



ENDCAP Alignment

TEMPERATURE CONVERSION BOARD

User's Manual

FNAL – PNPI
2003

1. Introduction

The temperature conversion board provides a stable 11.3 V voltage for 18 temperature sensors, their adjustment and cross-connection to the multiplexer unit of the Agilent 34970A data acquisition/switch unit. No control is required for this board.

2. Construction

The temperature conversion board has three connectors:

- J1 – 3M 40-pin header – Output to the multiplexer unit
- J2 – Low voltage power connector
- J3 – shielded 6-port RJ11 jack for connection with the temperature sensors.
Each port serves three temperature sensors (one radial link).

3. Circuit Diagram

The temperature conversion board consists of the low drop output (LDO) voltage regulator, 18 adjusted channels for the temperature sensors, and cross-connection circuitry. Voltage regulator is performed in LT1761 U1 integrated circuit with external resistive divider R19, R20 that determines the output voltage as 11.3 V.

4. Functioning

The temperature conversion board is a passive device representing a cross-connection board with internal voltage regulator. It works properly if all connections are correct and calibration of all temperature sensors is performed.

5. Debugging and Testing

Necessary equipment:

- Digital voltmeter
- 12 – 15 V power supply
- Power cable

1. Check the assembled board visually. It must not have visible damages. All components and their values must be in accordance with documents.

2. Connect the temperature conversion board under test to the power supply 12 – 15 V and turn on it. Check an input voltage at the F1 fuse; replace it if necessary.
3. Check +11.3V output voltage of the LDO voltage regulator.
4. A complete test of the analog alignment DAQ including the temperature conversion board must be performed before a final assembly. The calibration of the temperature sensors must be performed also.
5. To calibrate the temperature sensors provide the same temperature for all of them.

6. Troubleshooting and Maintenance

Output voltage of the voltage regulator is wrong.

- Check an input voltage; it should be 12 – 15 V.
- Check a fuse F1; replace it if necessary.
- Check values of the R19 and R20 resistors.
- Check polarity of the C19 and C21 tantalum capacitors (a white band marks a **positive** pad).
- If the previous checks do not discover a reason of failure, replace the U1 LTC11761 integrated circuit.

7. Specification

General

Dimensions of the board	5.6" x 2.5"
Output connector J1	40-pin 3M header 3432-5002
Power connectors J2	2-pin Molex Sabre 43160-3102
Input connector J3	6-port shielded RJ11 jack

Power characteristics

Minimum input voltage	+12 V
Maximum input voltage	+15 V
Power consumption	81 mW
Current consumption	18 x 0.3 = 5.4 mA
On board power protection:	
Fuse	0.5 A
LT1761 voltage regulator has overcurrent and overtemperature protection	

Specification of connectors

Output connector J1:

Name	Pin	Pin	Name
T ₁₋₁	1	2	GND
T ₁₋₂	3	4	GND
T ₁₋₃	5	6	GND
T ₂₋₁	7	8	GND
T ₂₋₂	9	10	GND
T ₂₋₃	11	12	GND
T ₃₋₁	13	14	GND
T ₃₋₂	15	16	GND
T ₃₋₃	17	18	GND
T ₄₋₁	19	20	GND
T ₄₋₂	21	22	GND
T ₄₋₃	23	24	GND
T ₅₋₁	25	26	GND
T ₅₋₂	27	28	GND
T ₅₋₃	29	30	GND
T ₆₋₁	31	32	GND
T ₆₋₂	33	34	GND
T ₆₋₃	35	36	GND
	37	38	GND
	39	40	GND

Connectors J2 (Low voltage distribution):

Pin	Name
1	PWR
2	GND

Connector J3 port 1 - 6 (Proximity sensor Inputs):

Pin	Name
1	T1-
2	T1+
3	T1-
4	T1+
5	T1-
6	T1+

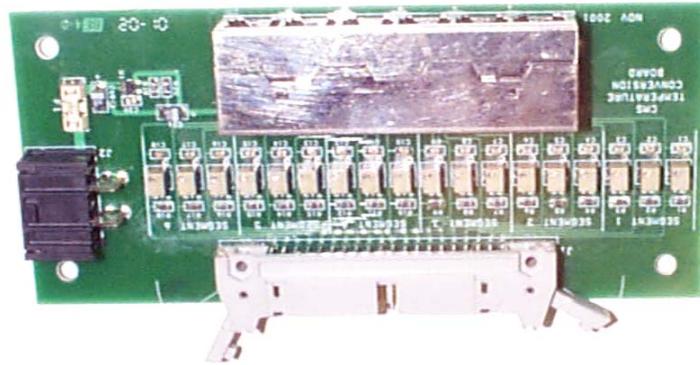


Fig. 1. The temperature conversion board