Imagine a sensor mounted inside a cylinder that never wears out and withstands severe vibration and shock.

Imagine a sensor that enables GPS guided steering, hydraulic ride control, all wheel steering, bucket and boom self-leveling, and rough field contour control.

Imagine a sensor that enables a closed-loop feedback control system to improve system performance, productivity, machine life and safety.

ABSOLUTE POSITION SENSORS FOR CLOSED LOOP ELECTRO-HYDRAULIC APPLICATIONS

Today's mobile machines demand better safety systems, greater reliability, single-hand control, absolute positioning, noise reduction, increased productivity, reduced shock and stress on mechanical parts - all with lower development costs. The answer is Temposonics. Our sensors enable mobile machine designers to lock in the advantages of closed loop feedback for electro-hydraulic systems.

MTS mobile machine sensors lower overall costs by increasing safety, versatility and reliability while reducing service and maintenance costs. Here's something to think about. Other sensor technologies can require frequent re-calibration, especially when power is interrupted. Not MTS sensors. Once a Temposonics sensor is initially calibrated it's set for good. This prevents downtime and reduces service calls. It's this simple. Design MTS sensors into your mobile machines and take the first step towards lowering the cost of ownership for your end customers.

MTS sensors has developed Temposonics sensors specifically for mobile machine applications, including steer-by-wire, all-wheel steering, absolute cylinder position, bucket position, self-leveling, load leveling, GPS guided programmable depth control, ride control, and valve spool position control.

With MTS mobile machines sensors, you get superior technology, expertise and the support of a global manufacturer with a unique understanding of your industry. We offer application support, on-site design support, outstanding service before and after the sale, testing assistance, training and troubleshooting. Contact us to discuss how we can make your next big idea a reality.

Part Number: 02-08 551115 Revision A

MTS SENSORS

UNITED STATES
MTS Systems Corporation
Sensors Division
3001 Sheldon Drive
Cary, NC 27513
Tel: (800) 633-7609
Fax: (919) 677-0200
(800) 498-4442
www.mtssensors.com
sensorsinfo@mts.com

GERMANY
MTS Sensor Technologie
GmbH & Co. KG
Auf dem Schüffel 9
D - 58513 Lüdenscheid
Tel: +49 / 23 51 / 95 87-0
Fax: +49 / 23 51 / 56 491
www.mtssensor.de
info@mtssensor.de

JAPAN
MTS Sensors Technology
Corporation
Ushikubo Bldg.
737 Aihara-cho, Machida-shi
Tokyo 194-0211, Japan
Tel: +81 (42) 775 / 3838
Fax: +81 (42) 775 / 5516
www.mtssensor.co.jp
info@mtssensor.co.jp

Temposonics®

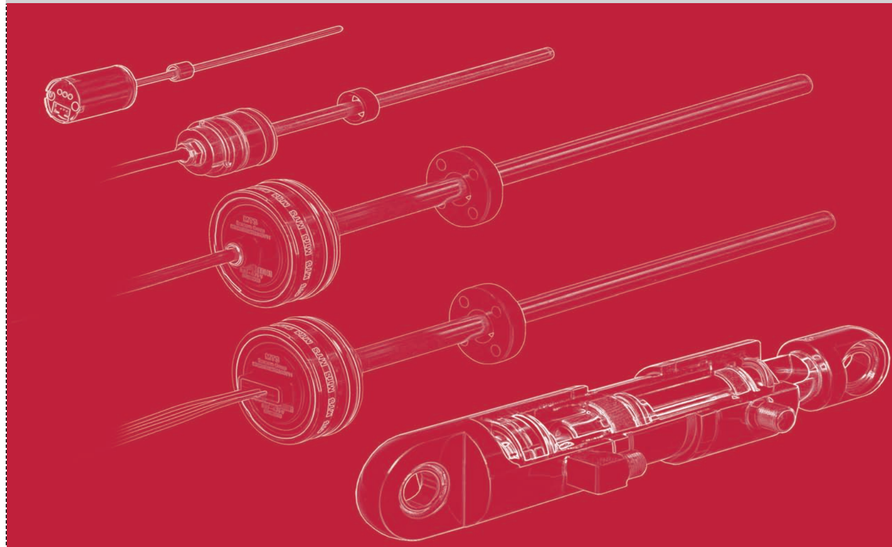
Magnetostrictive Linear-Position Sensors

