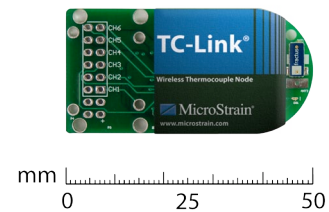


TC-Link[®]OEM

2.4 GHz OEM Wireless Thermocouple Node



Introduction

TC-Link[®]OEM provides engineers with a low cost way to embed wireless temperature sensing in industrial systems. It is a complete wireless thermocouple node, designed for easy integration with wireless sensor networks. The node combines full thermocouple conditioning with award-winning MicroStrain[®] wireless systems.

TC-Link[®]OEM features six standard thermocouple input connectors with an embedded cold junction temperature sensor. On-board linearization algorithms are software programmable to support a wide range of thermocouple types (J, K, N, R, S, T, E, B).

The node can simultaneously log data to internal memory, and transmit real-time data to a base station transceiver at a pre-programmed rate. At the base station, data is displayed and logged for further analysis. Embedded software provides the user-programmable wireless transmission rates, from two samples per second to one sample every seventeen minutes. And since each node has a unique address, a single host transceiver can address hundreds of sensor nodes.

If using a battery, the processor is capable of conserving power by using a micropower sleep mode in between samples, further enhancing the node's long term data transmission capabilities.

The TC-Link[®]OEM wireless thermocouple node features an open-architecture bidirectional communications standard (IEEE 802.15.4 spread spectrum 2.4 GHz), which supports license-free operation worldwide. Starter kits include TC-Link[®]OEM wireless thermocouple nodes, base stations, and PC software for wireless node configuration, data acquisition, and data display.

Also included is a complete *Data Communications Protocol Manual* to enable users to develop their own applications.

Features & Benefits

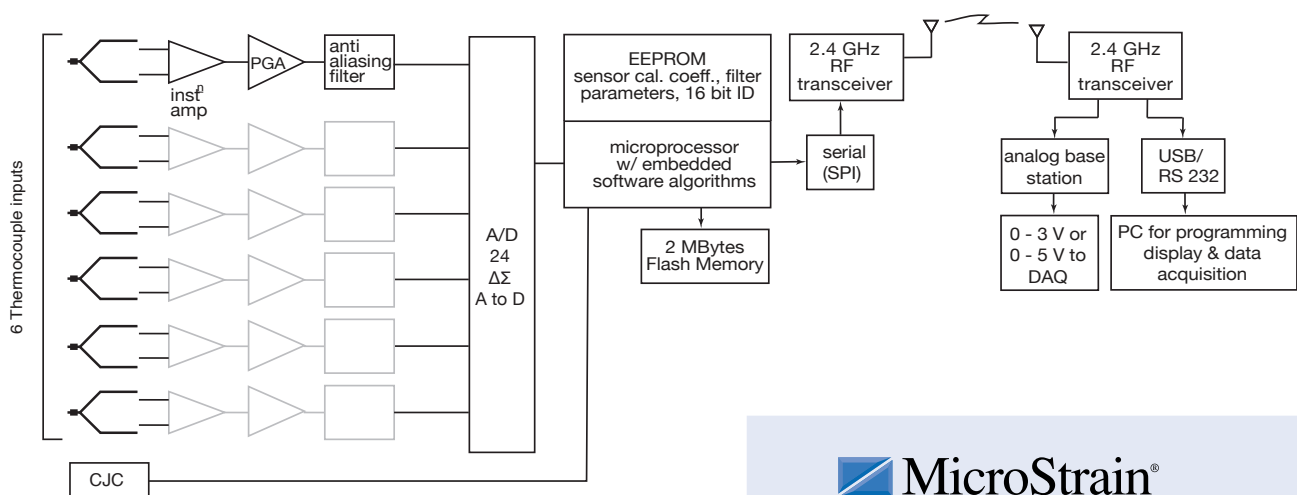
- quickly add wireless sensing and logging capabilities to existing thermocouples and probes
- supports type J, K, N, R, S, T, E, B thermocouples with on-board cold junction compensation
- transmit data in real time or log data to 2MB, non-volatile flash memory
- low cost per channel, with 6 thermocouples per node and simultaneous acquisition from multiple nodes
- miniature board footprint (50.3 mm x 25.4 mm x 5.9 mm) easily embedded into custom product or application
- self-calibrating 24 bit sigma-delta analog-to-digital converter
- sample rates from 2 Hz to 1 sample every 17 minutes
- 2.4 GHz IEEE 802.15.4 spread spectrum radio with 70 m line-of-sight range (100 m with high gain antenna), license free worldwide

Applications

- civil structures sensing: concrete maturation
- industrial sensing networks: machine thermal management
- food and transportation systems: refrigeration, freezer performance monitoring
- advanced manufacturing: plastics processing, composite cure monitoring
- assembly line testing with smart packaging
- cryogenic applications

Specifications

| | |
|--|--|
| Thermocouple inputs supported | software selectable: type-J, K, N, R, S, T, E or B six-input channel, one ambient CJC channel |
| Standard thermocouple measurement range | J: -210 to 760 °C; K: -200 to 1372 °C; N: -200 to 1300 °C; R: -50 to 1664 °C; S: -50 to 1664 °C; T: -200 to 400 °C; E: -200 to 1000 °C; B: 250 to 1820 °C |
| Temperature measurement accuracy | ± 0.1 % full scale or ±2 °C, whichever is greater (does not include errors due to TC wire or transducer) |
| Temperature repeatability | ±0.1 °C (does not include errors due to TC wire or transducer) |
| Temperature resolution | 0.0625 °C |
| Cold junction compensation range | -20 to 85 °C |
| Thermocouple connector | direct solder connection |
| Analog to digital (A/D) converter | 24 bit sigma-delta A/D |
| Sample Rate | programmable from 2 Hz to 1 sample every 17 minutes for datalogging or LDC modes |
| Datalogging mode | log up to 90,000 data sets (up to 630,000 data points) |
| Nodes per base station | supports up to 100 nodes per base station |
| Sample rate stability | datalogging and LDC modes ±25 ppm |
| Radio frequency (RF) transceiver carrier | 2.4 GHz, direct sequence spread spectrum, license free worldwide (2.405 to 2.480 GHz) - 16 channels, radiated power 0 dBm (1 mW) |
| Range for bi-directional RF linktt | up to 70 m line-of-sight, up to 100 m with high gain antenna on base station |
| RF data packet standard | IEEE 802.15.4, wireless communication architecture |
| PC Communications | 115,200 baud over USB |
| Power supply | external power from 3.2 to 9 volts |
| Power consumption | 2 samples per second - 0.8 mA 1 sample per second - 0.48 mA 3 samples per minute - 0.1 mA 1 sample per minute - 0.09 mA |
| Operating temperature | -40 to 85 °C (electronics only, cjc limited to -20 to 85 °C) |
| Maximum acceleration Limit | 500 g standard (high g option available) |
| Dimensions | 50.3 mm x 25.4 mm x 5.9 mm (board only), 57.7 mm x 25.4 mm x 9.1 mm (board with right angle, external pin connector) for dimensional print go to www.microstrain.com |
| Weight | 4.7 grams (circuit board assembly only), 6.3 grams (board and right angle external pin connector) |
| Compatible Base Stations | USB, RS-232, Analog, WSDA ® |
| Software | TC-Link ® Node Monitor, Windows XP/Vista compatible |



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