



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.

(The PulStar TTL Sensor is detailed in a separate Datasheet - see 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 V DC, PulStar Sensors provide user programmable linear outputs of 0 to 10 V DC or 4 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.

PulStar Plus

PulStar Plus Sensors include additional features, including drop down menus that allow changing 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.



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



GENERATIONS AHEAD IN SONAR & ULTRASONIC TECHNOLOGY

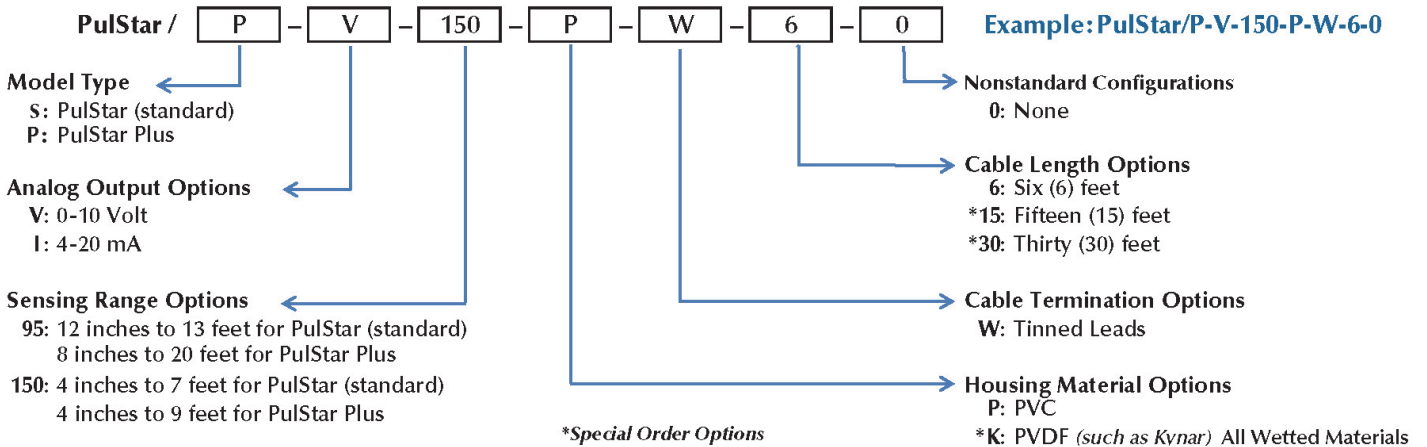
For more information, please visit www.massa.com, or contact one of our Applications Specialists at: www.massa.com/contact





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 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			

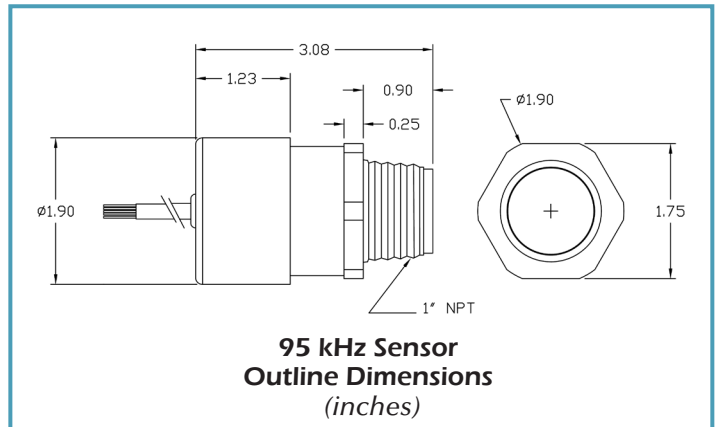
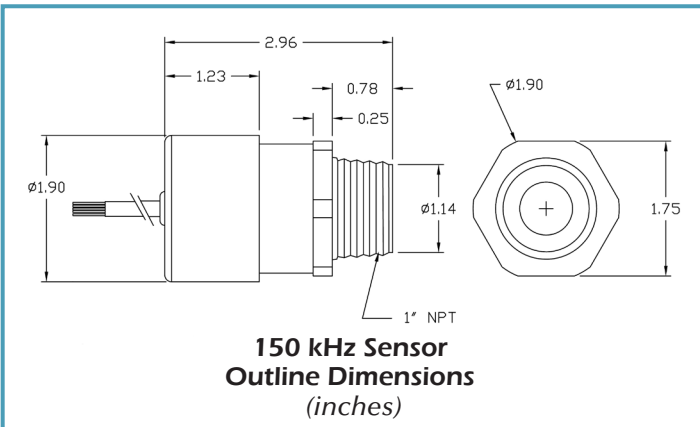
All Specifications Subject to Change Without Notice

www.massa.com

PulStar® Series User Interface Specifications

	All Voltage Output Models	All Current Output Models
Programmable Outputs	0-10 V DC	4 to 20 mA or 0 to 20 mA DC
Power Required	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)
Setpoints <i>(Programmable options in range min. to > max. detection range.)</i>	0 or 10.25 V DC	0 or 20.5 mA DC
Output Impedance	100 ohms (both operational modes)	N/A
Current Loop Output	N/A	4 to 20 mA or 0 to 20 mA DC sourcing, invertible <i>Factory Default: 4 to 20.0 mA DC</i>
Zero & Span Voltage or Current	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>
Loss of Echo Voltage or Current	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>
Zero & Span Distance	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 8 inches to 13 feet, and to 20 feet for Plus version</i>	
Trigger Modes	Internal or Software Trigger	
Target Distance Averaging	Rolling Averages: from 1 to 32 samples, or Boxcar Average: from 1 to 1,024 samples <i>Factory Default: 1</i>	
Loss of Echo Time-Out	Programmable from 1 to 254 consecutive samples missed before time-out <i>Factory Default: 1</i>	
Sampling Rate	0.1 Hz to 20 Hz in 0.1 Hz increments <i>Factory Default: 10 Hz</i>	
Communications Converter	USB/RS-485 or RS-232/RS-485 with automatic send data control	
Operating System	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



