

## ScopeMeter® 190 Series for Medical

## Technical Data

Connect  
and  
View



LISTED



### ScopeMeter 190 Series: Speed, Performance and Analysis power for Medical applications.

The Fluke 190 Series ScopeMeters are high-performance oscilloscopes for demanding applications, and offer specifications usually found only on high-end bench instruments. With bandwidths up to 200 MHz, 2.5 GS/s real-time sampling and a deep memory of 27,500 points per input, these ScopeMeters are ideal for engineers who need the full capabilities of a high-performance oscilloscope in a handheld, battery-powered instrument.

The Fluke MS190 Software kit extends the measurement capabilities of the 190 Series ScopeMeter for use on Medical Imaging Equipment and Video Display systems.

- ✓ Dual input - 60, 100 or 200 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
- ✓ 27,500 points per input record length using ScopeRecord™ mode
- ✓ Automatic capture and replay of 100 screens
- ✓ 24 automatic waveform measurements
- ✓ Cursors, zoom and real-time clock
- ✓ Four hours rechargeable NiMH battery pack
- ✓ 1,000V CAT II and 600V CAT III safety certified
- ✓ Up to 1,000V independently floating isolated inputs
- ✓ Includes a 5,000 counts true-rms multimeter and a TrendPlot™ paperless recorder

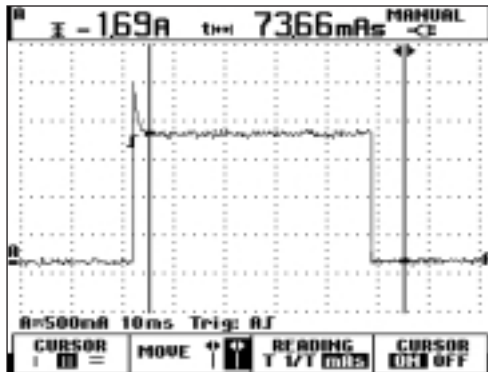
# Specifications 190 Series for Medical

## MS190 SOFTWARE KIT

The MS190 Software kit extends the Fluke 190 Series ScopeMeter with the following additional functionality:

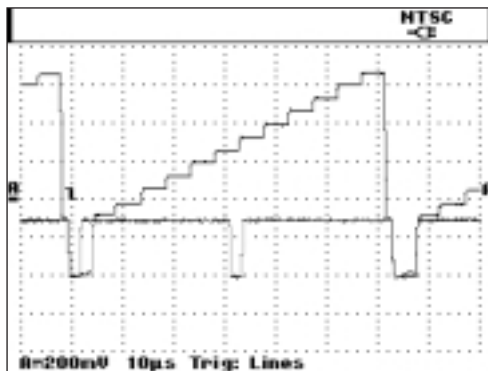
### mAs MEASUREMENT CALCULATES CURRENT OVER TIME

Using the cursors, you can now measure directly the amount of radiation produced by X-ray systems, or the total amount of charge applied to a system.



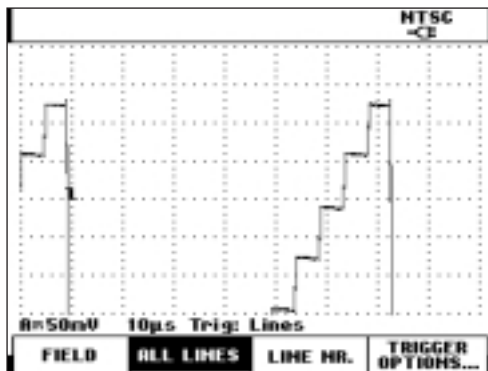
### SMART AVERAGING

gives the averaged waveform over successive acquisitions, reducing noise in the displayed waveform. Thanks to smart averaging, you can now also see an incidental curve of a different waveshape with no effect on the averaged curve! This allows you to see the averaged curve of a sequence of video lines, for example, while still seeing the incidental flyback line flash by! Thanks to smart averaging, the oscilloscope gives an immediate response when the signal makes large changes, for instance when probing around different test points, while retaining the benefits associated with averaging!



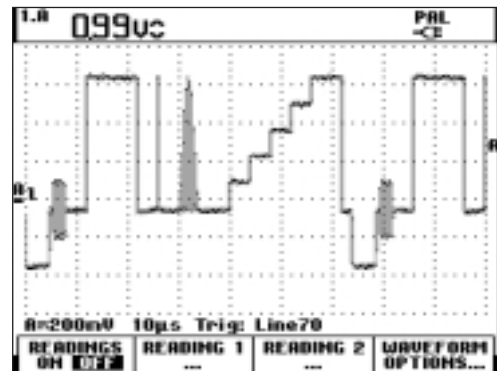
### EXTENDED OFFSET

vertical offset is now extended to a maximum of 16 divisions, allowing vertical zoom-in for study of small details of the signal.



## SELECTABLE PERSISTENCE

a persistence mode with selectable decay time helps to find anomalies in the waveshape and optimizes the display for color information when working with composite color video. Can be used together with dots only mode, best for modulated signals, or with dot join mode for more continuous and stable waveshapes.



## EXTENDED VIDEO TRIGGERING

next to its triggering capability for standard, interlaced TV signals, the instrument now triggers on high-resolution, non-interlaced video systems. The ScopeMeter 190 will trigger on all lines (non-selective), or can select an individual video line from systems with up to 2800 lines per frame.

