MEAS M5600

Wireless Pressure Transducer

- 316L or 17-4PH Stainless Steel Wetted Surfaces
- Bluetooth 4.2 Wireless Communication
- Pairing Mode or Advertising (Beaconing) Mode
- 32-Bit Digital Pressure Data Output
- 16-Bit Digital Temperature Data Output
- Weatherproof IP65 Rating
- Variety of Pressure Ports
- CR2032/CR2050W Battery Compatible

FEATURES

- Heavy Industrial CE Approved
- ±0.25% Pressure Non-Linearity
- ±1.0% Total Error Band (TEB)
- -10 to 60°C Compensated Temperature
- Operating Temperature (Battery):
  - -20 to 60°C (Panasonic/Energizer CR2032)
  - -20 to 70°C (Sony/MuRata CR2032)
  - -20 to 85°C (Murata CR2050W)
- Withstands 50g shock and maximal 10g Vibration
- Excellent Long-term Stability

APPLICATIONS

- Gas and Liquid Flow Measurements
- Tank Liquid Level Measurements
- Liquid and Gas Filter Monitoring
- Corrosive Gases and Liquids
- Remote and Hard to Reach Locations
- Factory Process Control
- Energy Generation and Management

The M5600 series from TE Connectivity's Sensors Business Unit sets the price and performance standard for wireless pressure transducers used in demanding industrial and smart factory applications.

The modular M5600 wireless pressure transducer from our Microfused line is enclosed in a stainless steel and PBT housing. This high accuracy, 24-bit ADC digital output wireless transducer eliminates hard wiring and provides remote process control and monitoring via Bluetooth® 4.2 Wireless Communication. This series is suitable for measurement of liquid or gas pressure, even for difficult media such as contaminated water, steam, and mildly corrosive fluids.

The wetted surfaces of the pressure ports are made from 316L or 17-4PH stainless steel. The port design uses no internal O-rings or organics exposed to the pressure media which provides excellent durability and long-term performance.

The M5601 is FM certified for Intrinsic Safety:
IS Class I, Div1, Groups A, B, C, and D;
Class I Zone 0, AEx ia IIC T4 Ga;
Ex ia IIC T4 Ga;
ll 1 G Ex ia IIC T4 Ga

FCC, ISED and RED compliant

STANDARD RANGES

Range (psi)	Range (Bar)	Gage	Sealed	Compound
0 to 050	0 to 3.5	•		•
0 to 100	0 to 007	•		•
0 to 200	0 to 014	•		•
0 to 300	0 to 020	•		•
0 to 500	0 to 035	•		•
0 to 01k	0 to 070	•	•	•
0 to 03k	0 to 200	•	•	•
0 to 05k	0 to 350	•	•	•
0 to 10k	0 to 700	•	•	•
0 to 15k	0 to 01k	•	•	•

Intermediate ranges available upon request.

PERFORMANCE SPECIFICATIONS

Ambient Temperature: 25°C (unless otherwise specified) For custom configurations, consult factory.

Parameters	Min	Typ	Max	Units	Notes
Supply Voltage	2.3	3	3.6	V_{DC}	Replaceable CR2032/CR2050 battery
Accuracy	-0.25		0.25	%F.S.	RSS of linearity, hysteresis, and repeatability
Resolution		0.00005		%F.S.	
Output Protocol		Digital I²C			
A/D Resolution		24		Bit	
Operating frequency		2.4		GHz	
Cycle life	1.00E+6			0~FS Cycles	
Stability	-0.25		0.25	%F.S./year	
Total Error Band	-1		1	%F.S.	@25°C over compensated range
Proof Pressure	2X		20k psi	Rated	
Burst Pressure	5X		20k psi	Rated	
Compensated Temperature	-10		+60	°C	
Operating Temperature	-20		+60	°C	CR2032 (Panasonic/Energizer)
	-20		+70	°C	CR2032 (Sony/MuRata)
	-20		+85	°C	CR2050W (MuRata)
Storage Temperature	-40		+120	°C	without battery
Wireless Protocol	BLE4.2				
Receiver Operating System	Android™ 4.3 or above, iOS 7 or above, Windows® XP/7 or above				
Signal Pairing Distance	65 feet				
Signal Transmission Distance	65 feet affected by receiver antenna and blocking objects				
Battery Life	1-year typical CR2032 210mAH battery; 1 minute transmission interval. 2-years typical CR2050W 350mAH battery, 1 minute transmission interval.				
Low Battery Warning	2.5V_{DC}, red battery symbol in app				
Weatherproof	IP65				
Pressure Port Material	316L or 17-4PH Stainless Steel Port, 316L Stainless Steel Snubber				
Enclosure	Stainless Steel and PBT				
Shock	50g, 11msec Half Sine Shock per MIL-STD-202G, Method 213B, Condition A				
Vibration	10Hz to 55Hz, double amplitude 1.52mm, EIA-364-28F, Condition I				

Note:
Battery life depends on its capacity, operating temperature and signal transmission interval.
Temperature can impact battery capacity retention even in idle. Check battery specifications for more details.
Factory default data transmission rate is 5sec, which can be adjusted from 100msec to 5sec in smartphone app or PC software.

