



# PulStar® Series Sensors

Cost Effective | Non-Contact | Reliable | Distance Measurement

MassaSonic PulStar Series Sensors are ruggedly designed ultrasonic transmitter modules that provide reliable continuous level or distance measurement of fluids, pastes, or solid bulk materials for application ranges from 4 inches (100 mm) to 20 feet (6 meters). Incorporating state-of-the-art ultrasonic technology and processing algorithms, all PulStar models provide precision non-contact measurement for applications such as factory automation, process control or tank level monitoring.

PulStar Series Sensors include an advanced diagnostic feature that will retrieve the ultrasonic waveforms for analysis and display it on a computer to aid users when evaluating complex installations. They are RoHS compliant, CE Certified, and IP68 Rated. Three versions of the PulStar Sensor are available, PulStar, PulStar Plus, and PulStar TTL.

### PulStar (standard)

The lower cost standard models in the series are ideal if false echoes from sound reflecting structures between the sensor and the surface being measured are not encountered, and where extended detection ranges are not required.

### PulStar Plus

PulStar Plus Sensors include additional features, including drop down menus that automatically change detection settings to ignore false echoes caused by stationary objects in the sound path, such as mounting tubes. They also contain a High Power Setting for extended detection range.

*(The PulStar TTL Sensor is detailed in a separate Datasheet - see [www.massa.com](http://www.massa.com))*

PulStar Series Sensors have NPT mounting fittings and come in PVC or PVDF housings for use in different environments. All models are equipped with continuous temperature compensation to achieve precise measurement accuracy. Other user friendly features include: diagnostic and monitoring outputs, along with protection from over voltage, short circuits, and reverse polarity.

Operating from 12 to 24 VDC, PulStar Series Sensors provide user programmable linear outputs of 0 to 10 V DC, 4 to 20 mA, or 0 to 20 mA, which are proportional to the measured distance to the target. The output can also be set to operate as a digital switch within zones defined by specified target setpoint distances.

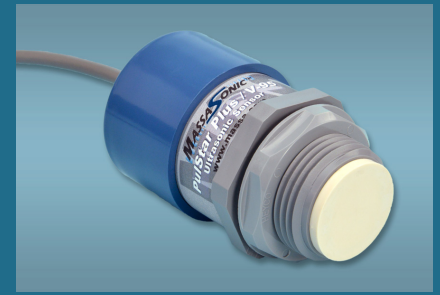
Compatible with MS Windows operating systems, and when using USB/RS-485 or RS-232/RS-485 converters, up to 32 sensors can be connected in parallel onto the same multi-drop communication network. This network also enables users to remotely program their sensors and read target distances for quick integration into control applications. All PulStar Sensors are adjustable for sampling rate, averaging measurement, analog output slope, loss-of-echo time-out, setpoint hysteresis, and provide a software sensor transmit trigger.

PulStar Series Sensors stand out over other sensors because of their user friendly set up, versatile control options, field proven reliability, and affordable cost of ownership.



GENERATIONS AHEAD IN SONAR & ULTRASONIC TECHNOLOGY

For more information, please visit [www.massa.com](http://www.massa.com), or contact one of our Applications Specialists at: [sales@massa.com](mailto:sales@massa.com)



PulStar Plus 95 kHz Sensor Depicted

## FEATURES

- Continuous or Switch Mode
- Plug & Play Setup
- Temperature Compensated
- Narrow Beam and Short Dead Band
- Up to 32 Sensors on RS-485 Multi-Drop Network
- Variety of Easy User Programmable Customizations
- Low Cost of Ownership (CoO)
- Tamperproof & Rugged
- IP68 Enclosure Rating
- Accurate Under Demanding Environmental Conditions

