

FLUKE®

ScopeMeter® Series II

It Works

A Truly Integrated Digital Storage Oscilloscope and Digital Multimeter



105

ScopeMeter Series II is a battery powered, combination scope and meter designed for measurements on-the-go. Just push the MEASURE MENU button; select one of 30 measurements, and ScopeMeter Series II automatically configures itself to take the desired reading.

With ScopeMeter Series II, good waveforms are automatic. While probing from test point to test point, the CONTINUOUS AUTOSET feature instantly adjusts the timebase and amplitude. Manual controls are still there, but Series II is so fast and easy, why use anything else!

Designed with a sealed, ruggedized case, the ScopeMeter Series II performs reliably, even in wet, dusty, or dirty environments. And the backlit screen makes for easy readings in bright light and no-light situations.

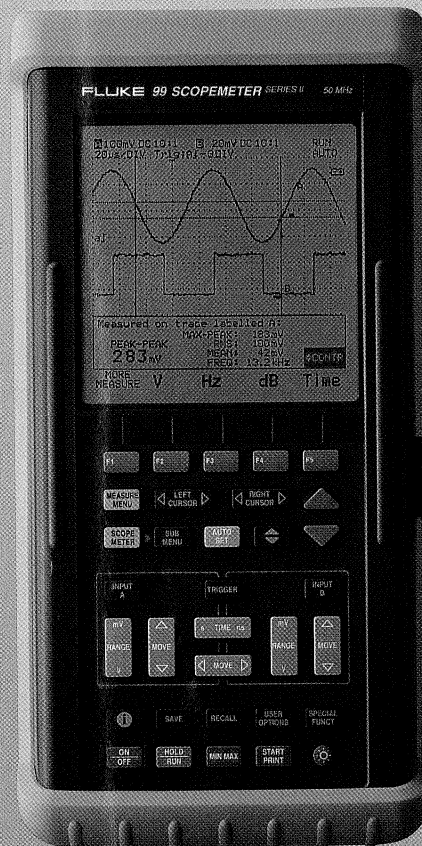
Fluke offers five ScopeMeter Series II models to choose from: the 91, 92, 96, 99, and the new 105. Discover how the most popular, portable combination scope and meter can make your job faster and easier.

ScopeMeter: Ideal for Diagnosing Today's Power Quality Problems

Whether it's an overheating motor, spikes on a circuit, or dimming, flickering lights, the ScopeMeter Series II is ideal for uncovering the source of power quality problems in complex electrical circuits. Series II gives the best accuracy and versatility available in "on-the-go," battery powered instruments, and measures automatically.



3 Year Warranty



99

Other Special Features of All Models

INFORMATION: No matter which function you are using, on-line information is just a button away.

MIN/MAX: Simultaneously graph and display Min/Max/Average measurements over time for monitoring trends and intermittents.

PRINT: Print directly from ScopeMeter Series II, or download to a PC for further analysis.

SAVE and CURSORS (Models 96, 99, and 105 only): Large non-volatile memory stores screen images, setups, and waveforms; cursors enable over 15 precise waveform measurements.

There's a ScopeMeter Designed For You.

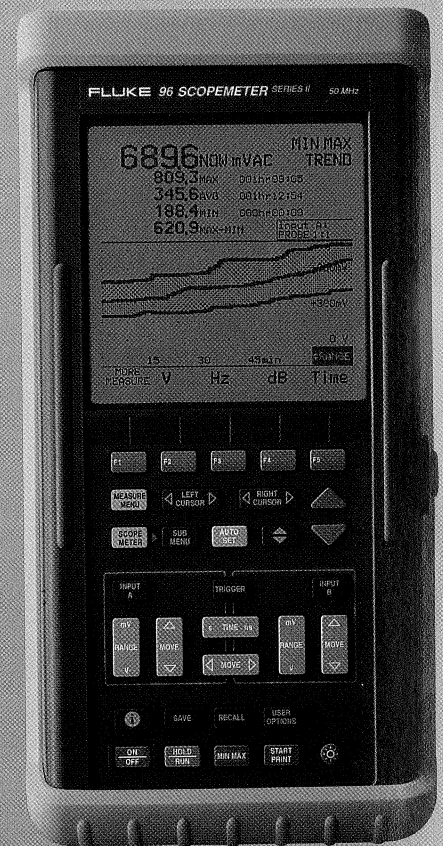
Five ScopeMeter Series II models are available from Fluke, providing unequalled versatility.