Mobile Equipment Sensors

MTS SENSORS

551115 A

Product Selector Guide



MTS Systems Corp. Minneapolis, USA

MTS Sensors Division, Cary, North Carolina, USA

MTS Sensor Technologie, Lüdenscheid, Germany

MTS Sensors Technology Corp, Tokyo, Japan

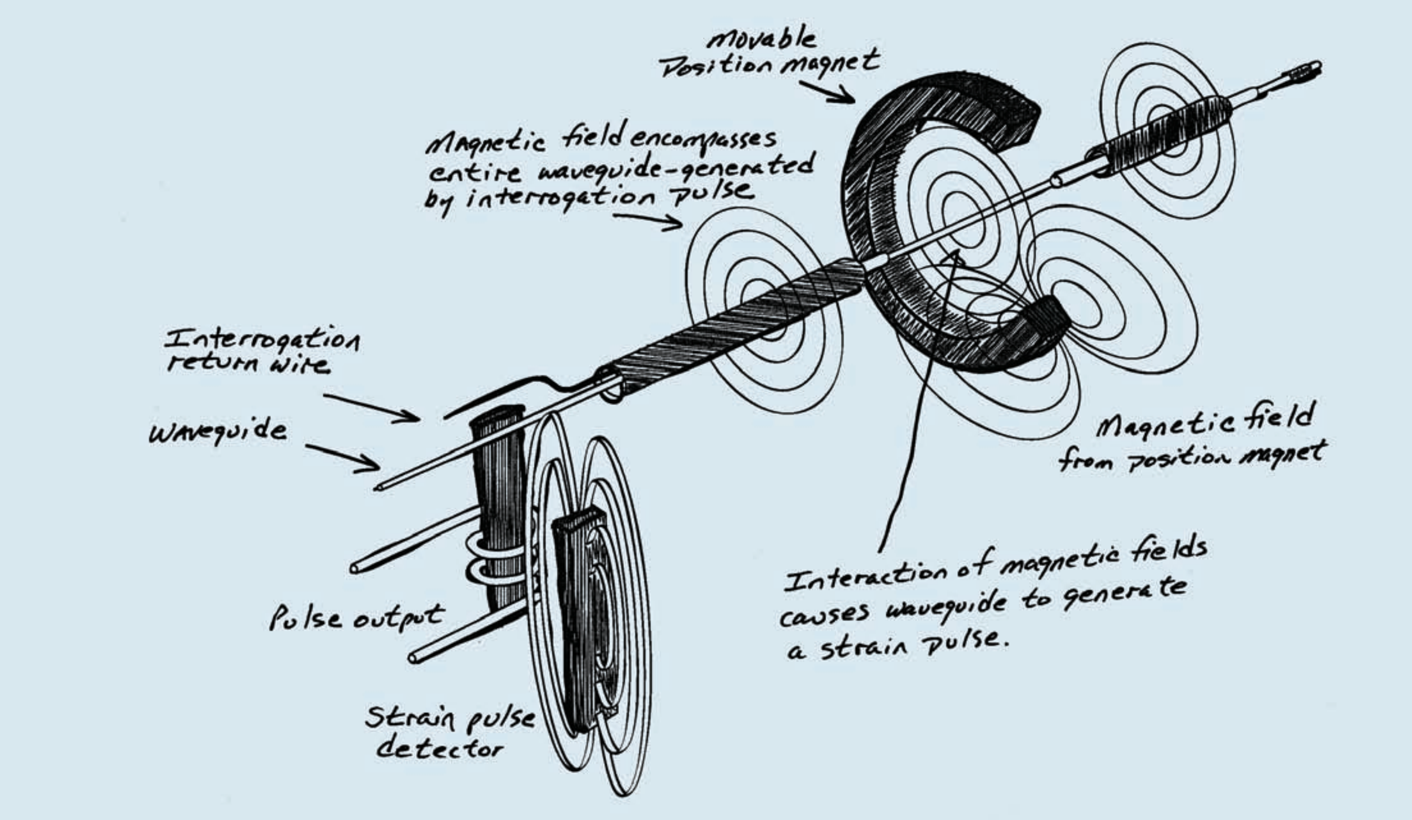
MTS Sensors applies Temposonics magnetostrictive sensing technology to linear position and liquid-level measurement across a wide variety of industrial and commercial applications. Since our invention of magnetostrictive sensing three decades ago, we've expanded the capabilities of this technology, extended the reach of its design advantages, and improved its performance benefits.

