.

Application driven

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

Diagnose VSDs* or power inverters and converters
- Harmonics, transients and loads in three phase power input
- Troubleshoot dc to ac converters for faulty control circuits or output IGBT gate stages
- Cable interface - test PWM output for reflections and transients
- Vpwm measurement to measure the effective voltage on drive outputs

Technologies	Electrical	Electromechanical	Process Controls	Automation	Medical Imaging	Avionics	A/V & Security Systems
Equipment	Switch Gear, Interlocks, Motors, Pumps, Fans, Furnaces, Presses, Mixers, Refrigeration	Actuators, VFD Drives, Linear Motors, Pressure-Level-Flow-Position Sensors, Packaging Equipment	Transducers, Sensors, Loop Controllers, Calibrated Gauges	PLC´s, Sensors, Transducers, Motion Controllers, Rotory Encoders, Scanners, Readers, Printers	XRay, MRI, Ultrasound Imaging equipment	Flight Line Navigation Systems, Communication systems, Radar, On board aircraft control systems	Retail security devices, Surveillance and monitoring equipment, RFID

ScopeMeter 190 Series II

New

Fluke 190-204

Fluke 190-202

CAT III 1000V
CAT IV 600V

CSA c us

True RMS

Optional Accessories

C290	Hard shell protective carrying case for 190 Series II
HH290	Hanging Hook for 190 Series II instruments
SCC290	FlukeView Software (full version) and C290 Carrying Case kit
VPS410-R	Voltage Probe set, 10:1, 300 MHz, one set red
VPS410-G	Voltage Probe set, 10:1, 300 MHz, one set grey
VPS410-B	Voltage Probe set, 10:1, 300 MHz, one set blue
VPS410-V	Voltage Probe set, 10:1, 300 MHz, one set green
VPS420-R	High working voltage probe set 150 MHz, 100:1, CAT III 2000 V (1000 V to earth)
BC190	Mains adapter/battery charger
EBC290	External battery charger for BP290 and BP291
TL175	TwistGuard™ safety designed Test Leads set (1 red, 1 black)
BP290	Li-Ion battery pack, 2400 mAh
BP291	Li-Ion battery pack, 4800 mAh
SW90W	FlukeView® ScopeMeter Software for Windows®
VPS510-X	Wide bandwidth probe set, 10:1, 500 MHz, 600V CAT III

Multiply your diagnostic powers with the new Fluke 190 Series II portable oscilloscopes

Rated all the way to CAT IV

ScopeMeter test tools are rugged solutions built for industrial troubleshooting. The new Fluke 190 Series II are double-insulated floating oscilloscopes safety rated for measurements up to CAT III 1000 V/CAT IV 600 V environments. The new 500 MHz model is rated all the way up to 600 V CAT III.

Measure from mV to kV safely

Independently isolated inputs allow you to make measurements in mixed circuits having different ground references reducing the risk of accidental short circuits. Conventional bench oscilloscopes without special differential probes and isolation transformers can only reference measurements to line power earth ground. With standard probes that cover a wide application range from mV to kV, you are ready for anything from micro-electronics to heavy-duty higher voltage electrical applications.

IP-51 rated for harsh environments

Rugged and shock-proof, ScopeMeter portable oscilloscopes are built for dirty, hazardous environments. With its sealed case, it can endure dust, drips, humidity and airborne pollutants. Every time you reach for ScopeMeter you can be confident it will work reliably wherever your work takes you.

USB connectivity makes it easy to capture and share waveforms

The new Fluke 190 Series II offers two USB ports, electrically isolated from measurement input circuits. Easily transfer data to a PC. Archive and share waveforms with OEMs, colleagues and support staff. Store waveforms, screen captures and instrument setups onto USB memory devices.