## MA190 ACCESSORY KIT

The MA190 accessory set enables interconnection of the Fluke 190 for use in the field of Medical Imaging and Video systems. This kit includes:

- 50 Ω BNC feedthrough terminator, in insulated enclosure, to maintain proper termination of test connections during measurement
- 50 Ω BNC terminator with 10:1 signal attenuation; keeps test terminal properly loaded while getting optimum signal amplitude to benefit from the instrument's extended offset range
- 1 Ω current shunt for current measurements, in insulated enclosure
- safety-designed BNC cable, 1.5 m (5 ft), with plastic connectors for safe connection to test terminals even when not at ground potential. Also reduces wear of the ScopeMeter's input connectors
- insulated BNC(f) to 4 mm banana plug adapter;
- dual 4 mm banana receptacles (1 red, 1 black).

### **SPECIFICATION CHANGES AND ADDITIONS**

For instruments that have the MS190 Software Extension installed, the full specification of the Fluke ScopeMeter 190 Series applies, with the following additions:

#### **OSCILLOSCOPE MODE**

##### **DISPLAY AND ACQUISITION**

Channels displayed	input A, input B, dual channel
Display modes	smart averaging, normal averaging, selectable persistence, invert, replay
Smart averaging	displays averaged curve; incidental waveforms that differ too much from the average curve are displayed but do not contribute to the averaged curve
Averaging factor	selectable: 2x, 4x, 8x, 64x or off
Selectable persistence decay time	short, medium, infinite or off; can be used with <i>dots only</i> display or with <i>dot join</i> mode

##### **TRIGGER AND DELAY**

Video Triggering interlaced	NTSC, PAL, PALplus, SECAM. Selects field 1, field 2, lines or on user selected line from a frame
non-interlaced	for line counts up to 2800 lines per frame and video scan rates up to 65 kHz; triggers on fields, on lines or on user-selected line

##### **CURSOR MEASUREMENTS**

Dual vertical lines	time between cursors, voltage between markers, 1/T (in Hz), mVs, mAs
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##### **ZOOM**

Horizontal zoom	Up to 8x
Vertical zoom	using position control (offset) and vertical sensitivity

##### **OFFSET RANGE**

Max. offset for viewing positive-going signals	16 divisions for input sensitivity settings 5...50 mV/div (50...500 mV/div. when using 10:1 probe or TA190-50R terminator); 8 divisions for other sensitivity settings
Max. offset for viewing negative-going signals	8 divisions for all vertical sensitivity settings

See brochure "Oscilloscopes for field applications" and ScopeMeter 190 Series technical datasheet for full details on the standard version of the ScopeMeter 190 Series.

#### **MA190 ACCESSORY KIT**

accessory set for use with Fluke 190 Series ScopeMeter, containing the following accessories:

TR190-50R	50 $\Omega$ BNC feedthrough terminator; max. input voltage 5V
TA190-50R	50 $\Omega$ BNC terminator with 10:1 feedthrough attenuation; max. input voltage 5V
CS190-1R	1 $\Omega$ current shunt, 500 mA max., in insulated BNC feedthrough housing;
BNC to BNC cable	safety-designed BNC cable, 1.5 m (5 ft)
PM9081	female BNC to dual 4 mm banana plug adapter, safety-designed (1 piece)
4 mm banana to banana adapter	for connecting standard test leads to the current shunt (2 pieces) using PM9081

## Compatibility

### MS190 COMPATIBILITY

The Fluke MS190 Software Extension kit can be loaded into any Fluke 190 Series ScopeMeter that has software version V3.0 or higher installed. Instruments with another software version can be upgraded through Fluke authorized service centers.

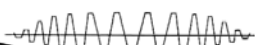
### MS190 Installation requirements

- Fluke 190 Series ScopeMeter, with software V3.0 or higher. You can find the status of your instrument by selecting the 'USER' menu, then 'Version & Cal'. The instrument will then indicate the software version currently in your instrument;
- a PC, running Windows 95, 98, 2000 or NT 4.0, equipped with a CD-ROM drive and with a free RS-232 port to perform the software installation;
- a PC with Internet access to register and receive the unique installation code key (does not have to be the same PC as used for the installation procedure);
- a PM9080/001 optically isolated serial interface cable (as included with the Flk-196M and Flk-199M and with the SCC-190 kit and the ScopeMeter 190S models), for data interconnection between the PC's RS-232 port and the instrument.

Visit us at: [www.fluke.com/scopemeter](http://www.fluke.com/scopemeter)

## Ordering information

MS190	Software extension kit. See also 'MS190 Compatibility' and 'MS190 Installation Requirements'.
MA190	Accessory kit for Medical and video applications.
FLK-199M	Complete 200 MHz ScopeMeter 199 Medical. Has Medical Software extension MS190 installed and includes MA190 accessory kit, SCC190 software and carrying case kit and universal power adapter.
FLK-196M	Complete 100 MHz ScopeMeter 196 Medical. Has Medical Software extension MS190 installed and includes MA190 accessory kit, SCC190 software and carrying case kit and universal power adapter.
SCC190	Carrying case, FlukeView Software and optically isolated serial interface cable for Fluke 190 Series (connects to standard RS-232 port of a PC)

  
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10255-ENG-01