Model 91: Fluke's lowest priced ScopeMeter, the Model 91 is best suited for applications needing a single input channel digital oscilloscope. The Model 91 features an analog-like backlit display, continuous autoset, a full-featured true rms multimeter with special modes, frequency counter, direct access measurement menu, TrendPlot™, current clamp scaling, and on-line help messages. Screen transfers can be made to a PC (optional interface cable required). Sealed against the elements and protected by a shock resistant holster with battery or ac line power, the Model 91 works wherever you work.

Model 92: All the features of the Model 91, plus a second input channel.

Model 96: Adding to the capabilities of the Model 92, the Model 96 provides measurement cursors and memory functions that save graphic screen images, capture waveforms, and enable front panel setups. Like the Model 92, screen transfers can be made to a PC. Screen readout(s) and waveform(s) can now be transferred directly to a printer, using the optional printer cable.

Model 99: All the performance and features of the Model 96, plus waveform math/filter capability, a signal generator, component tester, and more memory storage for screens, waveforms, and setups. Offering remote operation over RS-232 interface cable, the Model 99 is portable, powerful and easy to use.



96

Wherever You Work.

Model 105: The latest addition to the ScopeMeter family of test tools, the Model 105 has all the features of the Model 99, plus a 100 MHz input bandwidth, 5 ns time base setting, and 5-hour NiCad battery. The wider bandwidth is ideal for high-end users accustomed to a 100 MHz scope for catching those fast edge signals. The 105 includes FlukeView™ ScopeMeter software (DOS and Windows) and the PM 9080/001 Interface Cable.

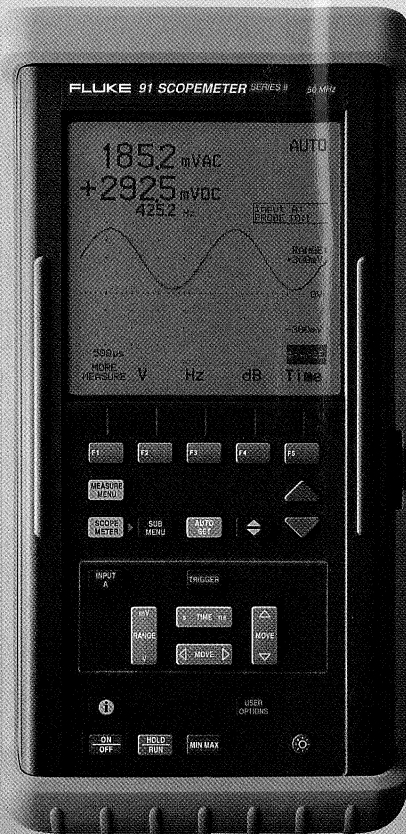


92

Safety Note: Warning for Measurements >42V Peak (30V RMS)

Similar to a safety-designed multimeter, but unlike a conventional oscilloscope, the ScopeMeter input connectors have no exposed metal. They are fully insulated to protect against electrical shock. The ScopeMeter COM (common) inputs (Input A red BNC shield, Input B grey BNC shield, and black banana jack) are connected internally via self-recovering fault protection. Any voltage on one COM input will be present on all COM connections.

Need Technical Assistance?
Call your local Fluke sales office or
1-800-44-FLUKE
TOLL FREE IN THE U.S.
(905) 890-7600 in Canada



91

Size

10.2" L x 5.1" W x 2.4" D
(260 mm L x 130 mm W x 60 mm D)
With Holster—10.8" L x 5.5" W x 2.5" D
(275 mm L x 140 mm W x 65 mm D)

Weight

3.3 lb (1.5 kg),
With Holster—4.0 lb (1.8 kg)

Display

Super Twisted Liquid Crystal
Backlight: Electroluminescent

Power Supply

Internal Battery Pack: NiCad 4.8V
Operating Time: 4 hours typical, with backlight on (91, 92, 96, 99);
5 hours typical (105)
Line Voltage Adapter/Battery Charger: Standard (included).
Charging Time: 16 hours typical/20 hours, Model 105
Alternate Battery: 4 alkaline C cells (user supplied, not rechargeable)
External DC Charging Supply: 8V to 20V dc, 5 Watts typical (user supplied using a 5mm power plug)

