Features

- Highly versatile processor board for downhole or other demanding applications
- 2 x Analog differential inputs with programmable gain
- CANBus communication interface
- 1 x Open Drain output
- 2Mbit HT FRAM memory (default)
- 64Mbit HT Flash memory (option)
- 3 axis accelerometer
- 18-48Vdc Input voltage range
- CNC Machined aluminum housing

Product Description

The DL100 Data Logger is a tiny, high temperature processor and logging board. Despite its small size, it features two analog bridge sensor interfaces, RTD interface, on-board accelerometer and flash memory for data logging.

Due to its small size, rugged construction and wide input voltage range, the DL100 can be set up to monitor and control a wide range of application. DL100 is optimized for low power consumption. NSE can provide the data logger with customer specified firmware and can assist if the customer want to create its own tool specific firmware.

Revision History

REV	DATE	DESCRIPTION	PREP	APPR
A	21.08.2019	Initial Revision	RFY	GLK
B	05.11.2019	Connectors changed, mechanical drawings	EEN	RFY
C	02.06.2020	Correction of errors, mechanical dimensions in table	AJA	RFY
D	26.01.2022	2Mbit FRAM as default memory. New product picture.	AJA	GLK

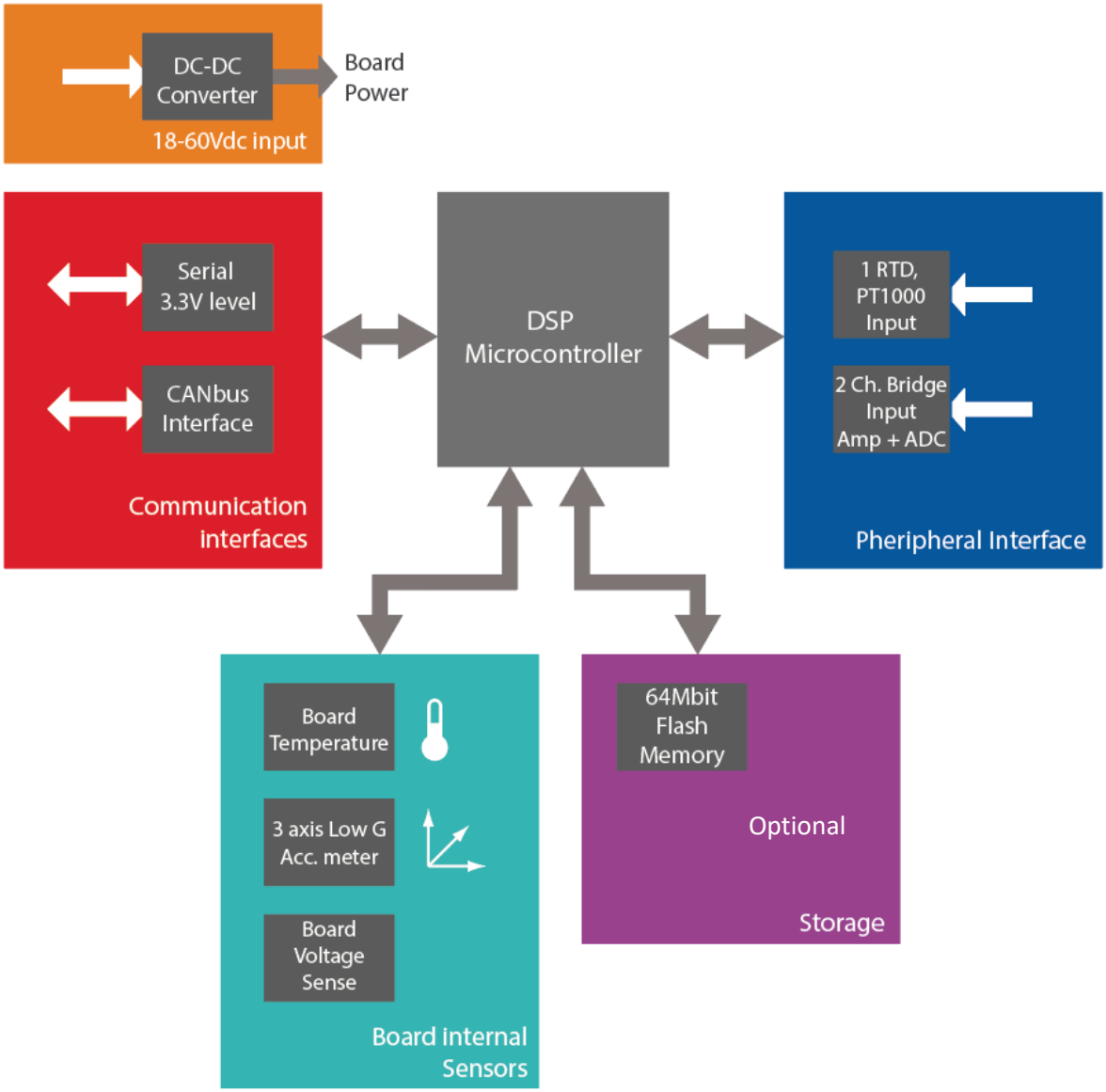
1 Board Overview

The NSE HT DL100 Processor Board features a DSP Microcontroller paired with an accurate high temperature oscillator. This is a proven solution from NSE and has been tested and verified in several designs that are in operation worldwide.

All peripherals are connected to the controller through dedicated IO pins, communication buses or SPI.

The combination of a proven design layout, good support, extensive documentation and base driver firmware for all IO functions allow for rapid development of applications and algorithms.

1.1 Board block diagram



2 Board Specifications

	Min	Typ	Max	Unit
Physical size				
Length PCB		*74*		*mm (excluding connectors)*
Width PCB		*20*		*mm*
Length chassis		*98*		*mm*
Width chassis		*23*		*mm*
Height chassis		*12.10*		*mm*