COMPLIANCE

EN 55032 Emissions Class A & B

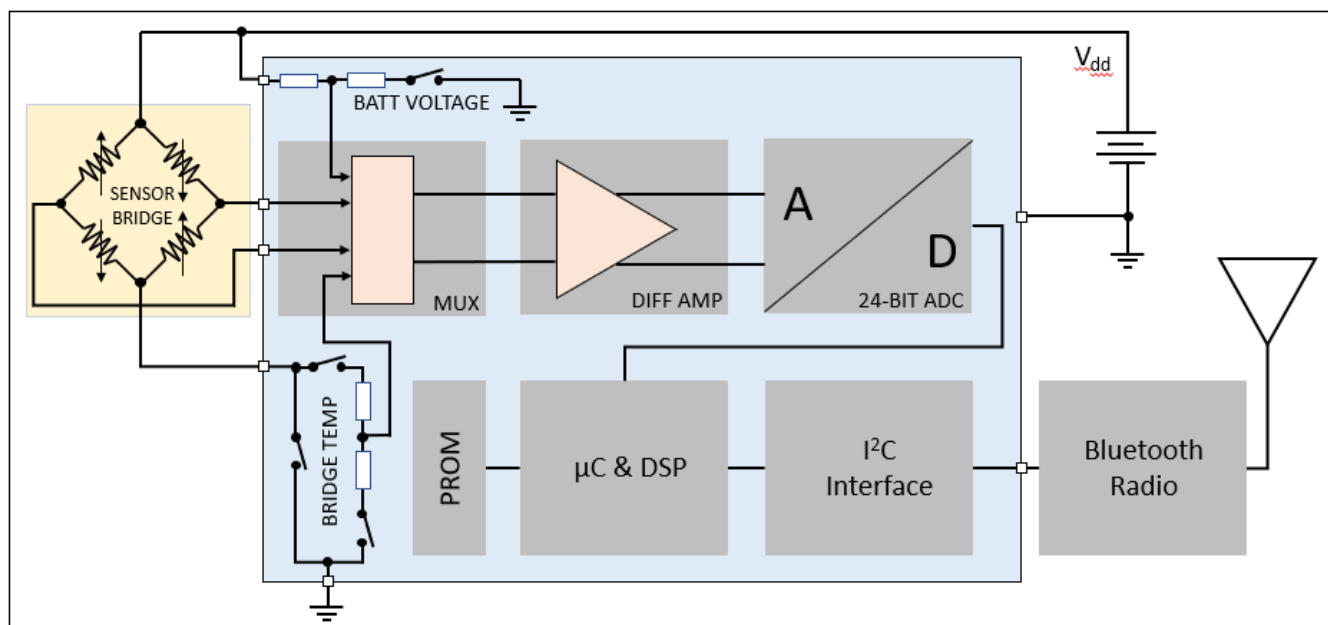IEC 61000-4-2 Electrostatic Discharge Immunity (4kV contact/8kV air)

IEC 61000-4-3 Radiated, Radio-Frequency Electromagnetic Field Immunity (10V/m, 80M-1GHz); Shift <1.5%

FCC Part 15 Subpart B Unintentional Radiators (US)

ICES-003 Unintentional Radiators (Canada)

RED ETSI EN 301 489-1 V2.1.1 & ETSI 301 480-17 V3.2.1 (Europe)

BLOCK DIAGRAM

Specific conditions of use

1. The non-metallic parts incorporated in the enclosure may generate an ignition-capable level of electrostatic charge. Upon installation, care shall be taken to avoid locations where the external conditions are conductive to the build-up of electrostatic charge on such surfaces. Additionally, the equipment shall only be cleaned with a damp cloth.

2. The Bluetooth Pressure Transducers do not have an earth ground terminal. The transducers shall be earth grounded as part of the final installation.

3. The Model M5601-xxx1xx-xx and Model U5601-xxx1xx-xx Pressure Transducer shall use only the CR2032 Panasonic or Energizer cell. The ambient range is Ta = -20°C to +60°C.