FEATURES	91	92	96	99	105
MHz Bandwidth	50	50	50	50	100
Number of Channels	1	2	2	2	2
Continuous Autoset	▼	▼	▼	▼	▼
Measure Menu Automatic Setups	▼	▼	▼	▼	▼
Min Max TrendPlot™ - Long Term Recording	▼	▼	▼	▼	▼
Multimeter Display with Full Width Waveform	▼	▼	▼	▼	▼
True RMS Volts	▼	▼	▼	▼	▼
Continuity Beeper	▼	▼	▼	▼	▼
Time/Division (10 ns/div to 60 sec/div) (5 ns/div to 60 sec/div)	▼	▼	▼	▼	▼
Volts/Division (1 mV/div to 100V/div)	▼	▼	▼	▼	▼
Digital Trigger Delay (Cycles, Events, Time & Zoom)	▼	▼	▼	▼	▼
Special Multimeter Modes (RPM, Temp & More)	▼	▼	▼	▼	▼
Scope Input Current-Clamp Scaling - Read Amps	▼	▼	▼	▼	▼
Oscilloscope Cursor Readings	▼	▼	▼	▼	▼
Glitch Capture - 40 ns	▼	▼	▼	▼	▼
Screen Memory			5	10	10
Waveform Memory			10	20	20
Set-up Memory			20	40	40
Waveform Math & Filter				▼	▼
Signal Generator Output - 4 Fixed Frequencies				▼	▼
Component Tester Output - Volts & Current				▼	▼
Optically Isolated RS-232-C Interface			▼	▼	▼*
Printer Output			▼	▼	▼
Waveform & Screen Transfers & Remote Operation	scrn to PC	scrn to PC	scrn to PC	▼	▼*
Backlit Display	▼	▼	▼	▼	▼
On Line Information & Help Function	▼	▼	▼	▼	▼

*Interface cable and FlukeView™ software included

FLUKE SCOPEMETER® SERIES II SPECIFICATIONS

SCOPE MODE

Continuous Autoset Hands-free signal probing. Continuously follows input signals from 15 Hz-50 MHz (100 MHz in the Model 105) and automatically selects the proper time base, input range and trigger level.

MIN MAX Envelope Mode Record the waveform excursions with a gray scale envelope on both inputs.

40 ns Glitch Detect Sweep speeds 1 μ s/div or slower on Input A

Analog-Like Grey-Scale Display

Waveform Average Smoothing up to 256 waveforms, 10 samples in Roll Mode

The Fluke 91 is single input. All references to "Dual input" or "Input B" do not apply.

Vertical

Frequency response, -3 dB	DC to > 50 MHz; (DC to > 100 MHz in Model 105)
AC coupled	<10 Hz direct, <1 Hz with 10:1 probe
Coupling	AC, DC, Ground
Rise time	<7 ns (<3.5 ns for Model 105)
Sensitivity (at full 8-bits)	1 mV to 100V / div to 1 kV / div with 10:1 probe
Current probe scaling	1 mA / div to 100A / div
Modes	A-, A, B, -B, A+B, A-B, A=x B=y
Input Impedance	1 M Ω , 25 pF direct, 10 M Ω , 13 pF with 10:1 probe
Vertical resolution	8 bit (256 levels)
Accuracy	\pm (2%+1pixel)

Horizontal

Sample Rate	25 ms/s
Modes	Recurrent, single shot, roll
Ranges	
Recurrent	10 ns to 1s / div (5 ns to 1s / div Model 105)
Dual input alternating	10 ns to 20 μ s / div (5 ns to 20 μ s / div Model 105)
Dual input chopped	50 μ s to 1s / div
Single shot	100 ns to 1s / div
Dual input alternating	100 ns to 20 μ s / div
Dual input chopped	50 μ s to 1s / div
Roll	2s to 60s / div
Dual input chopped	2s to 60s / div
Accuracy	\pm (0.1% + 1 pixel)
Record length	256 or 512 samples (10 or 20 divisions)

Trigger

Sources	A, B, or external
Sensitivity : A or B	<0.5 div to 10 MHz <1.5 div to 60 MHz <4.0 div to 100 MHz
External	+0.2V or 2.0V (TTL level compatible)
External Input impedance	1 M Ω , 25 pF direct, 10 M Ω , 13 pF with 10:1 probe
Delay time	-20 div to +640 div
N-cycle trigger	Re-triggers after 2 to 255 trigger cycles
Delay by events	1 to 1023 events after External trigger

Cursor Measurements for Fluke 105, 99 and 96 (up to 5 displayed simultaneously). All voltage measurements can be Amp measurements with optional probe.

