

# MassaSonic™ M-5000/95 Smart Ultrasonic Sensor

The MassaSonic™ M-5000/95 Smart Ultrasonic Sensor incorporates state-of-the-art ultrasonic and microprocessor technology to provide precision non-contact distance measurement for factory automation or industrial process control. The M-5000/95 stands out over all other systems because of its extraordinary ease of operation, genuinely user-friendly software, versatility in user-controlled outputs, and the ability to be set up *without using a target*.

The sensor transmits narrow beam sound pulses at a user-selected rate (or it can be externally triggered), processes return echoes, and produces several outputs dependent on the position of the target.

Operating from 12 to 28 V DC, the M-5000/95 provides non-contact measurement over a nominal target range of 0.3 to 4.0 m (1 to 13 ft.). Outputs include a 0 to 20 mA or 4 to 20 mA DC analog current loop, two independent setpoint switches, and echo status by both an LED indicator and an Echo Status Output switch. The system parameters and outputs are fully user programmable via an RS-485 data link, thereby eliminating the sealing and tampering problems associated with adjustment potentiometers or pushbuttons. Some additional programmable features include: analog output slope, sampling rate, averaging of multiple target distance measurements, loss-of-echo time-out, and setpoint hysteresis.

Massa's extremely user-friendly software works with a PC running under Windows® 95/98/NT/2000/XP operating systems. The M-5000/95 connects to a serial port of the PC using an RS-485/RS-232 converter. The RS-485 data link allows up to 32 M-5000/95 sensors to be on the same multi-drop communications network.

For users that prefer not to use a PC, the sensors can be programmed at the factory to the customer's exact specifications for true "plug and play" operation.

Other features of the M-5000/95 include: industry standard 30 mm diameter CPVC housing, operation from -20°C to 65°C with built-in temperature compensation, diagnostic and monitoring outputs, and protection from over-voltage, short circuits, and reverse polarity.

For more information visit our web site at [www.massa.com](http://www.massa.com).



GENERATIONS AHEAD IN SONAR & ULTRASONIC TECHNOLOGY

**MASSA PRODUCTS CORPORATION**  
280 Lincoln Street, Hingham, MA 02043 USA



## FEATURES

- Analog & Setpoint Outputs
- Plug & Play Setup
  - No Target Needed
- Software Set Span and Zero
  - No Pots or Pushbuttons
  - Tamperproof Settings
- Easy to Use Setup Software
  - Windows®
  - 95/98/NT/2000/XP
- Built-in Temperature/Sound Speed Compensation
- Up to 32 Sensors on RS-485 Multi-drop Loop

## APPLICATIONS

- Automatic Filling Operations
- Mechanical Positioning
- Roll Diameter Measurement
- Web Loop Monitoring
- Liquid Level Control
- Automatic Packaging
- Machine Tool Fluid Level
- Paper/Plastic Film Processing



## M-5000/95 SPECIFICATIONS

### PERFORMANCE *(Typical at 24 V DC, 22° C, and 50% RH)*

Ultrasonic Frequency:	95 kHz
System Beam Angle:	8° Conical
Target Detection	
Minimum Distance:	1 foot (0.3 m)
Maximum Distance:	13 feet (4.0 m) <i>(Maximum programmable distance is 20 feet (6.0 m). Distances out to 20 feet only under special applications. Consult factory.)</i>
Measurement Resolution:	.04 inches (1 mm)
Power Required:	12 to 28 V DC (reverse polarity protected), 80 mA max.
Temperature Compensation:	Internal probe

### PROGRAMMABLE OUTPUTS *(Can be Factory Preset)*

Current Loop Output:	0 to 20 mA or 4 to 20 mA DC sourcing, 12-bit resolution, invertible
Span & Zero Distance:	Programmable from 12 to 240 inches
Loss-of-Echo Options:	0, 3.5, 4.0, 20.0, or 20.5 mA
Two Setpoints and Echo Status:	Protected current sink, open drain N-channel MOSFETs, 28 V DC max., 100 mA max.
Setpoint Distances:	Programmable from 12 to 240 inches
Setpoint Hysteresis:	0% to 93%, in 1% increments

### PROGRAMMABLE SAMPLING SETTINGS *(Can be Factory Preset)*

Sampling Rate:	0.1 Hz to 20 Hz in 0.1 Hz increments
Trigger Modes:	Internal, internal with trigger output, external, external with delay, manual
Target Distance Averaging:	Rolling Average: up to 32 samples, or Boxcar Average: up to 1,024 samples
Loss-of-Echo Time-out:	Up to 255 consecutive samples

### ADDITIONAL OUTPUTS

Diagnostic LED:	Power, loss of echo, system error
Echo Monitor:	Amplified ultrasonic signal
Communications:	RS-485, transient protected, multi-drop up to 32 sensors

### MECHANICAL

Housing Dimensions:	30 mm diameter M-30X1.5 threaded tube, 115 mm long
Housing Material:	CPVC
Cable:	10 conductor, PVC jacket, 24 AWG, 10 ft. (3 m), user-extendable to 1,500 ft.

### ENVIRONMENTAL

Operating Temperature:	-20°C to 65°C
Storage Temperature:	-40°C to 85°C
Relative Humidity:	0 to 95%, non-condensing

### PROGRAMMING REQUIREMENTS

Communications Converter:	RS-485/RS-232 with automatic send data control
Operating System:	Windows® 95/98/NT/2000/XP

## ORDERING INFORMATION

P/N 200547-501

M-5000/95 Full Sensor Kit  
which includes:

p/n 300306-501	MassaSonic M-5000/95 Smart Ultrasonic Sensor
p/n 7873-1	Locknuts (Qty. 2)
p/n 7875-1	Installation & Operation Guide
p/n 200511-1	Mounting Bracket
p/n 7868-1	Communications Converter
p/n 7876-1	Installation & Setup Software (CD or Disks)

P/N 200547-502

M-5000/95 Sensor & Locknuts

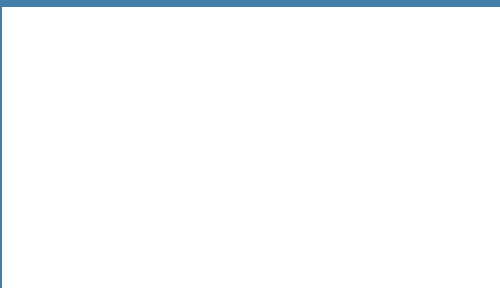
P/N 200547-503

M-5000/95 Sensor, Locknuts &  
Mounting Bracket

Custom configurations available  
for OEM quantities.

Consult factory for custom  
preset M-5000/95 Sensors.

## REPRESENTED BY:



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