



mPulse® Series Sensors

Model M-5000/220

Factory Automation | Non-Contact Measurement | Reliable

The MassaSonic® mPulse® Series Model M-5000/220 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 mPulse Series Sensor stands out over 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 mPulse 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 VDC, mPulse Series Sensors provide non-contact measurement over a nominal target range of 100 mm to 1 m (4 inches to 40 inches). Outputs include a 4 to 20 mA or 0 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 timeout, and setpoint hysteresis.

Massa's extremely user-friendly software works with a PC running Windows® 10, 8, 7, Vista, or XP SP3 operating systems. MassaSonic mPulse Sensors connect to a serial port of the PC using a USB/RS-485 or RS-232/RS-485 converter. The RS-485 data link allows up to 32 mPulse 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 mPulse Series Sensors include: industry standard 30mm 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.



GENERATIONS AHEAD IN SONAR & ULTRASONIC TECHNOLOGY

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mPulse Series Sensor

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® 10, 8, 7, Vista, and XP SP3
- Up to 32 Sensors on RS-485 Multi-drop Loop
- Built-In Temperature/Sound Speed Compensation
- Low Cost of Ownership (CoO)

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





mPulse Series Model M-5000/220 Performance Specifications

(Typical 24VDC, 22°C, and 50% RH Air)

Performance	
Operating Frequency	220 kHz
Target Detection Distance	4 inches (100 mm) to 40 inches (1 m)
Measurement Resolution	0.01 inches (0.25 mm)
System Beam Angle	8° Conical
Power Required	12 to 28 V DC (reverse polarity protected) 80 mA max.
Temperature Compensation	Internal Probe
Programmable Outputs	
Current Loop Output	0 to 20 mA or 4.5 to 20 mA DC sourcing, 12-bit resolution, invertible
Span & Zero Distance	Programmable from 4 to 40 inches (100 mm to 1 m)
Loss of Echo Options	0, 3.5, 4.0, 20.0 or 20.5 mA
Setpoint and Echo Status	Protected current sink, open drain N-channel MOSFETs, 28 VDC max., 100 mA max.
Setpoint Distances	Programmable from 4 to 40 inches
Setpoint Hysteresis	0% to 89%, in 1% increments
Programmable Sampling Settings	
Sampling Rate	0.1 Hz to 100 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 echo
Communications	RS-485, transient protected, multi-droop up to 32 sensors
Mechanical/Environmental	
Housing Dimensions	30 mm diameter M-30X1.5 threaded tube, 100 mm long
Housing Material	CPVC
Transducer Surface	MassaPlast™ 102 (custom PPA)
Cable	10 conductor, PVC jacket, 24 AWG, 10 ft. (3 m), User extendable to 1,500 ft. (457 m)
Operational Temperature	-20°C to 65°C
Storage Temperature	-40°C to 85°C
Relative Humidity	0 to 95%, non-condensing
Enclosure Rating	IP67
Programming Requirements	
Communication Converter	USB/RS-485 or RS-232/RS-485 with automatic send data control
Operating System	Windows® 10, 8, 7, Vista, and XP SP3

mPulse Series Model M-5000 Sensor Ordering Information

mPulse Series Model M-5000/220 Sensor, PN 300280-501

Includes: Locknuts P/N 7873-1 (Qty. 2), and

Optional Items: Serial Port Converters: USB/RS-485, P/N 8448-1 or RS-232(DB9)/RS-485, P/N 7868-1
Mounting Bracket P/N 200511-1

Massa Software & Manuals: Go to www.massa.com to download the latest versions

All Specifications Subject to Change Without Notice

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