Environmental				
Operating Temperature	0		177	*°C*
Storage Temperature	-40		60	*°C*
Power				
Voltage supply	18		48	*Vdc*
Supply Input Current	< 1			*mA (depending on application and fw)*
Integrated sensors				
Onboard temperature sensor range	0		190	*°C*
Temperature sensor error			±3	*°C*
Input voltage measurement range	15		70	*Volt*
Input voltage measurement error			± 3	*%*
Input Current measurement range	0		60	*mA – excluding solenoid output*
Input Current measurement error			± 5	*% of full scale output*
On board logic voltage		3.3		*Volt*
Logic voltage measurement error			± 3	*%*
Bridge excitation voltage		2.5		*Volt*
Bridge voltage measurement error			± 3	*%*
Accelerometer axis		3		*X, Y, Z (optional)*
Accelerometer range	-2		2	*G (optional)*
Accelerometer measurement error				*To be determined*
Accelerometer temperature range	0		150	*°C*
Onboard Memory				
FRAM (Default)		2		*Mbit*
Flash (Option)		64		*Mbit*
Analog input				
RTD channels		1		*2-Wire PT1000*
RTD Temperature range	0		360	*°C*
Wheatstone bridge input channels		2		*Differential input*
Bridge input gain	1		128	
Bridge resistance	100			*Ohms*
Bridge excitation voltage		2.5		*Volts*
ADC resolution			24	*Bits*
Sampling rate			7	*Samples per sec*

Solenoid Output		
Channels	1	
Solenoid Output voltage	Board Input Voltage	
Current rating	0.5	A
Current measurement error	± 5	*% of full scale output*
Communication		
CAN bus channels	1	
CAN bus default baud rate	250	kbps
Connectors		
H1	891-008-9PA2-BRT	COM / Power (9 pin)
H2	891-008-15PA2-BRT	Analog Input (15 pin)

2.1 Thermal properties

The NSE High Temperature DL100 is designed to operate in a 177°C environment.

In a typical assembly, the **NSE UNIT** is mounted to a **MOUNTING PROFILE** that is located inside an **OUTER HOUSING**.

The **OUTER HOUSING** surface temperature should not rise above the specified maximum ambient temperature, and the mechanical design and interface between the **OUTER HOUSING, MOUNTING PROFILE** and the **NSE UNIT** should be such that the thermal resistance specification is achieved.

