



North Sea
Electronics

Product Specification

Product:

Analog Board

Product no.: NSE-500501

REVISION HISTORY

REV	DATE	DESCRIPTION	PREP	CHECK	APPR	COMPANY
00	26.10.12	Initial release	EEN	GLK	GLK	NSE
01	31.10.12	Changed after TI feed-back	EEN	GLK	RFY	NSE
02	30.10.13	Updated to 5005-01 spec	RFY	EEN	RFY	NSE
03	20.12.13	Updated Connector H2	EEN	EHJ	GLK	NSE
04						

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2 Abbreviations

SRS	System Requirement Specification
NSE	North Sea Electronics AS
sps	samples per seconds
Deg	Degrees
C	Celsius
Psi	Pounds per square inch
V	Voltage
kbit/s	Kilobits per second (Kilo = 1000)
GPIO	General Purpose Input and Output

4 Hardware description

4.1 Hardware features

The Analog Board is made to interface with RTD and bridge sensors. It has a high resolution ADC and a variable gain analog front end to maximize flexibility. The board can be directly exposed to pressure, allowing for placement close to sensors. The Analog CAN Node will also monitor 2 digital inputs and internal sensor readings.

- 1 OFF - CAN bus interface
- 2 OFF - 3.3V GPIO
- 1 OFF - RTD input
- 5 OFF - Bridge (2.5V) analog inputs
- 1 OFF - Onboard temperature sensor
- 1 OFF - Input voltage measurement
- 1 OFF - Input current measurement

4.2 Analog front end

The board have input for:

- 1 RTD PT1000 sensor
- 5 Differential bridge sensors (typically strain gauge or pressure sensors)

Bridge excitation voltage is 2.5V. Bridge input common mode range is 2.5V when input gain is 1. The ADC input gain is configurable to be 1, 2, 4, 8, 16, 32, 64 or 128 for the bridge inputs. The default gain is set to 128 in firmware. The RTD sensor input is default configured as a PT1000, but can be firmware configured to be PT100.

4.3 Integrated Sensors

4.3.1 Temperature sensor

Temperature will be acquired and distributed on request.

The temperature sensor measurements shall be within $\pm 2\%$ of the ambient temperature (from 0 degC to 150 degC). The temperature sensor can measure up to 180 degC.

4.3.2 Voltage measurement

Board input voltage will be acquired and distributed on request.

The board input voltage measurements shall be within $\pm 3\%$ of the ambient temperature (from 0degC to 150 degC).

4.3.3 Current measurement

Board current consumption will be acquired and distributed on request.

The board current consumption measurements shall be within $\pm 5\%$ of the ambient temperature (from 0degC to 150degC).

4.4 General Purpose IO (GPIO)

The 2 GPIO pins shall be configurable to be either inputs or outputs. GPIO pins are routed directly into the microcontroller and have 10k pull up resistors and zener protection. The GPIO pins are 3.3V tolerant.

4.5 CAN bus interface

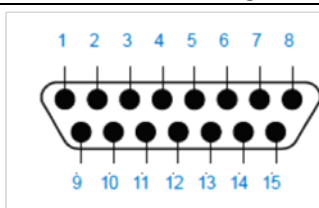
The board has CAN bus interface for communication. If the Analog CAN Node is located at the end of the bus, the CANBUS needs to be terminated with a 120Ω as defined by the CANBUS standard.

5 Connector pin-out

5.1 15 pin connector H1

The 15 pin connector (H1) is a Glenair MIL-DTL-83513/10-B01NW.

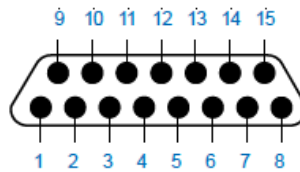
Pin Number	Signal name	Description
1	GPIO2	General Purpose Digital Pin 2
2	RTD-	RTD Return
3	RTD+	RTD Supply
4	+2V5EXT	+ Input Spare Bridge
5	CH3-	Channel 1 Negative Input
6	CH3+	Channel 3 Positive Input
7	AGND	Analog Ground
8	+2V5EXT	+2. 5V Bridge Supply Voltage
9	CH4-	Channel 4 Negative Input
10	CH4+	Channel 4 Positive Input
11	AGND	Analog Ground
12	+2V5EXT	+2. 5V Bridge Supply Voltage
13	CH5-	Channel 5 Negative Input
14	CH5+	Channel 5 Positive Input
15	AGND	Analog Ground



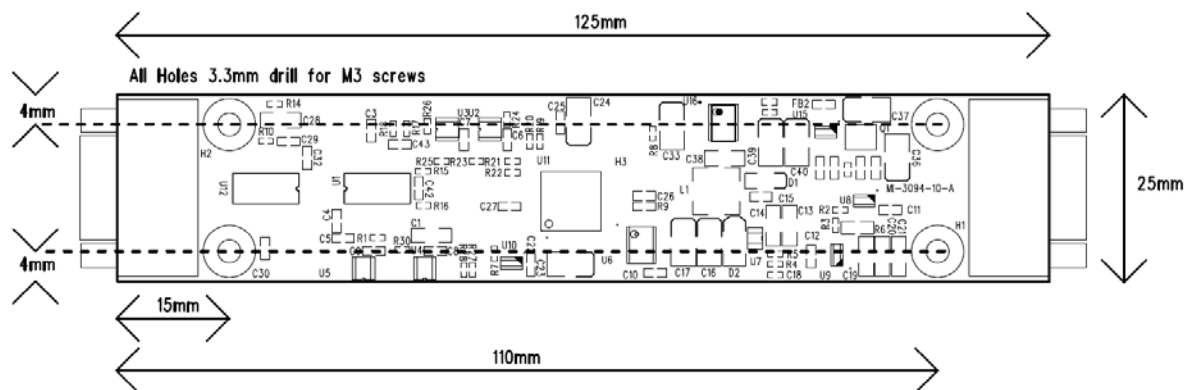
5.2 15 pin connector H2

The 15 pin connector (H2) is a Glenair MIL-DTL-83513/13-B01NW.

Pin Number	Signal name	Description
1	+2V5EXT	+2. 5V Bridge Supply Voltage
2	CH1-	Channel 1 Negative Input
3	CH1+	Channel 1 Positive Input
4	AGND	Analog Ground
5	CH2-	Channel 2 Negative Input
6	CH2+	Channel 2 Positive Input
7	GND	GROUND
8	+24Vin	Supply Voltage 24-30V nominal
9	GND	GROUND
10	CANL/+2V5EXT	CANL default/+2. 5V Bridge Supply Voltage Optional
11	CANL	CAN low
12	CANH/AGND	CANH Default/Analog Ground optional
13	GPIO1	General Purpose Digital Pin 1
14	CANH	CAN high
15	+24Vin	Supply Voltage 24-30V nominal



6 Mechanical Dimensions



The Board size is 125mm * 25mm excluding connectors. The 4 drill holes for M3 screws are located according to the figure above. The board height is 11mm.