Single cursor measurements	V at LEFT, V at RIGHT, Trigger to LEFT, Trigger to RIGHT
Dual cursor measurements	Hz, Vrms, Vmean, Vpk+, Vpk-, Vpk-pk, risetime, phase, dV, dT, 1/dt
Measurement readout	absolute, relative (zero), or % change
Markers selectable on	Hz, Vpk+, Vpk-, Vpk-pk, risetime, phase

Waveform Mathematics (Fluke 99 and 105) Add, subtract, multiply, invert, filter, or integrate input signals. Calculate instantaneous or mean (real) watts with optional current probes.

Zoom Magnifies waveform around the 4th division at the next acquisition (sweep)

Memory for Fluke 105, 99 and 96 (Save or recall)

Setups	Complete instrument setting, 40 for Fluke 105 and 99, 20 for Fluke 96
Waveforms	Individual waveforms with setting, 20 for Fluke 105 and 99, 10 for Fluke 96
Screen (print later image)	All displayed waveforms, readings, and setups, 10 for Fluke 105 and 99, 5 for Fluke 96

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METER MODE

Displays up to four readings and a full screen width scope waveform of Input A or External mV input.

MIN MAX Trend Plot Logs MIN, MAX, and AVERAGE readings to memory at full accuracy and displays all 3 as graphs. Uses automatic vertical scaling and horizontal time compression for hands-free recording from 120 seconds to 40 days full screen.

DC Voltage

Ranges - direct input	100 mV, 300 mV, 1V, 3V, 10V, 30V, 100V, 300V
with PM 8918 10:1 probe	1V, 3V, 10V, 30V, 100V, 300V, 1 kV, 3 kV (LIMIT 600V)
Accuracy	\pm (0.5%+5 counts)
Full scale reading	1000 or 3000 counts
Normal Mode Rejection	> 50 dB at 50 or 60 Hz
Common Mode Rejection	>100 dB at DC, 50, 60, or 400 Hz

AC or AC+DC True-rms Voltage

Ranges - direct input	100 mV, 300 mV, 1V, 3V, 10V, 30V, 100V, 250V
with PM 8918 10:1 probe	1V, 3V, 10V, 30V, 100V, 300V, 1 kV, 2.5 kV (LIMIT 600V)
Accuracy	(valid from 5% of range)
50 Hz to 60 Hz	\pm (1%+10 counts)
20 Hz to 20 kHz	\pm (2%+15 counts)
5 Hz to 1 MHz	\pm (3%+20 counts)
DC to 5 MHz	\pm (10%+25 counts)
Full scale reading	1000 or 3000 counts
Crest factor	Automatic ranging on crest factor overload
Common mode rejection ratio	>60 dB, DC to 60 Hz

Additional METER Mode Measurements

Frequency	1 Hz to 5 MHz
Resolution	4 digits
Accuracy	\pm (0.5%+2 counts)
RPM	(for 2 stroke and 4 stroke engines) selectable: 1 pulse / rev. or 1 pulse / 2 rev.
Range	60 rpm (120 @ 1 pulse/2 rev.) to 99.99 kRPM
Resolution	4 digits
Accuracy	\pm (1%+10 counts)
Duty cycle	Positive or negative pulse
Range	2.0% to 98.0%
Accuracy	(logic or pulse inputs) \pm (0.5%+2 counts)
Pulse width	Positive or negative pulse
Range	500 ns to 0.5s
Resolution	3 digits
Accuracy	\pm (0.5%+2 counts)
dBV	1 volt reference
dBm	reference @ 50, 60, 75, 93, 110, 125, 135, 150, 250, 300, 500, 600, 800, 900, 1000 or 1200 Ω
dBW or audio/RF watts	1, 2, 4, 8, 16 or 50 Ω reference
$^{\circ}$ C or $^{\circ}$ F temperature scaling for optional probes (external 4 mm banana jack input only)	1 mV/degree