2.2 Connectors

2.2.1 H1 communication and power

DL100 Connector: 891-008-9PA2-BRT
Mating connector: 891-002-9SA2-0B7-12J-MC273

Pin	Signal name	Description / Function
1	+VIN	Supply voltage input – diode connected with +BATT. High-side supply to Open Drain
2	+VIN	Supply voltage input – diode connected with +BATT. High-side supply to Open Drain
3	GND	Ground
4	GND	Ground
5	GND	Ground
6	CANH	CAN High - CAN bus
7	CANL	CAN Low - CAN bus
8	Open Drain	Open Drain Output – Current Sink
9	+VBATT	Supply voltage input – diode connected with +VIN

2.2.2 H1 Pin assignment

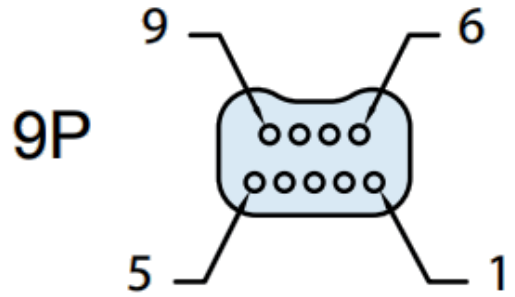


Illustration show face view of connector on the DL100 board (Looking in to the connector).

2.3 H2 – Analog input

DL100 Connector: 891-008-15PA2-BRT
Mating connector: 891-002-15SA2-0B7-12J-MC273

Pin Number	Signal name	Description
1	RES	RESERVED PIN – DO NOT CONNECT
2	GPIO2	GPIO Ch2 – 2.5V - V_{LO}<0.5V, V_{HI}>1.75V
3	GPIO3	GPIO Ch3 – 2.5V - V_{LO}<0.5V, V_{HI}>1.75V
4	GND	GROUND
5	GND	GROUND
6	+2.5V	Bridge Excitation Voltage – 2.5V
7	Bridge2+	Differential Input Channel 2+
8	Bridge2-	Differential Input Channel 2-
9	GND	GROUND
10	+2.5V	Bridge Excitation Voltage – 2.5V
11	Bridge2+	Differential Input Channel 2+
12	Bridge2-	Differential Input Channel 2-
13	GND	GROUND
14	RTD1+	RTD channel 1+
15	RTD1-	RTD channel 1-

2.3.1 H2 Pin assignment

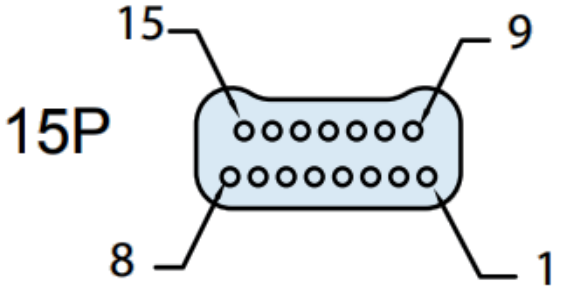
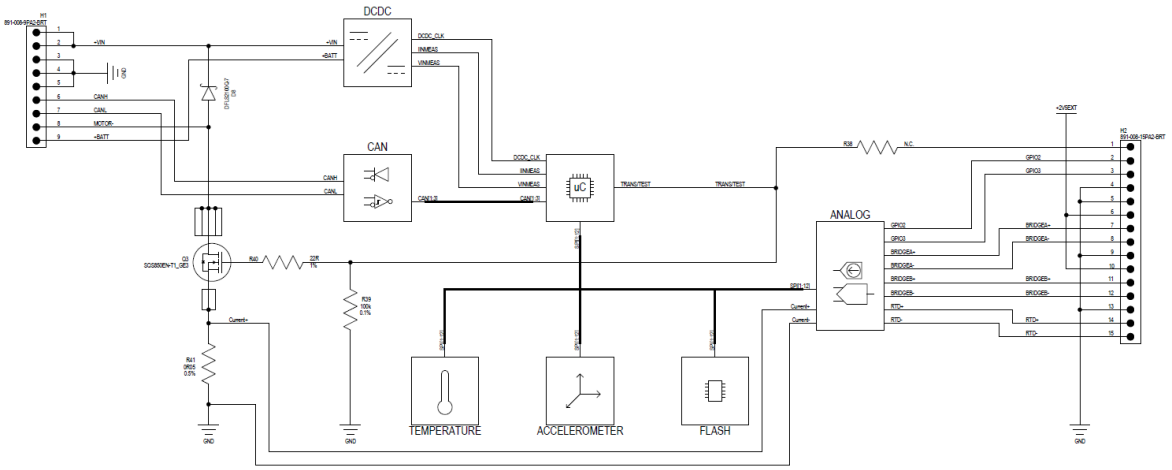


