

## Wireless Signal Conditioner

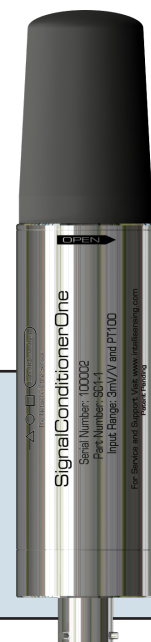
### Signal Conditioner One (SC1)

#### Features:

- Connects to standard pressure and temperature sensors
- Full excitation provided
- Integrated Antennae
- Internal Battery

#### Compatibility:

- IEEE 802.15.4 Transceiver
- ISM 2.4 GHz Frequency
- ZigBee/IEEE 802.15.4 Compliant



#### Device Description

Measuring about 180 millimeters long, the patent-pending SC1 is a compact, self-contained wireless signal conditioner. Accurate voltage and current references are provided to connect to your existing pressure and temperature sensors. The analog signals are converted to units of measure and transmitted wirelessly to a suitable base station such as the BS1, and passed to a host system such as a PC or PLC. The internal battery powers the conditioner and sensors for the entire calibration period of one year.

#### Sensor Compatibility

The SC1 is compatible with most standard pressure and temperature sensors that already exist at your facility. Retrofitted sensors will coexist with new sensors that have integrated wireless functionality, such as Electrochem's PS1 wireless pressure sensor and the TS1 wireless temperature sensor.

#### Integrated Data Acquisition

Signals are amplified, digitized into 24-bit words and converted to units of measure at a rate of up to 480 readings per second. This is all 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 subsection 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-organizing 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 worldwide 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

SignalConditionerOne ..... SC1 - 1

**Parts:**

Battery ..... 100402

**Accessories:**

Mating Connector ..... 100800

Base Station One (USB) ..... BS1-U

Base Station One (RS-232) ..... BS1-R

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

**SPECIFICATIONS:** Typical for 25° C unless otherwise specified.

## PERFORMANCE

Pressure errors (+ sensor)

Zero .....  $\pm 0.5\%$  of range; user-nullable

Total excluding zero .....  $\pm 0.1\%$  of range

Temperature error (+ sensor).....  $\pm 1.0^\circ\text{C}$

Output format ..... 32-bit floating point (IEEE754)

Output rate ..... 0.3 to 480 readings per second

## ELECTRICAL

Pressure sensor interface

Excitation output voltage ..... 3.0 VDC

Signal input voltage ..... 3 m V/V

Temperature sensor interface

Excitation output current ..... 100  $\mu\text{A}$

Input signal ..... Pt100 RTD (ITS-90)

Battery

Type ..... Lithium thionyl chloride (Li/SOCl<sub>2</sub>)

Size ..... 2/3 AA

Voltage ..... 3.6 V

Battery life

Standard range ..... 1 year

Extended range ..... 2 months

Insulation resistance ..... >100 megohms @ 50 VDC

Electrical connector ..... Bendix PTH-10-6P or equivalent

Mating electrical connector ..... Bendix PT06A-10-6S or equivalent

## 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

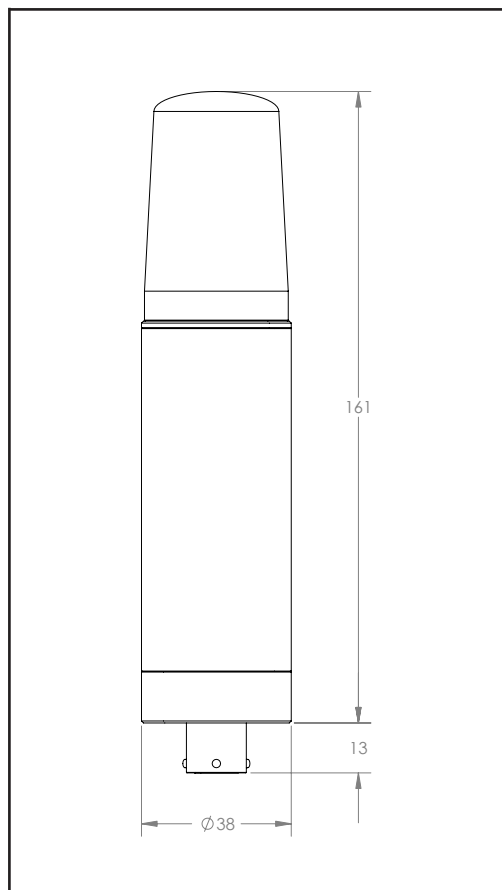
## MECHANICAL

Weight ..... 500 g

## ENVIRONMENTAL

Operating temperature .....  $-40^\circ\text{C}$  to  $85^\circ\text{C}$

Compensated temperature .....  $-40^\circ\text{C}$  to  $85^\circ\text{C}$



All dimensions are shown in millimeters.