OHM mode

(external 4 mm banana jack inputs)	
Ranges	30.00 Ω , 300.0 Ω , 3.000 k Ω , 30.00 k Ω , 300.0 k Ω , 3 M Ω , 30 M Ω
Accuracy	(300 Ω to 30 M Ω , 30 Ω) \pm (0.5%+5 counts), \pm (2.5%+25 counts)
Full scale reading	3000 counts
Measurement current	500 μ A, 70 μ A, 7 μ A, 700 nA, 70 nA
Open circuit voltage	<4V
Full scale voltage	<250 mV to 3 M Ω , <2V to 30 M Ω

Diode Test Mode

(external 4 mm banana jack inputs)	
Open circuit voltage	< or = 4V
Full scale voltage	2.800 V
Measurement current	500 μ A

Meter, OHM, Diode Test, and External mV Mode Functions

Smooth	Moving average of readings for last 8 sec.
Fast	Fast meter update rate
Change alert™	Audible beep when reading changes
TouchHold®	Automatic beep and hold of last stable reading
Relative	Zeros present reading as a reference value
% Change	% change relative to zero reference value
% Scale	% of user set 0% and 100% references
Frequency, RPM, duty cycle, and pulse width measurements and waveforms can also be made on the External mV input at reduced accuracy.	

SIGNAL GENERATOR (FLUKE 105 AND 99 ONLY)

Sinewave	1V at 976 Hz with <3% distortion
Source resistance	400Ω
Squarewave	5V pk-pk at 488 Hz, 976 Hz, or 1.95 kHz
Source resistance	400Ω

Probe Calibrator AC probe adjust at 5V pk-pk at 1.95 kHz

Component Tester	(Fluke 105 and 99 only)
Current mode	0 to +3 mA in max 128 steps
Max voltage	< or = 2V
Voltage mode	-2V to +2V in max 128 steps
Max current	+ or - 1 mA

GENERAL SPECIFICATIONS (ALL MODELS)

The accuracy of all measurements are within ±(% of reading ± number of counts) from 18°C to 28°C. Add 0.1 x (specified accuracy) for each °C <18°C or >28°C.

Display	Super twisted liquid crystal
Size	84x84 mm (4.7" diagonal)
Resolution	240X240 pixels, 25 pixels/div in SCOPE mode
Contrast	User adjustable
Backlight	Electroluminescent (all models)

Power

Internal battery pack	NiCad 4.8V nominal
Operating time	4 hours typical; 5 hours for the Model 105
Line voltage adapter/battery charger	
Charging time	16 hours typical
Alternate battery (user supplied)	4 Alkaline C cells (non rechargeable)
External supply (user supplied)	8 to 20V dc, 5 watt typical via 5 mm jack
Memory back-up battery	CR2032
Save screens, waveforms, and set-ups for up to 3 years with main batteries removed (Fluke 105, 99 and 96).	

Environmental

Temperature:	
Operating	0°C to 50°C
Storage	-20°C to 70°C
Humidity:	
Operating	20°C to 30°C, 90%RH non condensing 30°C to 50°C, 70%RH non condensing
Storage	95% RH
Altitude:	
Operating	3 km (10,000 ft)
Storage	12 km (40,000 ft)
Shock and vibration	According to MIL-T-28800 for class 3
Electromagnetic interference	According to MIL STD 461 to 1V/m
Splash proof and dust proof case	

Mechanical

Size	10.2" L x 5.1" W x 2.4" D (260 mm L x 130 mm W x 60 mm D)
Size with holster	10.8" L x 5.5" W x 2.5" D (275 mm L x 140 mm W x 65 mm D)
Weight	1.5 kg (3.3 lbs)
Weight with holster	1.8 kg (4.0 lbs)

Safety Designed to CAT III per IEC1010 and UL1244 approved for 600V measurements on industrial power distribution systems

Overload protection on A or B	300 Vrms, 600 Vrms with PM 8918 10:1 probe
External input	600 Vrms
Surge protection	4 kV, 6 kV with PM 8918 10:1 probe, per IEC664 and ANSI/IEEE C62.41 test method
Maximum isolation to earth	600 Vrms from any terminal