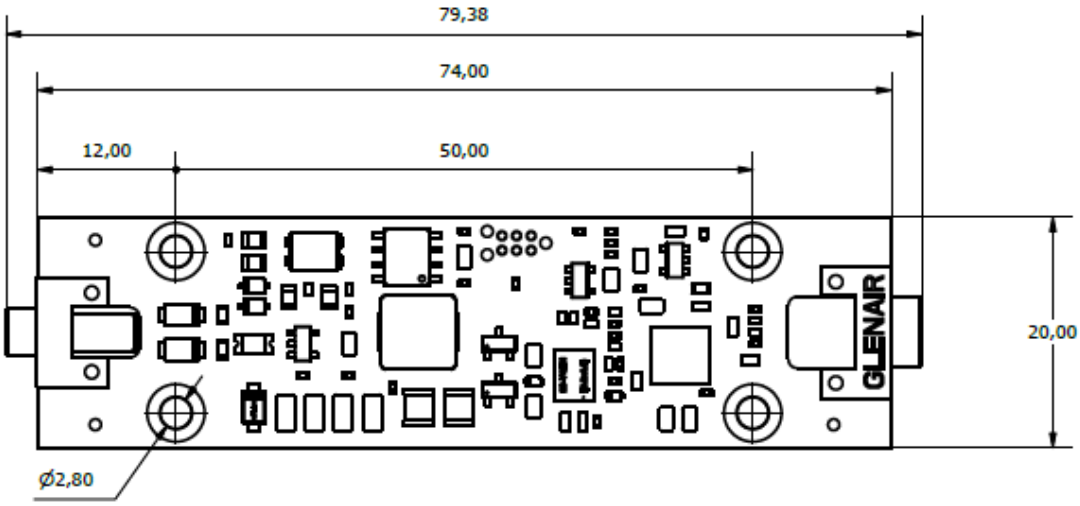
Illustration show face view of connector on the DL100 board (Looking in to the connector).

3 Block diagram

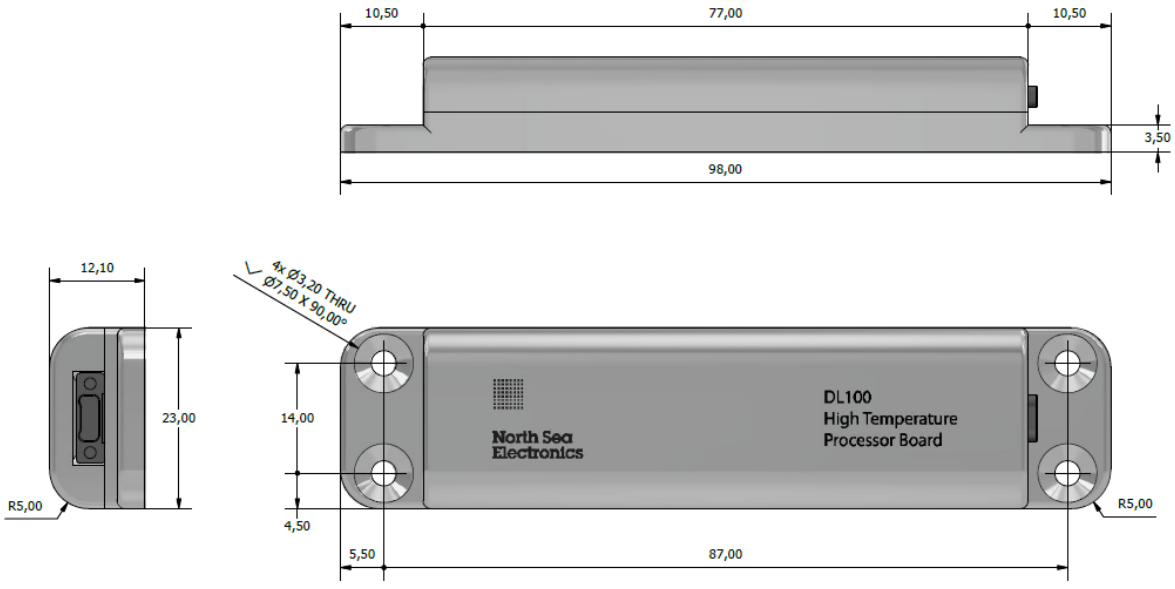


4 Mechanical Dimensions

4.1 Bare Board



4.2 With Chassis



Consult NSE for 3D step model of chassis.