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# INSTRUCTION MANUAL

## Sensoray Models 7409TC/7409TDIN
## Termination Boards

01/11/2000

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M A N U A L - 7 4 0 9 T C / 7 4 0 9 T D I N

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## Introduction

Sensoray Models 7409TC and 7409TDIN are termination boards that may be used to break out any 40-pin Smart A/D™ header connector onto screw terminals. Each of eight sensor channels is allocated a dedicated, five-circuit, removable terminal block.

Option shunts are provided to enable interruption of input signal paths between header and screw terminals so that custom circuitry may be inserted into the paths. A prototyping area, consisting of an array of plated-through pads on 100-mil center spacing, is provided for construction of custom circuitry.

Signal conditioning circuits (SCCs) are provided to facilitate thermocouple open sensor detection. In addition, a calibrated temperature sensor is provided for thermocouple compensation.

Model 7409TC is a circuit board assembly that includes all of the features described above. Model 7409TDIN consists of a 7409TC assembly with integral DIN rail mounting hardware.

## Implementing Custom Circuitry

As shown in the table to the right, jumper posts E17 through E32 route the sense leads of the eight terminal blocks to the 40-pin header. Shunts are factory installed at all of these positions, effectively bypassing the prototyping area.

| Chan | Jumpers | |
|---|---|---|
| 0 | E15 | E16 |
| 1 | E13 | E14 |
| 2 | E11 | E12 |
| 3 | E9 | E10 |
| 4 | E7 | E8 |
| 5 | E5 | E6 |
| 6 | E3 | E4 |
| 7 | E1 | E2 |

Remove these shunts to insert custom circuits in the sense signal path between the terminal blocks and the header.

User-supplied custom circuits can be connected to header and terminal block circuits by means of pads S1 through S50. Pad S18 provides fused +12VDC power and S17 provides the 12V return for powering custom circuitry. Refer to the schematic diagram for details of pad wiring.

## Open Thermocouple Detection

Two option shunts must be installed for each thermocouple channel that requires open sensor detection.

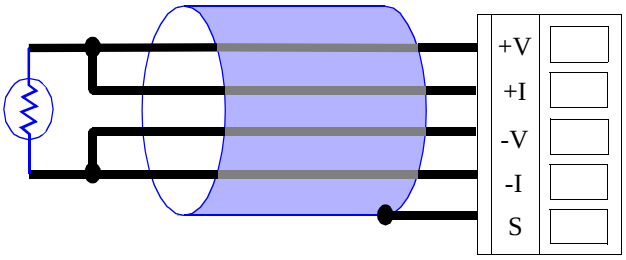
| Chan | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|
| Shunt | E15 | E13 | E11 | E9 | E7 | E5 | E3 | E1 |
| | E16 | E14 | E12 | E10 | E8 | E6 | E4 | E2 |

For example, install shunts E7 and E8 to enable the SCC for sensor channel 4.

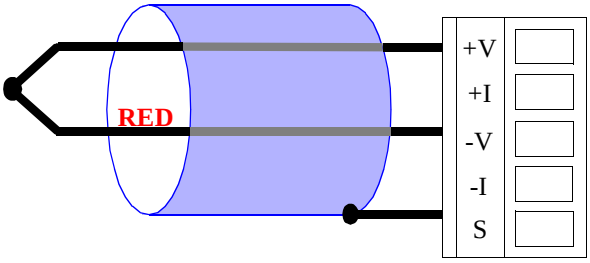
## Connections

The following diagrams show how sensors are connected to the TB. In both illustrations, the removable terminal block is shown as viewed from the top.

4-Wire Resistance Measurement




Thermocouple Measurement




**Important note for thermocouple users:**

*Exposing the TB to thermal transients can severely degrade thermocouple measurement accuracy. If you are measuring thermocouples, insulate the TB from air flows such as ambient drafts and cooling fans. For best results, encase the TB in a protective enclosure.*

