ENDCAP Alignment

PROXIMITY INTERFACE BOARD

User's Manual

FNAL – PNPI
2003

1. Introduction

The proximity interface board provides a stable 11.3 V voltage for 12 proximity sensors at ME1/3. No control is required for this board.

2. Construction

The proximity interface board has four connectors:

J1   – 6-port RJ11 jack for connection:
              Port 1 – Z1-1 and Z1-2 sensors
              Port 2 – Z2-1 and Z2-2 sensors
              Port 3 – Z3-1 and Z3-2 sensors
              Port 4 – Z4-1 and Z4-2 sensors
              Port 5 – Z5-1 and Z5-2 sensors
              Port 6 – Z6-1 and Z6-2 sensors

J2   – 3M 26-pin header – Output to a voltmeter

J3, J4 – Low voltage distribution connectors Molex Sabre

3. Circuit Diagram

The proximity interface board consists of the low drop output (LDO) voltage regulator and cross-connection circuitry. Voltage regulator is performed in LT1763 U1 integrated circuit with external resistive divider R1, R2 that determines the output voltage as 11.3 V.

4. Functioning

The proximity interface board is a passive device representing a cross-connection board with internal voltage regulator. It works properly if connections are correct.

5. Debugging and Testing

Necessary equipment:
- o Digital voltmeter
- o 12 – 15 V power supply
- o Power cable for analog interface board

Properly manufactured proximity interface boards do not require any adjustment and should work correct at once.

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 proximity interface board under test to the power supply 12 – 15 V and turn on it. Check an input voltage after 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 proximity interface board must be performed before a final assembly.

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 R1 and R2 resistors.
- Check polarity of the C7 and C9 tantalum capacitors (a white band marks a **positive** pad).
- If the previous checks do not discover a reason of failure, replace the U1 LTC1763 integrated circuit.

7.   Specification

General
> Dimensions of the board   6.7" x 2.9"
> Input connector J1   6-port RJ11 jack
> Output connector J2   26-pin 3M header 3429-6002
> Power connectors J3, J4   2-pin Molex Sabre 43160-3102

Power characteristics
> Minimum input voltage   +12 V
> Maximum input voltage   +15 V
> Power consumption   2.1 W (with entire sensor set)
> Current consumption   12 x 11.3 = 135.6 mA
> On board power protection:
>   Fuse   0.5 A
>   LT1763 voltage regulator has overcurrent and overtemperature protection

Specification of connectors

Connector J1 ports 1 - 6 (Proximity Sensor Inputs):

Pin	Name
1	V_{PX1}
2	GND (V_{PX1})
3	V_{PX2}
4	GND (V_{PX2})
5	V_{IN}
6	GND

Output connector J2:

Name	Pin	Pin	Name
V_{PX1-1}	1	2	GND (V_{PX1-1})
V_{PX1-2}	3	4	GND (V_{PX1-2})
V_{PX2-1}	5	6	GND (V_{PX2-1})
V_{PX2-2}	7	8	GND (V_{PX2-2})
V_{PX3-1}	9	10	GND (V_{PX3-1})
V_{PX3-2}	11	12	GND (V_{PX3-2})
V_{PX4-1}	13	14	GND (V_{PX4-1})
V_{PX4-2}	15	16	GND (V_{PX4-2})
V_{PX5-1}	17	18	GND (V_{PX5-1})
V_{PX5-2}	19	20	GND (V_{PX5-2})
V_{PX6-1}	21	22	GND (V_{PX6-1})
V_{PX6-2}	23	24	GND (V_{PX6-2})
V_{IN}	25	26	GND (V_{IN})

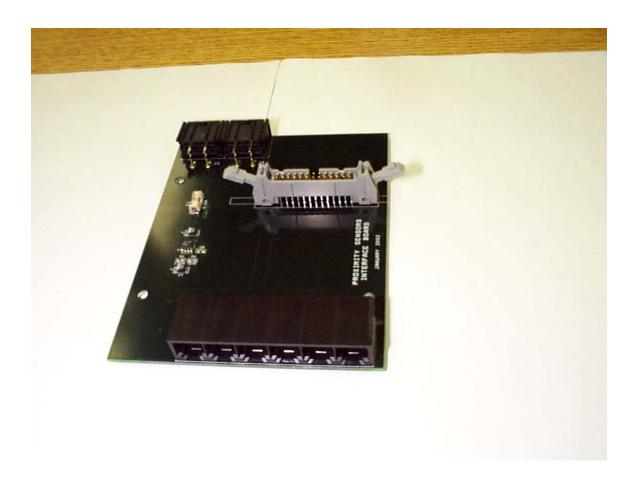Connectors J3, J4 (Low voltage distribution):

Pin	Name
1	PWR
2	GND

Fig. 1. The proximity interface board