FlukeView ScopeMeter software for documenting, archiving and analysis

Get more out of your ScopeMeter with FlukeView® ScopeMeter® SW90W Software for Windows.
• Documentation—transfer waveforms, screens and data to your PC for printing or importing data into a report
• Add text to ScopeMeter settings—give operators guidance when recalling settings
• Archive—create a library of waveforms for easy reference, waveform comparison, or pass/fail testing
• Analysis—use cursors, perform spectrum analysis or export data to another analysis program

A range of application notes is available.
See the Fluke website.

Included Accessories

Fluke 190 Series II 4-channel instruments include a set of four probes, hanging strap, handstrap, USB cable with mini-B connector, double capacity Li-ion battery BP291, battery charger/power adapter BC190, a FlukeView demo package and users manuals on CD-ROM. The /S-versions also include the C290 hard-shell carrying case and the FlukeView software package. The 2-channel models come with two probes plus a set of TL175 test leads and a single capacity battery BP290. The 190-502 also includes two pieces TRM50 coaxial feedthrough terminator.
The SCC290 kit includes: C290 hardshell carrying case and FlukeView® for Windows® software (full version).

Ordering Information

Fluke-190-502/S	Color ScopeMeter (500 MHz, 2 channel), with SCC290-kit
Fluke-190-204/S	Color ScopeMeter (200 MHz, 4 channel), with SCC290-kit
Fluke-190-204	Color ScopeMeter (200 MHz, 4 channel)
Fluke-190-202/S	Color ScopeMeter (200 MHz, 2 channel), with SCC290-kit
Fluke-190-202	Color ScopeMeter (200 MHz, 2 channel)
Fluke-190-104/S	Color ScopeMeter (100 MHz, 4 channel), with SCC290-kit
Fluke-190-104	Color ScopeMeter (100 MHz, 4 channel)
Fluke-190-062/S	Color ScopeMeter (60 MHz, 2 channel), with SCC290-kit
Fluke-190-062	Color ScopeMeter (60 MHz, 2 channel)
AS400	Probe Accessory Extension set for VPS400 Series probes
BP291	Double capacity Li-Ion battery (4800 mAh) pack for 190C Series II
BP290	Single capacity Li-ion battery (2400 mAh) pack for 190-series II
C195	Soft padded carrying case for ScopeMeter and accessories
C290	Protective Carrying Case for Fluke 190-series II
EBC290	External Battery Charger for charging BP290 or BC291 outside the instrument
HH290	Hanging Hook
RS400	Probe Accessory Replacement set for VPS400 series probes
RS500	Probe Accessory Replacement set for VPS510 series probes
SCC290	Software and Case kit for Fluke 190 Series 190 Series II. Includes SW90W and C290.
SW90W	FlukeView® ScopeMeter Software for Windows® (full version)
TRM50	Coaxial 50 Ω feedthrough terminator
VPS410-x	Probe-set, 10:1, 1000V CAT III / 600V CAT IV (colors: blue, green, red, grey)
VPS420-R	Probe-set, bicolor (r/b), 100:1, 150 MHz, 1000V CAT III / 600V CAT IV, working voltage (voltage between probe tip and reference lead): 2000V CAT III / 1200V CAT IV.
VPS510-x	Wide bandwidth probeset, 500 MHz, 10:1, 600V CAT III

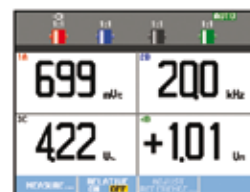## Connect-and-View™ triggering for an instant, stable display

If you've used other scopes, you know how tricky triggering can be. If settings are incorrect, results can be unstable or incorrect. Connect-and-View™ automatically sets up correct triggering by recognizing signal patterns. Without touching a button, you get a stable, reliable and repeatable display of virtually any signal including motor drive and control signals. It's especially fast and convenient when you're measuring a number of test points in rapid succession.

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

Built-in digital multimeter (2 channel models)

190 Series II models with isolated dual input scope and dedicated digital multimeter. Conveniently switch from waveform analysis to precise multimeter measurements using the built in 5000 count digital multimeter. Measurement functions include Vdc, Vac, Vac+dc, resistance, continuity and diode test. Measure current and temperature using suitable shunt, probe or adapter with wide range of scaling factors.