4. The Model M5601-xxx2xx-xx and Model U5601-xxx2xx-xx Pressure Transducer shall use only the CR2032 Sony/Murata cell. The ambient range is Ta = -20°C to +70°C.

5. The Model M5601-xxx3xx-xx and Model U5601-xxx3xx-xx Pressure Transducer shall use only the CR2050W Murata cell. The ambient range is Ta = -20°C to +85°C.

## HOW TO OPERATE

Please refer to the M5600_U5600 Installation Manual and M5600_U5600 Software Manual.

COMMUNICATION PROTOCOLS

Pairing mode (Model M560x – xx0):

- The device is set up to be both discoverable and connectable.
- The device is constantly listening for a signal from any other Bluetooth device within range that might send out an inquiry for connection (connection request).
- Once a signal is received and acknowledged, a single two-way communication channel is established, and the two devices will only communicate with each other or be paired.
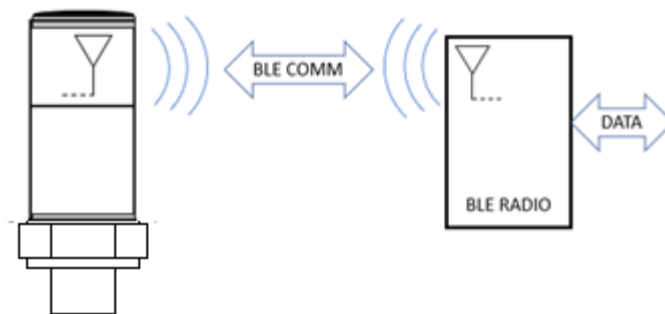

Advertising (Beaconing) mode (Model M560x – xx1):

- When power is first applied (insert battery), the device enters the configuration mode (six hours long) which facilitate pairing so updates and software changes can be made. The device is set up to be discoverable but connectable for configuration.
- Six hours after the last pairing, the transducer will switch to low power advertising mode and begin transmitting data. The device is constantly transmitting data (advertising) at higher intervals to save battery. Any other Bluetooth device within range can receive the data and may establish a two-way connection for configuration.
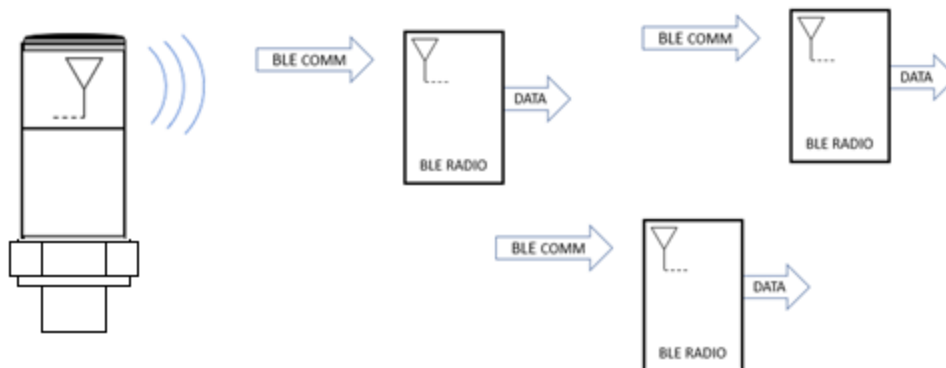
DIMENSIONS
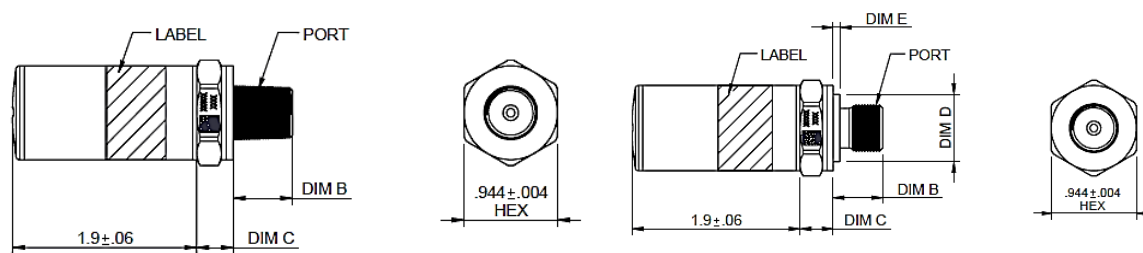
* FOR PRESSURE PORT CODE:5,6,E,F,P,N,W

