TC-Link®

2.4 GHz Wireless Thermocouple Node

Introduction

Combining full thermocouple conditioning with MicroStrain's award-winning wireless systems, TC-Link® is a complete wireless thermocouple node, designed for integration with wireless sensor networks.

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

When powered, the TC-Link® transmits data to a base station transceiver up to 70m away at a pre-programmed rate, where data is displayed and logged for further analysis. Featuring programmable sweep rates, these little nodes pack a lot of power in a small package; and since each node has a unique address, a single host transceiver can address thousands of sensor nodes. The base station may trigger one or all nodes, sending a timing signal for millisecond network synchronization.

Embedded software provides wireless transmission at user-programmable rates from one sample per minute to ten samples per second, and the processor conserves battery power by using micropower sleep modes in between samples.

Miniature enclosures include thin, rechargeable Lithium batteries. TC-Link® 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 two TC-Link® wireless thermocouple nodes, one USB base station, and PC software for wireless node configuration, data acquisition, and data display.

Features & Benefits

- 2.4 GHz direct sequence spread spectrum radio is license free worldwide
- IEEE 802.15.4 open communication architecture
- supports simultaneous data transmission from multiple sensors
- sample rates from 1 sample/hour to 10 samples/second
- communication range up to 70m
- supports type J, K, R, S, T, E, B thermocouples
- includes on-board cold junction compensation
- low-power consumption for extended use

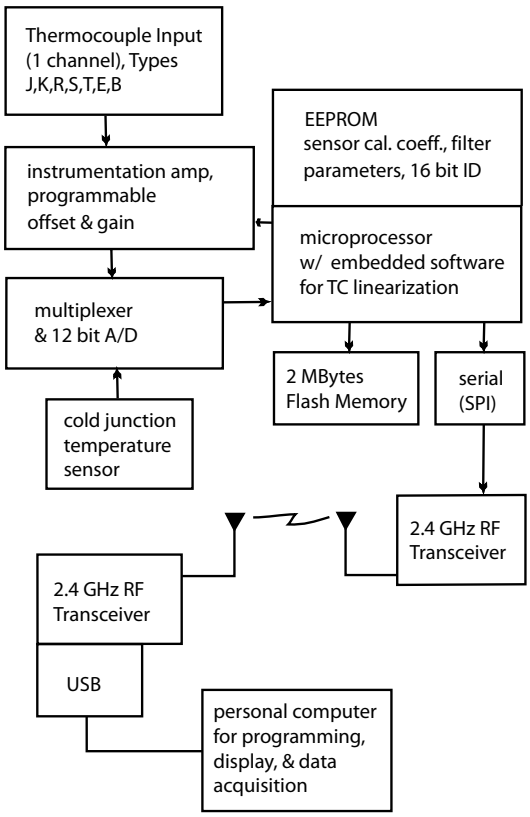
Applications

- 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, R, S, T, E, B single input channel
Standard thermocouple measurement range	J 0 to 760 ˚C K 0 to 1370˚C R 0 to 1000˚C S 0 to 1750˚C T -160 to 400˚C E -100 to 1000 ˚C B 200 to 2000 ˚C
Temperature measurement accuracy	± 0.2% full scale or ±2˚C typical (does not include errors due to TC wire or transducer)
Temperature measurement resolution	0.2˚C
Cold junction compensation range	-40 to 85˚C
Thermocouple connector	type 1 standard mini connector for flat pin TC inputs
Operating modes	Mode 1: transmit data at programmable rate
Analog to digital (A/D) converter	successive approximation type, 12 bit resolution
Linearized TC transmit rate	programmable from 1 sample/hour to 10 samples/second
Radio frequency (RF) transceiver carrier	2.4 GHz, direct sequence spread spectrum, license free worldwide (2.450 to 2.490 GHz - 16 channels
RF output power	0dBm (1 mW)
Range of RF link	up to 70m line of sight, up to 300 m with high gain antenna
RF data packet standard	IEEE 802.15.4, open communication architecture
USB programming and download	115,200 baud
Internal Li-ion battery	rechargeable 3.7 volt lithium ion, 200 mAh capacity. Customer may also supply external power from 3.1 to 9 volts
Power consumption	175 microamps at 1 Hz update rate
Operating temperature	-20 to +60˚C with standard internal battery and enclosure, extended temperature range optional with custom battery and enclosure. -40 to +85˚C for electronics only
Dimensions*	62 mm x 58 mm x 26 mm without antenna (board only 58 mm x 36 mm x 24 mm)
Weight	48 grams
Case	ABS plastic

*For dimensioned print go to www.microstrain.com



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Patents Pending