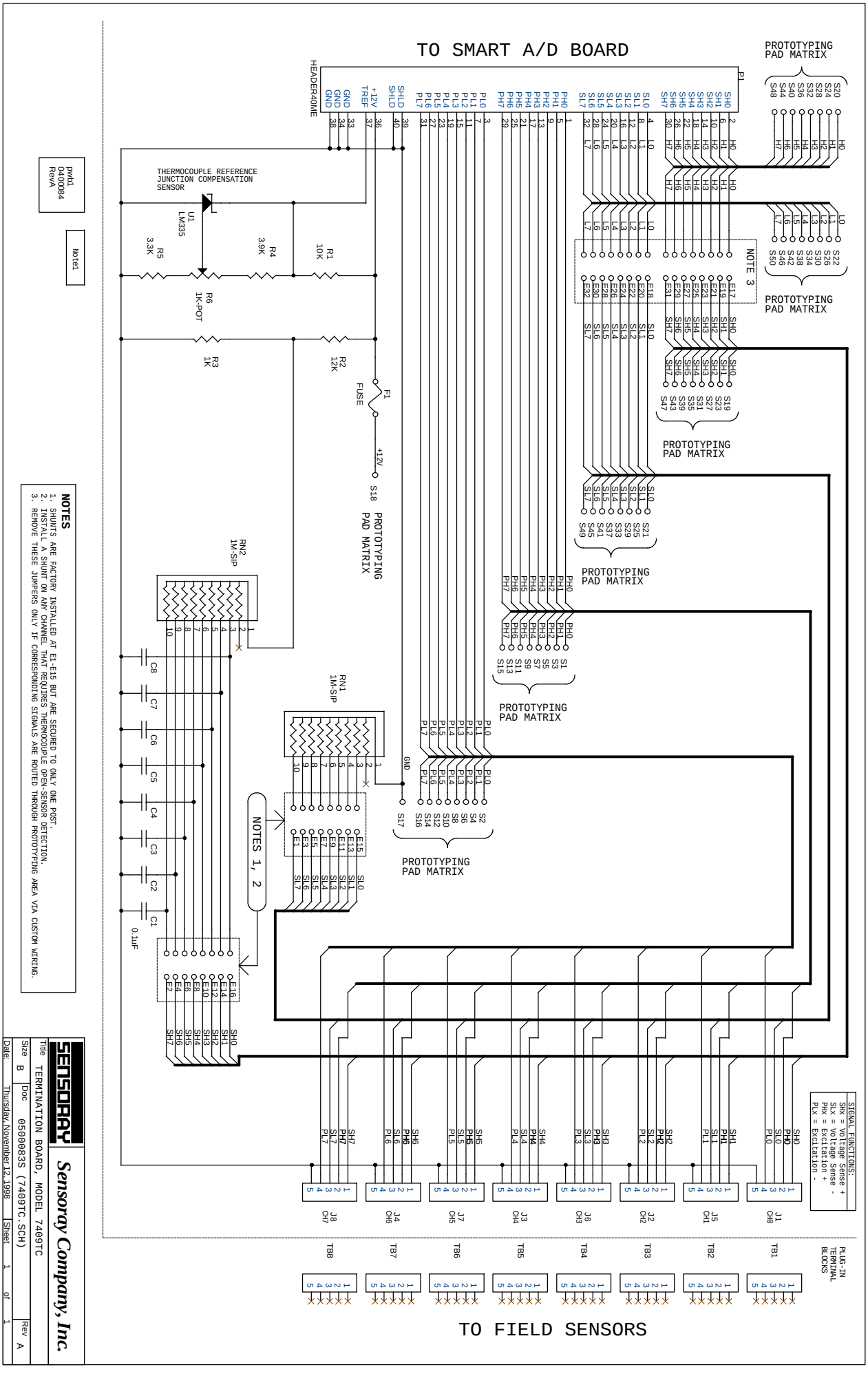
## Calibration

TB boards may be freely interchanged because their onboard temperature sensors are calibrated. Although the sensor is factory calibrated, it may be necessary to recalibrate it after extended time in service or due to exposure to extraordinary environmental stress.

Calibration Procedure

1. Connect a calibrated Smart A/D™ to the TB. Connect a calibrated thermocouple to the TB and immerse the “hot” end into a precise, thermally controlled environment. Allow at least ten minutes after power-up for the system to warm up and stabilize.
2. On the TB, adjust potiometer R6, then reset and re-initialize the Smart A/D™ and read the thermocouple data.
3. Repeat step 2 until the Smart A/D™ indicates the correct thermocouple temperature.

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