* FOR PRESSURE PORT CODE:2,3,4,B,Q,S,U,G

Code	Port	Dim B	Dim C Typ.	Dim D Typ.	Dim E Typ.
2	1/4-19 BSPP	0.547 [13.9]	0.366 [9.3]	0.708 [17.98]	0.075 [1.91]
3	G3/8 JIS B2351	0.615[13.9]	0.366[9.3]	0.875[21.78]	0.075[1.91]
4	7/16-20UNF MALE SAE J1926-2 STRAIGHT THREAD O-RING BUNA-N 90SH-904	0.508 [12.9]	0.366 [9.3]	0.800 [20.32]	0.075 [1.91]
5	1/4-18 NPT	0.600 [15.24]	0.366 [9.3]	N/A	N/A
6	1/8-27 NPT	0.390 [9.91]	0.366 [9.3]	N/A	N/A
B	G1/4 JIS B2351	0.547[13.9]	0.366[9.3]	0.708[17.98]	0.075[1.91]
E	1/4-19 BSPT	0.500 [12.7]	0.366 [9.3]	N/A	N/A
F	1/4-19 BSPP FEMALE WITHOUT SNUBBER	0.621[15.8]	0.366[9.3]	N/A	N/A
P	7/16-20UNF FEMALE SAE J513 STRAIGHT THREAD WITH INTEGRAL VALVE DEPRESSOR	0.43 [10.9]	0.444 [11.3]	N/A	N/A
Q	M10X1.0 mm ISO6149-2	0.449[11.4]	0.366[9.3]	0.543[13.79]	0.075[1.91]
N	7/16-20UNF FEMALE SAE J513 STRAIGHT THREAD	0.43[10.9]	0.444[11.3]	N/A	N/A
S	M12 X1.5 mm ISO6149-2	0.531[13.5]	0.366[9.3]	0.661[13.79]	0.098[2.49]
U	G1/4 DIN 3852 FORM E GASKET DIN3869-14 NBR	0.519 [13.2]	0.366 [9.3]	0.744 [18.9]	0.047 [1.19]
W	M20 X1.5 mm ISO 6149-2	0.551[14.0]	0.441[11.2]	N/A	N/A
G	M14 X1.5 mm ISO 6149-2	0.531[13.5]	0.366[9.3]	0.740[18.8]	0.098[2.49]

ORDERING INFORMATION

M5600 – 0 0 0 0 0 2 – 05KP G

Certification

0	RoHS, FCC, ISED, RED, CE
1	RoHS, FCC, ISED, RED, CE HazLoc/ATEx certified: IS Class I, Div1, Groups A, B, C, and D; Class I Zone 0, AEx ia IIC T4 Ga; Ex ia IIC T4 Ga; ll 1 G Ex ia IIC T4 Ga

Port Material

0	17-4PH
1	316L Stainless Steel

Cleaning

0	No Selection
1	Oxygen clean B40.1 Level IV
2	With Snubber

Output Protocol

0	Standard
1	Beaconing

Battery Type

0	No Battery Option
1	CR2032 (Panasonic & Energizer)
2	CR2032 (Sony & MuRata)
3	CR2050W (MuRata)

Notes:
Designations relate to product label and operating temp range
No battery is shipped with the sensor
Battery option 0 for M5600 only
Battery options 1, 2, 3 for M5601 only

Label Type

0	Adhesive Label
1	Laser Marking

Pressure Type

G	Gauge
S	Sealed (≥1kpsi)
C	Compound

Compound pressure range is -14.7 to xxxpsig or -1 to xxxbarg.
(e.g. 200PC: -14.7 to 200psig, 020BC: -1 to 20barg)
Sealed type is recommended for high humidity environments.

Pressure Range [psi]

psi STD	bar STD
050P	3.5B
100P	007B
300P	020B
500P	035B
01KP	070B
03KP	200B
05KP	350B
10KP	700B
15KP	01KB

Intermediate Ranges between 3.5bar to 1kbar available upon request

Pressure Port

2	1/4-19 BSPP
3	G3/8 JIS B2351
4	7/16-20UNF Male SAE J1326-2 Straight Thread O-Ring BUNA-N 90SH-904
5	1/4-18 NPT
6	1/8-27 NPT
B	G1/4 JIS B2351
E	1/4-19 BSPT
F	1/4-19 BSPP Female Without Snubber
P	7/16-20 UNF Female SAE J513 Straight Thread With Integral Valve Depressor
Q	M10x1.0 mm ISO 6149-2
N	7/16-20 UNF Female SAE J513 Straight Thread
S	M20X1.5mm ISO 6149-2
U	G1/4 DIN 3852 Form E Gasket DIN3869-14 NBR
W	M20X1.5mm ISO 6149-2
G	M14X1.5mm ISO 6149-2