Applications are almost limitless. Because our sensors are non-contacting and non-wearing, there isn't a more accurate, reliable sensor anywhere. Our customers install our sensors and enjoy trouble-free operation for years without the need for adjustment or recalibration. Our innovative manufacturing processes, combined with world-class engineering, enable us to provide this technology to you at the lowest cost of ownership.

Backing the quality of our design, the flexibility of our technology and our superior manufacturing are MTS people. Our engineers, manufacturing specialists, and quality control experts make MTS a company you can rely on to get it done right, on time, and to specification. Our people make MTS the best sensor option for your next development project.

Magnetostriction

Temposonics linear-position sensors use the time-based magnetostrictive position sensing principle developed by MTS. Within the sensing element, a sonic strain pulse is induced in a specially designed magnetostrictive waveguide by the momentary interaction of two magnetic fields. One field comes from a movable permanent magnet that passes along the outside of the sensor. The other field comes from an "interrogation" current pulse applied along the waveguide. The resulting strain pulse travels at ultrasonic speed along the waveguide and is detected at the head of the sensing element. The position of the magnet is determined with high precision and speed by accurately measuring the elapsed time between the application of the interrogation pulse and the arrival of the resulting strain pulse with a high speed counter. Using the elapsed time to determine position of the permanent magnet provides an absolute position reading that never needs recalibration or re-homing after a power loss. Non-contact sensing eliminates wear, and guarantees the best durability and output repeatability.