The built in multimeter provides convenient precision measurements.

Automatic capture and replay op 100 screens

Scope users know how frustrating it is to see a one-time anomaly flash by, never to be seen again. Not with the ScopeMeter 190-series! Now you can look back in time with the touch of a button. In normal use, the instrument continuously memorizes the most recent 100 screens. At any moment in time, you can 'freeze' these latest screens and scroll through them picture-by-picture or replay them as a 'live' animation. Cursors and zoom can be used for further analysis. You can even use the advanced trigger capabilities to capture up to 100 specific events. Two sets of 100 screens with individual time stamps can be stored for later recall or download to a PC.

See dynamic signal behavior instantly

The digital Persistence mode helps to find anomalies and to analyze complex dynamic signals by showing the waveforms amplitude distribution over time using multiple intensity levels and user selectable decay time – it's as if you're looking at the display of an analog, real time oscilloscope! A fast display update rate reveals signal changes instantaneously, useful for instance when making adjustments to a system under test.

Recommended Accessories

| SW90W | SCC290 | VPS420-R | EBC290 | AS400 |

ScopeMeter® 120 Series

Fluke 125

Fluke 124

Fluke 123

600V CAT III

C CSA US

True RMS

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

- Dual-input 40 MHz or 20 MHz digital oscilloscope
- Two 5,000 counts true-RMS digital multimeters
- A dual-input TrendPlot™ recorder
- Bus Health Test for industrial bus systems (Fluke 125)
- Connect-and-View™ trigger simplicity for hands-off operation
- Power Measurements and Harmonics measurement (Fluke 125)
- Shielded test leads for oscilloscope, resistance and continuity measurements
- Up to 7 hours battery operation
- 600 V CAT III safety certified
- Optically isolated interface for PC and Printer connection (optional)
- Rugged, compact case

Connect-and-View™ triggering for an instant, stable display

Scope users know how difficult triggering can be. Wrong settings show unstable and sometimes wrong results. Fluke's unique Connect-and-View recognizes signal patterns, and automatically sets up correct triggering. It provides a stable, reliable and repeatable display of virtually any signal - including motordrive and control signals - without touching a button. Signal changes are instantly recognized and settings adjusted for - once again - a stable display.

Use TrendPlot™ to help find intermittents fast

The toughest faults to find are those that happen only once in a while: intermittents. They can be caused by bad connections, dust, dirt, corrosion or simply broken wiring or connectors. You may not be around to see it – your Fluke ScopeMeter will. In this "paperless recorder" mode, you can plot the minimum and maximum peak values and average over time – up to 22 days (Fluke 190 Series) or 16 days (Fluke 120 Series).
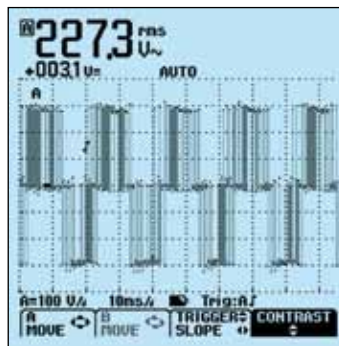
Bus Health mode (Fluke 125)

Bus Health mode gives a clear "Good/Bad" indication for the electrical signals on industrial buses and networks, such as CAN-bus, Profi-bus, RS-232 and many more. The Fluke 125 validates the quality of the electrical signals as soon as any electrical signals are passed along the network.
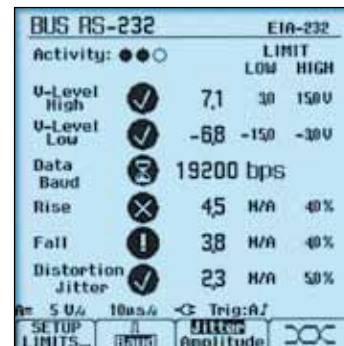
Included Accessories

