

Wireless Pressure Sensor

Pressure Sensor Three (PS3)



Features:

- Pressure Ranges from 100 to 10,000 psi
- Dual-Mode: Absolute and Gauge
- 0.1% Error Band
- Integrated Antenna
- Internal High-Capacity Battery

Compatibility:

- IEEE 802.15.4 Transceiver
- ISM 2.4 GHz Frequency
- ZigBee/IEEE 802.15.4 Compliant
- 2" Fig 1502 Weco Hammer Union

Device Description

Measuring about 18 cm wide and 25 cm high, the patent-pending PS3 is a completely self-contained wireless pressure sensor. Highly accurate pressure measurements are transmitted wirelessly to a suitable base station, such as Electrochem's BS1, and passed to a host system such as a PC or PLC. The internal battery powers the sensor for the entire calibration period of one year. The standard 2" Weco 1502 pressure fitting makes installation a breeze.

Advanced Sensing

Pressure is measured utilizing an all stainless-steel wetted surface pressure diaphragm with a proprietary sputtered thin-film full-bridge strain gauge circuit. The sputtered metal strain gauge circuit offers superior long-term stability and higher temperature capability than other strain gauge technologies. The replaceable stainless-steel isolation diaphragm protects the sensitive measurement surface.

Integrated Data Acquisition

Signals are amplified and digitized into 24-bit words and converted to units of measure at a rate of up to 480 readings per second. This is accomplished using a precision mixed-signal microcontroller (MCU) which integrates an analog-to-digital converter (ADC) and a high-speed microcontroller. Accurate measurements are passed to the wireless sub-section for transmission.

Cutting Edge ZigBee

Our ZigBee/IEEE 802.15.4 compliant wireless interface combines an ultra-low power RF transceiver with protocol software to form a transparent wireless communication solution that has self-organized and self-healing properties. This mesh network allows for ease of installation around obstructions, redundancy in communication paths and longer range. The 2.4 GHz frequency band is suitable for world-wide use.

Capable Radio Hardware

The IEEE 802.15.4 Standard details the Physical Layer (PHY) and Medium Access Control (MAC) specifications, and offers the building blocks for different types of networking known as "star, mesh, and cluster tree." Network routing schemes are designed to ensure power conservation, and low latency through guaranteed time slots. Communication redundancy is a unique feature of the ZigBee network layer, eliminating "single point of failure" in mesh networks. Key features of the PHY include energy and link-quality detection, and clear channel assessment for improved coexistence with other wireless networks. The MAC specifies automatic packet acknowledgement, provides options for transmission in a range of pre-selected time intervals, and supports 128-bit AES security. The MAC and ZigBee application software is implemented in a code-efficient microcontroller that communicates digitally with the sensor data acquisition hardware.



Purchasing Information

PressureSensorThree PS3-RANGE (Replace RANGE with selection from below.)

Parts:

Battery BCX85 D
 Silicone Isolation Fluid 100617
 Isolation Diaphragm
 Up to 500 psi 100633
 Up to 6000 psi 100634
 Up to 10000 psi 100635

Accessories:

Base Station One (USB) BS1-U
 Base Station One (RS-232) BS1-R
 Base Station One (Advanced) BS1-NG

Weco is a registered trademark of FMC Technologies.

**For complete product specifications, pricing and accessory information:
 Call (716) 759-5800 or visit www.ElectrochemSolutions.com**

SPECIFICATIONS: Typical for 25° C unless otherwise specified.

PERFORMANCE

Pressure ranges 100, 500, 1000, 1500, 3000, 5000, 7500,
 and 10000 psi
 Pressure reference Absolute and sealed gauge
 Errors
 Zero ±0.5% of range; User-nullable
 Total excluding zero ±0.1% of range
 Output format 32-bit floating point (IEEE754)
 Output rate 0.3 to 480 readings per second

ENVIRONMENTAL

Operating temperature -40°C to 85°C
 Compensated temperature -40°C to 85°C
 Thermal effects
 Zero shift ±0.1% of range
 Span shift ±0.1% of range

ELECTRICAL

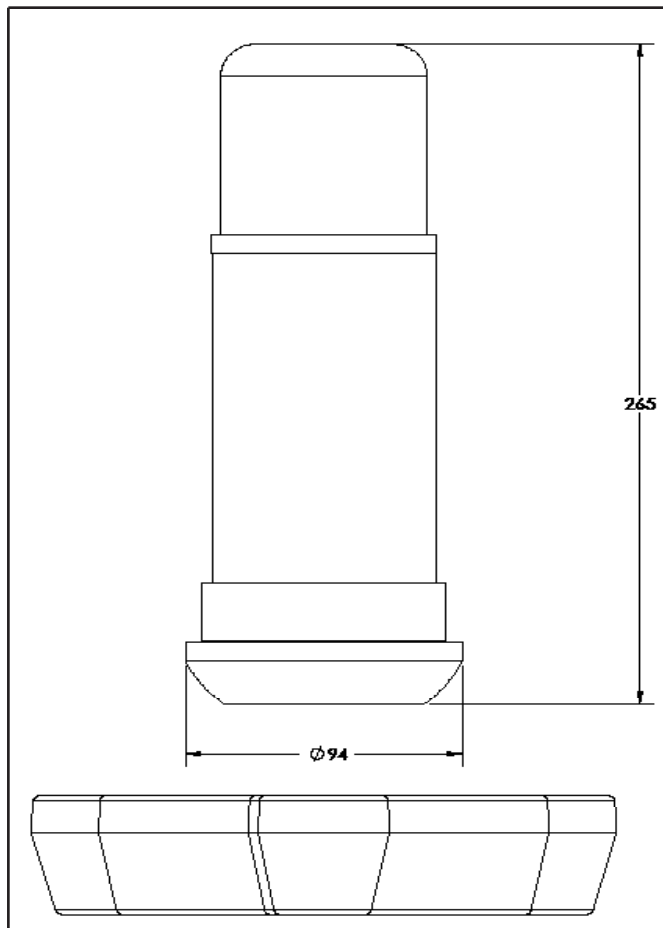
Battery
 Type Electrochem BCX85
 Size D
 Voltage 3.9 V
 Battery life
 Standard range 1 year
 Extended range 2 months
 Insulation resistance >100 megohms @ 50 VDC

WIRELESS

Range
 Standard
 Indoor/urban 30 m
 Outdoor line-of-sight 100 m
 Extended
 Indoor/urban 100 m
 Outdoor line-of-sight 1500 m
 Operating frequency ISM 2.4 GHz
 Agency approvals
 Standard
 FCC Part 15.247 OUR-XBEE
 Industry Canada (IC) 4214A-XBEE
 Europe ETSI
 Extended
 FCC Part 15.247 OUR-XBEEPRO
 Industry Canada (IC) 4214A-XBEEPRO
 Europe ETSI

MECHANICAL

Media Gas, liquid
 Wetted parts material 15-5 PH, 316L stainless steel
 Welds Single electron beam
 Proof pressure (sensor only) 2X range
 Burst pressure (sensor only)
 Up to 500 psi 6X range
 Up to 6000 psi 5X range
 Up to 10000 psi 4X range
 Pressure port 2" Fig 1502 Male Sub
 Wing nut 2" Fig 1502 FMC
 Weight 8 kg



All dimensions are shown in millimeters.