Optically Isolated RS-232 Interface, 600V isolation

Full PC interface	(Fluke 99 and 105) Transfer setups, waveforms, measurements etc.
Serial printer interface	(Fluke 96, 99 and 105) Epson FX/LQ, HP Thinkjet, HP Laserjet Print screens and waveforms, or log METER and CURSOR readings.
Screen capture	All models with optional software (Fluke View™ Software included with the 105)

Closed Case Calibration All models

Warranty 3 years parts and labor



ACCESSORIES

Included Accessories

PM 9080/001	Optically isolated RS 232 interface adapter (Model 105 only)
PM 9086/001	NiCad battery pack
PM 8907/002	Line voltage adapter/battery charger
PM 8918/002	Safety-designed ScopeMeter Probe set (1 red and 1 grey, 600V rms, 10:1 10 MΩ 15 pF, 1.5m (5 ft))
PM 9083/001	ScopeMeter yellow protective holster
PM 9094/001	ScopeMeter probe accessory set
C75	Accessory case
5322310 32086	Multimeter test lead set (silicone insulated, TL24, TP20, AC20, 2 banana adapters)
4822872 00595	ScopeMeter Series II user manual
4822872 00594	ScopeMeter Series II quick operating guide
SW90D/001	FlukeView™ ScopeMeter for DOS (Model 105 Only)
SW90W/011	FlukeView™ ScopeMeter for Windows (Model 105 Only)

OPTIONAL ACCESSORIES

Probes*

PM 8918/101	1:1 1.5m (5 ft) probe
PM 8918/202	10:1 2.5m (8 ft) probe set
PM 8918/301	10:1 2.5m (8 ft) low pass filter probe
*safety designed probes for electrically isolated measurements with ScopeMeter test tool	

Probe Accessories

PM 9084/001	Probe industrial alligator clips
PM 9085/001	Probe tip hook style test clips
PM 9090/001	Probe pin grabber clips
PM 9094/001	Probe accessory set

Current Probes and Shunts

Y8100	Clamp-on DC/AC current probe 1-200A
80i-110s	Clamp-on DC/AC current probe 0.1-100A for scopes
80i-410	Clamp-on DC/AC current probe 5-400A
80i-500s	Clamp-on AC current probe 1-500A for scopes
80i-1010	Clamp-on DC/AC current probe 1-1000A
80i-1000s	Clamp-on current probe 0.1-1000A for scopes
80i-KW	Clamp-on current/power probe 1-1300A
80J-10	Current shunt 10 mV/A

Special Purpose Accessories

80T-IR	Infrared temperature probe
80T-150U	Universal temperature probe

Cables and Adapters

PM 9080/001	Optically isolated RS232 interface adapter
PM 9082/001	Dual banana jack to male BNC adapters
PM 9091/001	1.5m (5 ft), 50Ω coaxial BNC cables
PM 9092/001	0.5m (1.5 ft), 50Ω coaxial BNC cables
PM 9093/001	T-connector
PM 9095/001	Single banana jack to male BNC adapters

Test Leads

TL20	Industrial test lead set
TL24	Multimeter test leads
TL75	Hard point right angle test lead set

Test Lead Accessories

AC20	Industrial alligator clips
AC80	Industrial hook style clips
TP20	Industrial test probes

Powering and Charging

PM 8906/00n**	Three hour NiCad battery charger
PM 9087/002	Isolated automotive power adapter, 9 to 18V DC
**n=001 (Europe) 230V /003 (North America) 120V /004 (United Kingdom) 230V	

Storage and Transportation/Protective Cases

C95	Soft carrying case
C97	Hard carrying case

Software

SW90D/001	FlukeView ScopeMeter for DOS
SW90W/011	FlukeView ScopeMeter for Windows

ORDERING INFORMATION - U.S. ONLY

Fluke 91	Fluke-91/003 ScopeMeter Series II
Fluke 92	Fluke-92/003 ScopeMeter Series II
Fluke 96	Fluke-96/003 ScopeMeter Series II
Fluke 99	Fluke-99/003 ScopeMeter Series II
Fluke 105	FLK-105/003 Scopemeter Series II

Fluke 97 Fluke-97 ScopeMeter Test Tool