PM 8907 line adapter/charger, STL120-III shielded test leads set (1 red, 1 grey) including hook clips, BB120 shielded BNC adapter, BP120MH NiMH battery pack, VPS40-III wide bandwidth Voltage Probe (Fluke 124/125), TL175 Safe-guard testlead, i400s current clamp (Fluke 125), Getting Started booklet, user's manual (cd-rom)

Ordering Information

Fluke 123	Industrial ScopeMeter® (20MHz)
Fluke 123/S	Industrial ScopeMeter® (20MHz) + SCC120 kit
Fluke 124	Industrial ScopeMeter® (40MHz)
Fluke 124/S	Industrial ScopeMeter® (40MHz) + SCC120 kit
Fluke 125	Industrial ScopeMeter (40 MHz)
Fluke 125/S	Industrial ScopeMeter (40 MHz) + SCC120 kit
SCC120	FlukeView® Software + OC4USB Cable + Carrying Case
OC4USB	USB Interface Cable
PM9080	RS-232 Interface Cable
DP120	Differential Voltage Probe
ITP120	Isolated Trigger Probe
SW90W	FlukeView Software
BHT190	Set of 3 break-out adapters (Fluke 125)

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

Bus Health mode allows for an analysis of the signal quality on an industrial network.

See page 85 for specifications.

Recommended Accessories

SCC120	C125 See page 124	DP120 See page 86	OC4USB See page 86	SCC128 See page 125

FLUKE ®

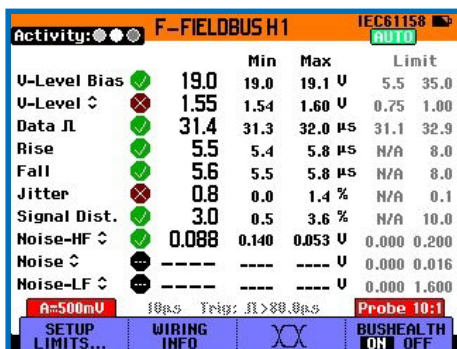## Fluke 225C/S Industrial Networks and Bus Health Test

Built on the Fluke 190C-series, the 225C/S makes Bus Health Test analysis on the electrical signals on an industrial bus or network, giving a clear "Good", "Weak" or "Bad" validation of the relevant parameters, presented next to the actual measurement value. The Fluke 225C/S can make the signal quality validation as soon as electrical signals are passed along the network, without looking at the data content. It finds errors like improper cable connections, bad contacts, incorrect grounding and missing or superfluous terminators.

Included Accessories

BHT190	Set of three break-out adapters for industrial networks
BC190	Mains adapter/Battery charger
BP190	NiMH battery pack (installed)
VPS210	Voltage probe sets (1 red, 1 grey)
TL175	SafeGuard(r) Testlead set
C190	Hard shell protective carrying case
OC4USB	Optically insulated USB interface cable for PC connectivity
SW90W	FlukeView software package (full version)

Ordering Information

| 225C/S | Color ScopeMeter (200 MHz, 2.5 GS/s) with Bus Health Test capabilities and SCC-kit. |

Typical status overview of a bushealth measurement.