	M-Series					C-Series
						
Model	**Model MH Analog**	**Model MH Digital**	**Model MH CANbus**	**Model MS Analog Small Profile Sensor**	**Model MT Analog Electrically Redundant Sensor**	**CM Sensor with IP67 Housing CM Core Sensor**
Output	**Voltage:** 0.25 to 4.75 Vdc, 0.5 to 4.5 Vdc (Reverse: 4.75 to 0.25 Vdc, 4.5 to 0.5 Vdc) **Current:** 4 to 20 mA, 0 to 20 mA (Reverse: 20 to 4 mA, 20 to 0 mA)	**Scaled PWM:** Scaling: 5% - 95%, 10% - 90%, 15% - 85%, 20% to 80%, 25% - 75% Frequency (Hz): 50, 60, 100, 200, 300, 400, 500	**Protocol Output:** CANbus J1939 CANOpen ISOBUS	**Voltage:** 0.25 to 4.75 Vdc, 0.5 to 4.5 Vdc (Reverse: 4.75 to 0.25 Vdc, 4.5 to 0.5 Vdc) **Current:** 4 to 20 mA, 0 to 20 mA (Reverse: 20 to 4 mA, 20 to 0 mA)	**Voltage:** 0.25 to 4.75 Vdc, 0.5 to 4.5 Vdc (Reverse: 4.75 to 0.25 Vdc, 4.5 to 0.5 Vdc) **Current:** 4 to 20 mA, 0 to 20 mA (Reverse: 20 to 4 mA, 20 to 0 mA)	**Voltage:** 0.1 to 4.9 Vdc
	Position measurement	Position measurement	Position and velocity measurement	Position Measurement	Position measurement	Position measurement
Measuring range	50 mm (2 in.) to 2500 mm (98 in.)	50 mm (2 in.) to 2000 mm (79 in.)	50 mm (2 in.) to 2000 mm (79 in.)	50 mm (2 in.) to 2000 mm (79 in.)	50 mm (2 in.) to 1500 mm (59 in.)	72 mm (2.85 in.) to 250 mm (9.85 in.)
Linearity	< ±0.04% F.S.	< ±0.04% F.S.	< ±0.04% F.S.	< ±0.04% F.S.	< ±0.04% F.S.	± 0.15 mm
Resolution	Infinite	0.05 mm	0.1 mm	Infinite	Infinite	Infinite
Repeat-ability	< ±0.005% F.S.	< ±0.005% F.S.	< ±0.005% F.S.	< ±0.005% F.S.	< ±0.005% F.S.	± 25 microns
Vibration rating	10 mm (0.39 in.) pipe: 25 g RMS/ 10 to 2000 Hz/ IEC 68-2-6 7 mm (0.28 in.) pipe: 15 g RMS/ 10 to 2000 Hz/ IEC 68-2-8	10 mm (0.39 in.) pipe: 25 g RMS/ 10 to 2000 Hz/ IEC 68-2-6 7 mm (0.28 in.) pipe: 15 g RMS/ 10 to 2000 Hz/ IEC 68-2-8	10 mm (0.39 in.) pipe: 25 g RMS/ 10 to 2000 Hz/ IEC 68-2-6 7 mm (0.28 in.) pipe: 15 g RMS/ 10 to 2000 Hz/ IEC 68-2-8	7 mm (0.28 in.) pipe: 15 g RMS/ 10 to 2000 Hz/ IEC 68-2-8	10 mm (0.39 in.) pipe: 10 g RMS/ 10 to 2000 Hz/ IEC 68-2-6	5 g RMS/ 10 to 2000 Hz/ IEC68.2.6
Shock rat-ing	100 g (single hit) /IEC 68-2-27	100 g (single hit) /IEC 68-2-27	100 g (single hit) /IEC 68-2-27	100 g (single hit) /IEC 68-2-27	100 g (single hit) /IEC 68-2-27	100 g (single hit) /IEC 68-2-27
Pressure rating	10 mm (0.39 in.) pipe: Operating: 350 bar (5076 psi) Peak: 530 bar (7687 psi) 7 mm (0.28 in.) pipe: Operating: 300 bar (4351 psi) Peak: 450 bar (6526 psi)	10 mm (0.39 in.) pipe: Operating: 350 bar (5076 psi) Peak: 530 bar (7687 psi) 7 mm (0.28 in.) pipe: Operating: 300 bar (4351 psi) Peak: 450 bar (6526 psi)	10 mm (0.39 in.) pipe: Operating: 350 bar (5076 psi) Peak: 530 bar (7687 psi) 7 mm (0.28 in.) pipe: Operating: 300 bar (4351 psi) Peak: 450 bar (6526 psi)	7 mm (0.28 in.) pipe: Operating: 300 bar (4351 psi) Peak: 450 bar (6526 psi)	10 mm (0.39 in.) pipe: Operating: 350 bar (5076 psi) Peak: 530 bar (7687 psi)	Peak: 24 bar (353 psi) (with Housing)
Operating temperature	-40 °C (-40 °F) to 105 °C (221 °F)	-40 °C (-40 °F) to 105 °C (221 °F)	-40 °C (-40 °F) to 105 °C (221 °F)	-40 °C (-40 °F) to 105 °C (221 °F)	-40 °C (-40 °F) to 105 °C (221 °F)	-40 °C (-40 °F) to 85 °C (185 °F) Consult factory for higher temperatures.
Sealing	IP 67	IP 67	IP 67	IP 67	IP 67	IP 40 (IP67 with Housing)
EMC	200 V/m: ISO 11452-5, ISO 14982, Agriculture and forest machines ISO 7637-0/1/2/3, Road vehicles DIN EN 50121-3-2:5/2001, Railway applications IEC 61000-6-1/2 - CE	200 V/m: ISO 11452-5, ISO 14982, Agriculture and forest machines IEC 61000-6-1/2 - CE	200 V/m: ISO 11452-5, ISO 14982, Agriculture and forest machines IEC 61000-6-1/2 - CE	200 V/m: ISO 11452-5, ISO 14982, Agriculture and forest machines IEC 61000-6-1/2 - CE	100 V/m: ISO 11452-5, ISO 14982, Agriculture and forest machines IEC 61000-6-1/2 - CE	100 V/m: ISO 11452-5, IEC 61000-6-1/2 - CE
Electrical ratings	Operating voltage: 12/24 Vdc Operating range: 10 to 36 V Current drain: 80 mA typical Electrical isolation: 500 Vdc (DC ground to machine ground) Polarity protection: -36 Vdc Overvoltage protection: 36 Vdc	Operating voltage: 12/24 Vdc Operating range: 10 to 36 V Current drain: 80 mA typical Electrical isolation: 500 Vdc (DC ground to machine ground) Polarity protection: -36 Vdc Overvoltage protection: 36 Vdc	Operating voltage: 12/24 Vdc Operating range: 10 to 36 V Current drain: 80 mA typical Electrical isolation: 500 Vdc (DC ground to machine ground) Polarity protection: -36 Vdc Overvoltage protection: 36 Vdc	Operating voltage: 12 Vdc Operating range: 10 to 36 V Current drain: 80 mA typical Electrical isolation: 500 Vdc (DC ground to machine ground) Polarity protection: -36 Vdc Overvoltage protection: 36 Vdc	Operating voltage: 12 Vdc Operating range: 10 to 36 V Current drain: 80 mA typical Electrical isolation: 500 Vdc (DC ground to machine ground) Polarity protection: -36 Vdc Overvoltage protection: 36 Vdc	Operating voltage: 12 Vdc Operating range: 12 ± 25%