

**IMPORTANT - Read this before you begin programming!**

All Temposonics III position sensors are factory calibrated and should not require calibration. However, if your application requires that the zero and span settings output be modified, use the appropriate procedure below.

Velocity output changes must be made at the factory; they are not field-programmable.

**CAUTION:**

When programming Temposonics III sensors, make sure that the setpoints are within the active stroke length of the sensor.

**Tools Needed:**

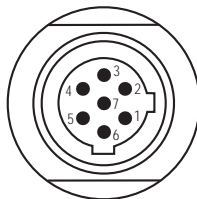
Flathead Screwdriver - to remove screws that access pushbuttons.

Jeweler's Screwdriver or equivalent - for depressing pushbuttons.

24 Volt Power Supply - to power the sensor.

**RG Connector:**

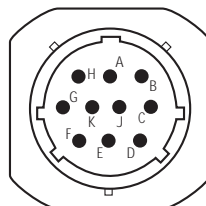
Pin No.	Wire Color	Function
1	Gray	Output #1 (Displacement) * 0 to 10 Vdc, 10 to 0 Vdc, 4 to 20 mA, 0 to 20 mA, 20 to 4 mA, or 20 to 0 mA
2	Pink	Return for Pin 1
3	Yellow	Output #2 (Displacement or Velocity) * 0 to 10 Vdc, 10 to 0 Vdc, 4 to 20 mA, 0 to 20 mA, 20 to 4 mA, or 20 to 0 mA
4	Green	Return for Pin 3
5	Red or Brown	+ 24 Vdc, Customer Supplied
6	White	DC Ground
7	-	No Connection



RG Connector

**MS Connector:**

Pin No.	Wire Color	Function
A	White	DC Ground
B	-	No Connection
C	Gray	Return for Pin D
D	Pink	Output #1 (Displacement) * 0 to 10 Vdc, 10 to 0 Vdc, 4 to 20 mA, 0 to 20 mA, 20 to 4 mA, or 20 to 0 mA
E	Red	+ 24 Vdc, Customer Supplied
F	-	No Connection
G	Yellow	Output #2 (Displacement or Velocity) * 0 to 10 Vdc, 10 to 0 Vdc, 4 to 20 mA, 20 to 4 mA, 0 to 20 mA, or 20 to 0 mA
H	Green	Return for Pin G
J	-	No Connection
K	-	No Connection



MS Connector

(Mating Connector: P/N 370013; MS3116F-12-10S)

**R0 Cable Integral Cable:**

Wire Color	Function
Gray	Output #1 (Displacement) * 0 to 10 Vdc, 10 to 0 Vdc, 4 to 20 mA, 0 to 20 mA, 20 to 4 mA, or 20 to 0 mA
Pink	Displacement Output Return for Gray Wire
Yellow	Output #2 (Displacement or Velocity) * 0 to 10 Vdc, 10 to 0 Vdc, 4 to 20 mA, 20 to 4 mA, 0 to 20 mA, or 20 to 0 mA
Green	Displacement Output Return for Yellow Wire
Red or Brown	+ 24 Vdc, Customer Supplied
White	DC Ground

**Recommended Load Resistance:**

For Vdc output: >5K ohm

For mA output: ≤400 ohm

\* When using dual outputs, outputs #1 and #2 must have the same output scale (i.e., voltage or current) and the same orientation (i.e., forward or reverse acting).

## SECTION A - MODE SELECTION

- 1.) Move the magnet to the end of the active stroke (see figure 2).
- 2.) Connect a voltmeter (for voltage outputs) or an ammeter (for current outputs) across output 1.

### NOTE:

*Tempsonics III sensors are supplied with either Vdc or mA output from the factory and cannot be reprogrammed in the field.*

- 3.) Apply power to the sensor
- 4.) Using a jeweler's screwdriver, press and hold pushbutton 1 for approximately 2 seconds (PB1, see Fig. 1 for pushbutton locations) until the output goes to approximately 5.5 volts (11.5 mA). This indicates the *Single Magnet Programming Mode*. Release PB1.

### CAUTION:

*Pushbuttons are delicate. Excessive force is not required, damage may result.*

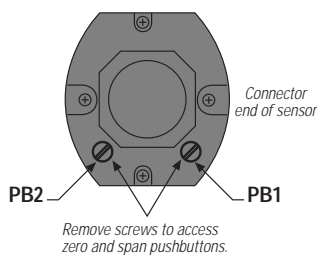
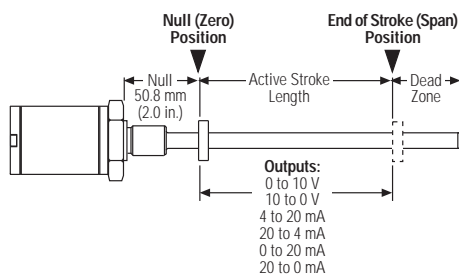


Figure 1



#### Stroke-dependent Dead Zones (Tempsonics RH)

Stroke Length	Dead Zone
1 - 4500 mm (1 - 177 in.)	63.5 mm (2.5 in.)
4501 - 7625 mm (177.1 - 300 in.)	66 mm (2.6 in.)

