ELECTROCHEM
CREATING TOMORROW

Wireless Temperature Sensor

Temperature Sensor One (TS1)

Features:

- Probe Range of -100°C to 200°C
- ± 1°C Error band
- Stainless Steel Construction
- Integrated Antennea
- Internal Battery

Compatibility:

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

Device Description

Measuring about 200 millimeters long, the patent-pending Electrochem TS1 is a compact, self-contained wireless temperature sensor. Highly accurate temperature measurements are transmitted wirelessly to a suitable base station such as the Electrochem 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.

Advanced Sensing

Of the many detectors devised for temperature measurement, the configuration that offers the best stability with the lowest hysteresis, is one in which a platinum coil is supported inside the capillaries of a two or four-bore, high-purity alumina insulator. We utilize this wire-wound type, in which the platinum winding is supported by a high temperature alumina powder inside a ceramic tube. This construction provides a detector in which stability, interchangeability, and accuracy are the highest available for industrial and scientific applications.

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.

GREATBATCH

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Rev. 0000

Purchasing Information

TemperatureSensorOne .... TS1-LENGTH (Replace LENGTH with selection from below.)

Parts:

Battery 100402

Viton O-Ring 100116

Silicone O-Ring 100117

Weco is a registered trademark of FMC Technologies.

Accessories:

Port Adapters

    1/4" NPTM to AS5202-04 100426

    1/4" NPTF to AS5202-04 100427

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

SPECIFICATIONS: Typical for 25º C unless otherwise specified.

PERFORMANCE

Probe lengths .... 36 mm (-1), 61 mm (-2)

Error band .... ±1°C

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

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

ENVIRONMENTAL

Operating temperature .... -40°C to 85°C

Probe temperature .... -100°C to 200°C

ELECTRICAL

Battery

    Type .... Lithium thionyl chloride
        (Li/SOCl2)

    Size .... 2/3 AA

    Voltage .... 3.6 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 .... None

Port burst pressure .... 40000 psi

Port AS4395E04
        (mates with AS5202-04)

Weight .... 500 g

All dimensions are shown in millimeters.