M5601

Wireless Pressure Transducer

- Atex Certified for Class 1, Div 1
- 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
- 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 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 M5601 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 M5601 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 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;
II 1 G Ex ia IIC T4 Ga

FCC, ISED and RED compliant

your distributor
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STANDARD RANGES

Range (psi)	Range (Bar)	Gage	Sealed	Compound
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.

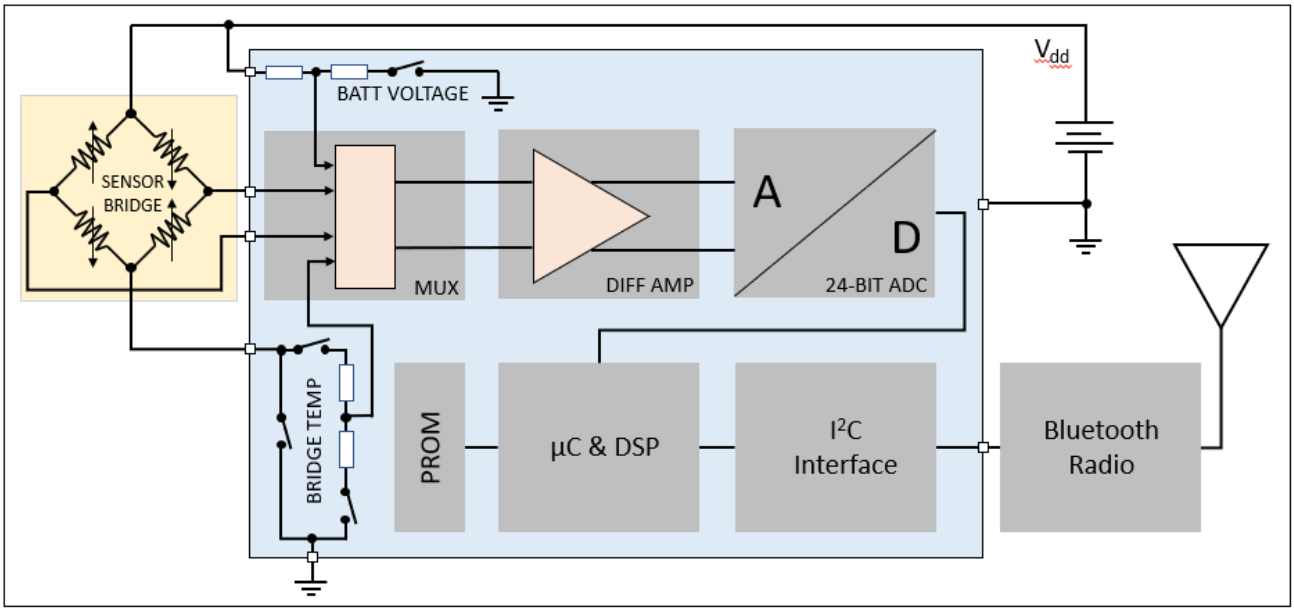
Parameters		Min	Typ	Max	Units	Notes
Supply Voltage		2.3	3	3.6	V_{DC}	Replaceable CR2032/CR2050 battery
Accuracy		-0.25		0.25	%F.S.	RSS of linearity, hysteresis, and repeatability
Resolution			0.00005		%F.S.	
Output Protocol			Digital I^2C			
A/D Resolution			24		Bit	
Operating frequency			2.4		GHz	
Cycle life		1.00E+6			0~FS Cycles	
Stability		-0.25		0.25	%F.S./year	
Total Error Band	Port material 17-4PH for all ranges	-1		1	%F.S.	@25°C over compensated range
	Port material 316L for range≤3K psi	-1.5		1.5	%F.S.	
	Port material 316L for range > 3K psi	-2		2	%F.S.	
Proof Pressure		2X		20k psi	Rated	
Burst Pressure		5X		20k psi	Rated	
Compensated Temperature		-10		+60	°C	
Operating Temperature		-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		1-5 years depending on use				
Battery Level		Battery level reported in upload data				
Weatherproof		IP65				
Pressure Port Material		17-4PH Stainless Steel or 316L Stainless Steel				
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

ATEX Intrinsic Safety for Explosive Atmospheres EU type approval
IECEx Intrinsic Safety for Explosive Atmospheres international certification
CSA Intrinsic Safety for Hazardous Locations for US and Canada
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.