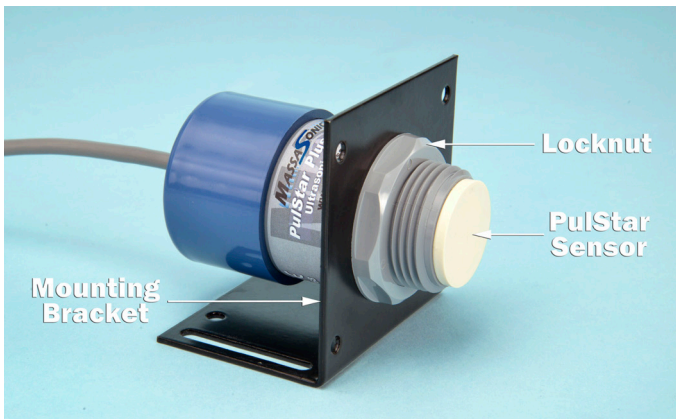
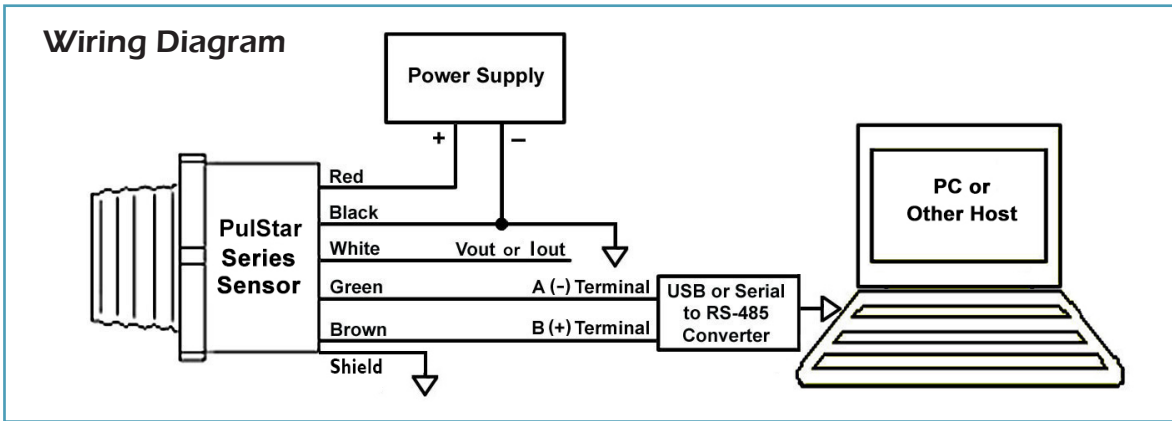
PLEASE NOTE: PulStar Series Sensors can be used as direct “drop in” replacements for our Legacy M-300 and M-320 Sensors.



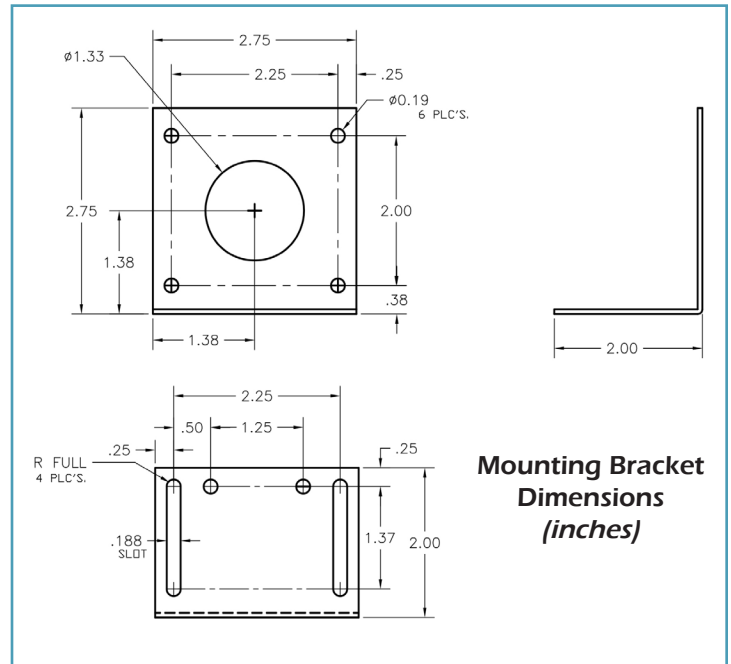
PulStar® Series Wiring and Mounting Information

To operate MassaSonic™ PulStar Series Sensors, it is only necessary to connect its red and black wires to a DC battery or power supply as shown in the diagram below. The white wire will then indicate the distance to the target or its position relative to the setpoint.

To change the programmable parameters, or to observe the target distance digitally with the user-friendly software, the sensor can be connected to a computer or other host system with either an optionally supplied USB/RS-485 or RS-232/RS-485 converter. Before more than one PulStar Series Sensor can be used simultaneously on the same RS-485 Communication Bus, each sensor must first be programmed with its own unique ID Tag. After this has been completed, the green and brown communication wires for all of the PulStar Series Sensors should be connected in parallel. Terminating resistors are not required for the RS-485 Network.



PulStar Plus 95 kHz Sensor on a Mounting Bracket Depicted



Mounting Bracket Dimensions (inches)



GENERATIONS AHEAD IN SONAR & ULTRASONIC TECHNOLOGY

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For more information, please visit www.massa.com, or contact one of our Applications Specialists at: www.massa.com/contact