## APPLICATIONS

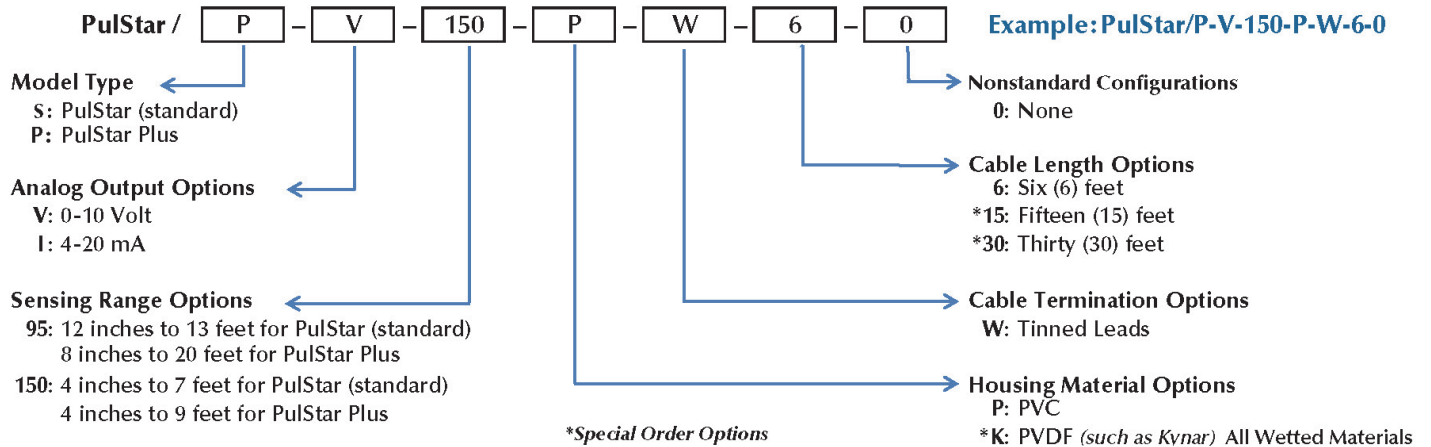
- Liquid & Solid Level Control
- Tanks, Totes, Processing
- Bulk Material Management
- Web Loop Monitoring
- Roll Diameter Measurement
- Automatic Packaging Operations
- Position Detection





## PulStar® Series Ordering Information

### PulStar Series Ordering Code



### Optional Items:

- Mounting Bracket: P/N 2000671-1
- Serial Port Converters: USB/RS-485, P/N 8448-1 or RS-232(DB9)/RS-485, P/N 7868-1
- Custom Tank Fitting PVC Adapter, 2 inches to 1 inch NPT: P/N 200758-1
- Massa Software & Manuals: Go to [www.massa.com](http://www.massa.com) to download the latest versions

## PulStar® Series Performance Specifications

(Typical 24 VDC, 22°C, and 50% RH Air)

Performance				
Target Detection Distances	Short Range (150 kHz)		Medium Range (95 kHz)	
	PulStar	PulStar Plus	PulStar	PulStar Plus
	4 inches (100 mm) to 7 feet (2.1 m)	4 inches (100 mm) to 9 feet (2.7 m)	12 inches (300 mm) to 13 feet (4 m)	8 inches (200 mm) to 20 feet (6 m)
Measurement Resolution	0.01 inches (0.25 mm)			
Measurement Accuracy	± 0.1% of Target Range			
Echo Detection Sensitivity	User Selectable			
System Beam Angle	8° Conical			
Response Time (after target determination)	60 mS			
Resolution	11 bit			
Temperature Compensation	Internal Probe			
Mechanical (See Outline Drawing)				
Housing Material	PVC or PVDF (See Ordering Information)			
Transducer Surface	MassaPlast 102 (custom PPA); or PVDF (See Ordering Information)			
Cable (For length and termination, see Ordering Information)	5 Conductor, 24 AWG, Shielded, PVC Jacket [User Extendable for RS-485 Communication to 5,000 feet (1,500 m)]			
Environmental				
Operational Temperature	-40°C to 70°C			
Storage Temperature	-40°C to 85°C			
Relative Humidity	0 to 95%, non-condensing			
Enclosure Rating	IP68			