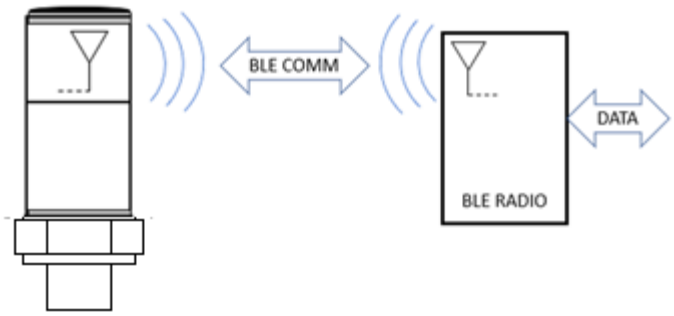
3. The Model M5601-xxx2xx-xx and Model U5601-xxx2xx-xx Pressure Transducer shall use only the CR2032 Sony/Murata cell. The ambient range is Ta = -20°C to +70°C.

4. 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.

COMMUNICATION PROTOCOLS

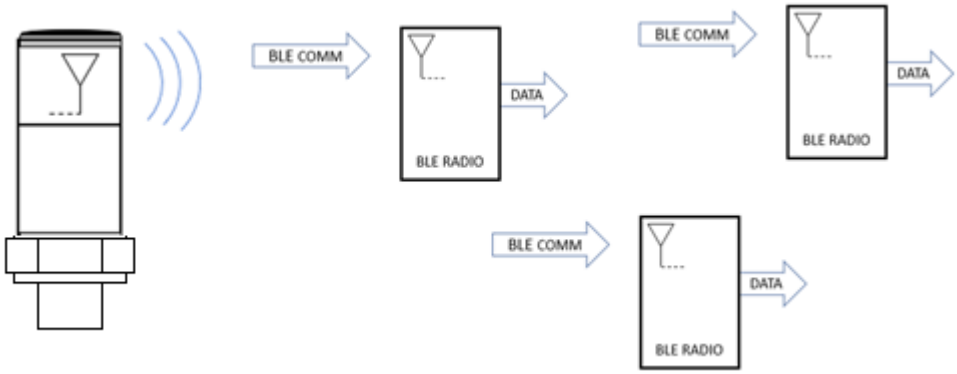
Pairing mode (Model M5601 – xx0):

- 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 M5601 – 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.



ORDERING INFORMATION

Part Number

M5601 – 0 0 0 2 0 2 – 05KP G

Certification

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; II 1 G Ex ia IIC T4 Ga

Port Material

0	17-4PH
1	316L

Cleaning

0	No Selection

Output Protocol

0	Standard
1	Beaconing

Battery Type

2	CR2032 (Sony & MuRata)
3	CR2050W (MuRata)

Notes:
Designations relate to product label and operating temp range
No battery Is shipped with the sensor

Label Type

0	Adhesive Label
1	Laser Marking

Pressure Type

G	Gauge
S	Sealed (≥1kpsi)
C	Compound

Compound pressure range is -14.7 ti 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 STD	bar STD
01KP	070B
03KP	200B
05KP	350B
10KP	700B
15KP	01KB

Intermediate Ranges between 35bar to 1kbar available upon request

Pressure Port

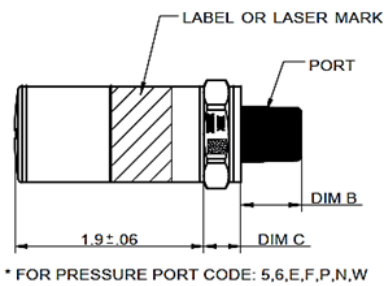
2	1/4-19 BSPP
4	7/16-20UNF Male SAE J1326-2 Straight Thread O-Ring BUNA-N 90SH-904
5	1/4-18 NPT

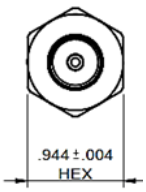
STANDARD IN STOCK MODELS*

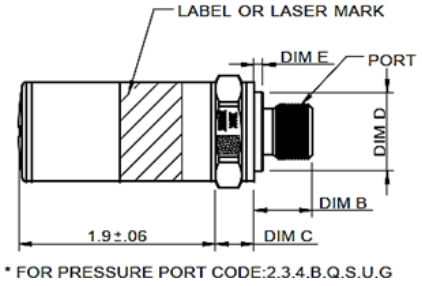
0 – Standard Output Protocol	1 – Advertising Output Protocol
M5601-000205-01KPS	M5601-001205-01KPS
M5601-000205-05KPS	M5601-001205-05KPS
M5601-000205-10KPS	M5601-001205-10KPS
	M5601-001315-01KPS
	M5601-001315-03KPS

*Additional certified customizations available pending business case review, contact factory for customizations

DIMENSIONS







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]
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

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