General ScopeMeter Specifications

Model:	190-502	190-204	190-202	190-104	190-102	190-062	225C/S	125	124	123
Oscilloscope Specifications										
Bandwidth	500 MHz	200 MHz		100 MHz		60 MHz	200 MHz	40 MHz		20 MHz
Max. real time sample rate	5 GS/s	2.5 GS/s		1.25 GS/s		625 MS/s	2.5 GS/s	25 MS/s		
Input sensitivity	2 mV/div.							5 mV/div.		
Max. timebase speed	1 ns/div.	2 ns/div.		4 ns/div.		10 ns/div.	5 ns/div.	10 ns/div.		20 ns/div.
Inputs and digitizers	2 + Ext.Tr.	4	2 + Ext.Tr.	4	2 + Ext.Tr.	2 + Ext.Tr.	2 + Ext.Tr.	2 (+ Ext.Trig. Optional)		
Independently floating isolated inputs	600 V CAT III	1000 V CAT III, 600 V CAT IV					600 V CAT III	-		
Max.record length .... In Scope mode .... In ScopeRecord mode	10 000 samples per trace 30 000 min/max pairs						3000 27500	512 min/max pairs per input		
Glitch capture	8 ns peak detect at full timebase range						50 ns	40 ns		
True RMS multimeter built-in (5000 counts)	yes	-	yes	-	yes			dual 5000 counts DMM		
Dedicated test capabilities	V/Hz ratio	-	V/Hz ratio	-	V/Hz ratio		Bus health test	-		
General Specifications										
Mains adapter/battery charger incl. (type)	BC 190							PM8907		
Battery installed	BP291	BP291	BP290	BP291	BP290	BP290	BP190	BP120MH		
Size	265 x 190 x70 mm						**	232 x 115 x 50 mm		
Weight	2.1 kg	2.2 kg	2.1 kg	2.2 kg	2.1 kg		2 kg	1.2 kg		
Safety certified	1000 V CAT III / 600 V CAT IV							600 V CAT III		

ScopeMeter® Accessories

| VPS410-X | VPS420-R | VPS510-x | STL120-III | VPS40-III |

ScopeMeter series	190-series II			120-series		
	VPS410-x	**VPS420-R**	**VPS510-x**	**STL120-III**	**VPS40-III**	**DP120**
Description	Voltage probe	High working voltage probe*	Wide bandwidth voltage probe	Shielded Test leads	Voltage probe	Differential Voltage Probe
Colors available	red, grey, blue, green	bicolor (red & black)	red, grey, blue, green	red + grey (1 set)	black	red + grey (1 set)
Attenuation	10:1	100:1	10:1	1:1	10:1	200:1 / 20:1
Bandwidth	300 MHz	150 MHz	500 MHz	12.5 MHz	40 MHz	20 MHz
Length	1.2 m	1.2 m	1.2 m	1.2 m	1.2 m	1.5 m (2x)
Safety Rating CAT II	--	--	--	1000 V	1000 V	1000 V
Safety Rating CAT III	1000 V	1000 V*	300 V	600 V	600 V	600 V
Safety Rating CAT IV	600 V	600 V*	--	--	--	--

* High Working Voltage Probe is specified for working voltages (between probe tip and reference lead) up to 2000V in CAT III or 1200V in CAT IV environments. Reference lead voltage (between reference lead and earth ground): 1000V in CAT III, 600V in CAT IV. These specification applies only when used with Fluke 190-series II Test Tool.

| PM9091/9092 | PM9081 | PM9082 | PM9093 | DP120 |

	PM9091	PM9092	PM9081	PM9082	PM9093
Description	Safety designed 50 Ω BNC Cable set (1 red, 1 black, 1 grey)		Dual banana plug (m) to female BNC	Dual banana jack (f) to BNC plug (m)	BNC (m) to dual BNC (f) 'T-piece'
Length	1.5 m each	0.5 m each	--	--	--
Safety Rating CAT III	300 V	600 V	600 V	600 V	10:1

| RS400 | AS400 | BP291 | OC4USB | EBC290 |

RS400	Probe Accessory Replacement set for VPS200 and VPS400 series probes
AS400	Accessory Extension set for VPS200 and VPS400 series probes
PM9080	RS232 interface cable for 120-series
OC4USB	Optocoupler to USB interface cable for 120 series
BP120MH	Ni-MH battery pack for Fluke 120-series and Fluke 43B
BP290	Single capacity Li-ion battery pack for 190-series II
BP291	Double capacity Li-ion battery pack for 190-series II
EBC290	External battery charger for BP290 and BP291
TRM50	Coaxial 50 Ω feedthrough terminator
RS500	Probe Accessory Replacement set for VPS510 series probes
C437-II	Hard shell protective carrying case with rollers for 190-II and 430-II
RF-AM90	RF Detector and Demodulation probe