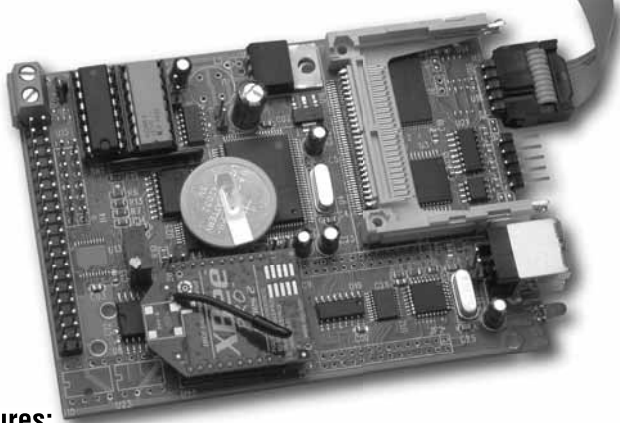# T-Box™ (TB)

Low Cost Temperature Data Acquisition and Control
0.5°C Accuracy Temperature IC-Sensors, Thermocouples, Ethernet, ZigBee Wireless, RS232/485, CompactFlash, Push Buttons, LCD and Solenoid Drivers, All fit in a Box

NEW!

Features:

- 3.0 x 3.6", 50 µA standby, 200 mA, 5-24V DC power
- C/C++ programmable, Ready to use Demo firmware
- Supports temperature IC-Sensors with 0.5°C accuracy
- 16 ch. 24-bit ADC supporting Thermocouples
- 11 ch. 12-bit ADC, or TTL I/Os, or Solenoid drivers
- CompactFlash with FAT file system support
- 16x2 line LCD, Real time clock, timer/counters, PWM output
- UART with RS-232, or RS485, or ZigBee wireless support
- 10/100-baseT Ethernet module or a slave USB port

Summary

Boxed in an extruded aluminum enclosure, the **T-Box™ (TB)** is designed as a low cost, portable temperature data logger, or an industrial embedded controller.

The **T-Box™ (TB)** is ideal for distributed temperature sampling. Each board has an on-board temperature sensor and can acquire, process, and record readings from over 100 additional low cost external Temperature IC Sensors (TS). Each group of 8 IC-Sensors can be addressed and read remotely over two I/O lines. The IC-Sensor has 0.5°C accuracy over the temperature range of -40°C to +125°C. Typical applications for the **T-Box™ (TB)** include cooler/freezer temperature monitoring, recording, and reporting for food safety applications. The **TB** can also easily be used in building heating and cooling system control.

In addition to processing Temperature IC Sensors (TS), the **T-Box** also integrates 24-bit ADCs, RS232/485 serial, Solenoid Drivers, TCP/UDP over Ethernet, ZigBee Wireless, 16x2 lines LCD and CompactFlash for mass temperature data storage. The **TB** is C/C++ programmable with TERN's development platform. Ready to use demo firmware can be loaded into the on-board Flash memory.

I/O Details

A sigma-delta 24-bit ADC (LTC2448) can be installed to provide 8 ch. differential or 16 ch. single-ended input channels. Variable speed/resolution settings (up to 5 KHz) can be configured. The LTC2448 works well directly with strain gages, current shunts, RTDs, resistive sensors, or 4-20mA current loop sensors, or thermocouples in differential mode.

Mass data stored on a local CF card (up to 2 GB) can be easily transferred to a PC. FAT16 file system libraries are provided with the development system.

A real time clock (RTC72423) can provide clock/calendar for time stamp usage. A UART (SCC2691) supports RS232, or RS485, or ZigBee wireless. On-board sockets and demo software are available to support XBee and XBee-PRO ZB embedded RF modules (www.digi.com).

A CPU internal UART is used as RS232 DEBUG port. Three internal timer/counters can be used to count or time external events, or to generate PWM outputs. An optional 10/100-baseT Ethernet module or a slave USB port can be installed.

Fourteen PIO lines can be used to drive Temperature IC Sensors (TS), or can be buffered by solenoid drivers. These solenoid drivers are capable of sinking 350 mA at 50V per line, and they can directly drive solenoids, relays, or lights. A 11 ch. 12-bit ADC(TLC2543) can be installed.

The **TB** can use 8.5V to 12V DC power supply with default linear regulator, or up to 30V DC with switching regulator without generating excessive heat, or uses as low as 5.1V-9V battery with low drop regulator (TPS765) installed.

A 16x2 line character LCD can be installed. The TB is designed to fit in an aluminum extrusion enclosure.

Ordering Information

TB	**$169/$129/$89**	**Qty 1/100/1K+**

Includes: CPU, I/Os, 2 RS232s, 3 timers, 7 solenoid drivers, PIOs, EE, 256KW Flash, 64KW SRAM.

NOT including add-on options. OEM option discounts available.

Add-on Options:

1) SRAM 256KW	$20
2) RTC and battery	$20
3) CompactFlash Interface.	$20
4) 16 ch. 24-bit ADC (LTC2448)	$40
5) 11 ch. 12-bit ADC (TLC2543)	$30
6) 16x2 character LCD	$40
7) Ethernet/TCP Module (i2chip)	$30
8) USB Controller, slave	$30
9) RS485 driver for SCC2691	$10
10) Switching regulator/Low-drop regulator	$20
11) 5V Precision Reference for ADC	$15
12) Aluminum Extrusion Enclosure	$50
13) Temperature IC sensor	$10
14) Sockets(10x2) for XBee wireless module	$20

Typical Order Example:

TB, 256KW SRAM

TB + 1 = $169 + $20 = $189