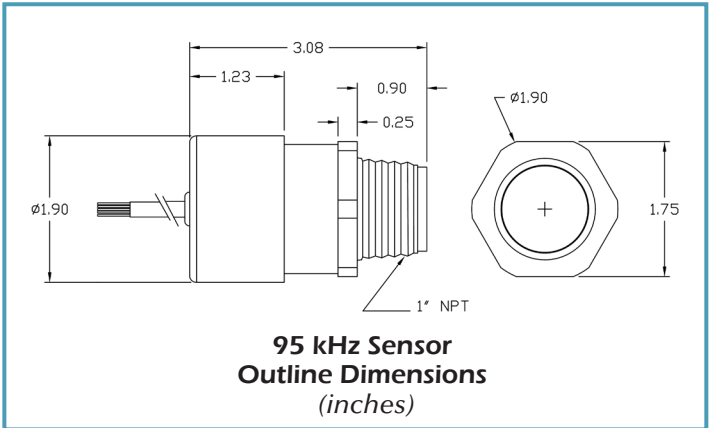
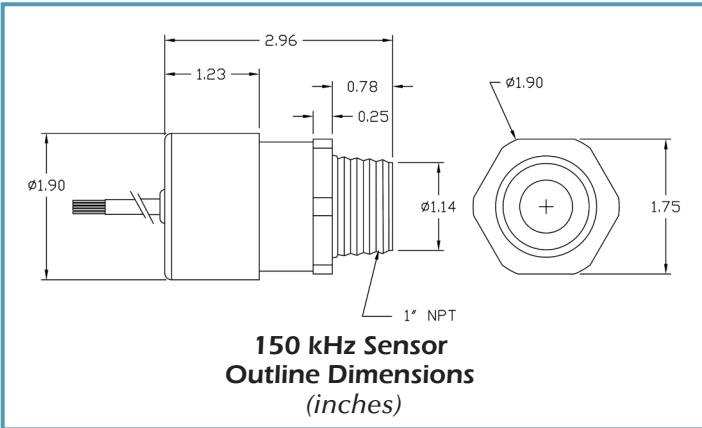
All Specifications Subject to Change Without Notice

[www.massa.com](http://www.massa.com)

## PulStar® Series User Interface Specifications

	All Voltage Output Models	All Current Output Models
<b>Programmable Outputs</b>	0-10 V DC	4 to 20 mA or 0 to 20 mA DC
<b>Power Required</b>	12 to 24 V DC (inverse polarity protected), 30 mA, typical	12 to 24 V DC (inverse polarity protected), 30 mA, typical (not including I-out)
<b>Setpoints</b> <i>(Programmable options in range min. to &gt; max. detection range.)</i>	0 or 10.25 V DC	0 or 20.5 mA DC
<b>Output Impedance</b>	100 ohms (both operational modes)	N/A
<b>Current Loop Output</b>	N/A	4 to 20 mA or 0 to 20 mA DC sourcing, invertible <i>Factory Default: 4 to 20.0 mA DC</i>
<b>Zero &amp; Span Voltage or Current</b>	Programmable from 0 to 10.25 V DC <i>Factory Default: 0 -10.0 V DC</i>	Programmable from 0 to 20.5 mA DC <i>Factory Default: 4 to 20.0 mA DC</i>
<b>Loss of Echo Voltage or Current</b>	Programmable from 0 to 10.25 V DC <i>Factory Default: 10.25 V DC</i>	Programmable from 0 to 20.5 mA DC <i>Factory Default: 20.5 mA DC</i>
<b>Zero &amp; Span Distance</b>	Each programmable over a range from min. distance to greater than max. distance <i>Factory Default:</i> <i>150 kHz: from 4 inches to 7 feet, and to 9 feet for Plus version</i> <i>95 kHz: from 4 inches to 13 feet, and to 20 feet for Plus version</i>	
<b>Trigger Modes</b>	Internal or Software Trigger	
<b>Target Distance Averaging</b>	Rolling Averages: from 1 to 32 samples, or Boxcar Average: from 1 to 1,024 samples <i>Factory Default: 1</i>	
<b>Loss of Echo Time-Out</b>	Programmable from 1 to 254 consecutive samples missed before time-out <i>Factory Default: 1</i>	
<b>Sampling Rate</b>	0.1 Hz to 20 Hz in 0.1 Hz increments <i>Factory Default: 10 Hz</i>	
<b>Communications Converter</b>	USB/RS-485 or RS-232/RS-485 with automatic send data control	
<b>Operating System</b>	Windows 10, 8, 7, Vista, and XP SP3	

**All PulStar Plus models additionally include an extended range high-power setting, and drop down menus to automatically ignore false echoes from certain types of stationary targets**



**PLEASE NOTE: PulStar Series Sensors can be used as direct “drop in” replacements for our Legacy M-300 and M-320 Sensors.**