Figure 2

- 5.) Press and release PB1 to scroll through the two available field programming modes:

*(The voltage and current values indicated below are approximate values and may vary slightly.)*

- **Mode #1 (Single Magnet Mode):** approximately 5.5 V (11.5 mA)
- **Mode #2 (Dual Magnet Mode):** approximately 3.0 V (6.8 mA)
- **Mode #3 [8.0 V (15.5 mA)] is for factory use - DO NOT USE**

- 6.) Press and release PB2 to confirm mode. The output will go to approximately 10 V (20 mA).

## SECTION B - MODE #1: ZERO & SPAN ADJUSTMENT FOR SINGLE MAGNET (POSITION)

- 1.) Press and release PB1 to select either zero or full scale. Repeatedly pressing PB1 will alternate the output between approximately 10 V and 0 volt (20 mA and 2.2 mA).
- 2.) Press and release PB2 to confirm zero or scale. The output will go to either zero (0 V or 4 mA) or full scale (10 V or 20 mA), depending on the selection in Step 1.
- 3.) Use PB1 or PB2 to adjust output to desired setting. DO NOT adjust output below 0.050 V or 0.050 mA.

### NOTES:

*Zero and Span outputs can be adjusted. Zero should be programmed between 0.050 and 0.060 Vdc (DO NOT adjust below 0.050 Vdc or 0.050 mA). Span should be programmed at  $\pm 0.020$  Vdc of the desired level.*

*Pressing PB1 will increase the reading and pressing PB2 will decrease the reading. Pressing and holding the PBs for several seconds may cause the system to overshoot the desired set point voltage. Jogging the PB may be necessary to obtain the desired setting.*

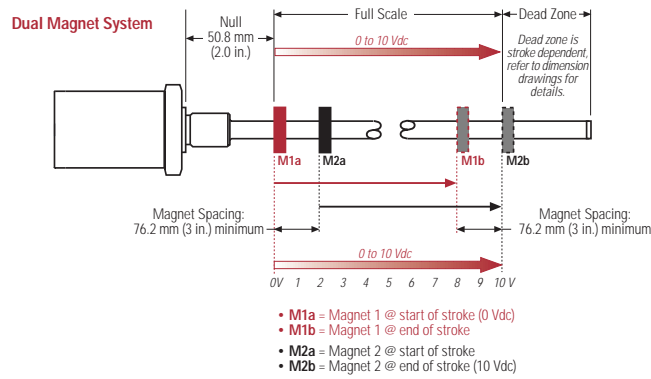
- 4.) To enter the next set point, simply move the magnet towards the head of the sensor (i.e., the start of the active range of the sensor). The output will jump to the other end of the output range (i.e., if 10 V or 20 mA was selected in Step 3, the output will go to approximately 0 V or 4 mA).
- 5.) After the magnet is moved to the desired starting position, use PB1 or PB2 to adjust the starting point to the desired output value.
- 6.) To confirm the starting set point, simply move the magnet towards the first set point. Moving the magnet automatically exits programming and puts the sensor in operating mode.

**Single magnet displacement programming is complete.**

## SECTION C - MODE #2: ZERO & SPAN ADJUSTMENT FOR DUAL MAGNET PROGRAMMING

### CAUTION:

When using a dual magnet system, there must be a minimum distance of 3 inches between the two magnets at all points along the stroke length of the sensor.



In the following procedure, Magnet #1 is the magnet closest to the head of the sensor.

#### • Programming Magnet #2

- 1.) Place Magnet #2 (M2b) at full stroke. Place Magnet #1 (M1a) at the beginning of the active stroke. Connect a voltmeter across output 2 (yellow & green wires) or an ammeter in series across output 2 (yellow wire).
- 2.) Follow Steps 1 - 6 (Section B).
- 3.) Return Magnet #2 (M2b) to end of active stroke. Note the voltage should remain at approximately 1.5 V.

#### • Programming Magnet #1

- 1.) Place Magnet #1 (M1b) at the end of its active stroke (away from the head of the sensor). Connect a voltmeter or ammeter across output 1 (gray and pink).
- 2.) After moving Magnet #1 into the desired position, follow steps 1 - 6 of Section B.

***Dual magnet displacement programming is now complete.***



**MTS Systems Corporation**

Sensors Division  
3001 Sheldon Drive  
Cary, NC 27513  
Phone: 800-633-7609  
Fax: 919-677-0200  
Internet: [www.temposonics.com](http://www.temposonics.com)

**MTS Sensor Technologie GmbH and Co. KG**

Auf dem Schüffel 9, D-58513 Lüdenscheid, Germany  
Postfach 8130 D-58489 Lüdenscheid, Germany  
Phone: +49-2351-95870  
Fax: +49-2351-56491

**MTS Sensors Technology Corporation**

Izumikan Gobancho  
12-11 Gobancho, Chiyoda-ku  
Tokyo 102 Japan  
Phone: + 03 3239-3003  
Fax: + 03 3262-7780

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All Temposonics position sensors are covered by US patent number 5,545,984. Other patents pending.  
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