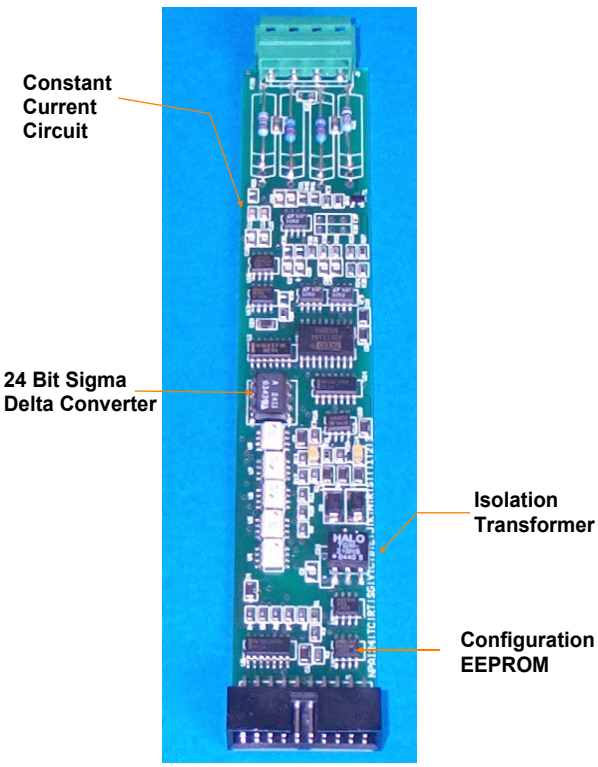
NetPod 4000

Process Measurement Solutions

Resistance Temperature Detector (RTD) Interface Cards

4 Wire RTD with Constant Current Excitation

Constant Current Excitation
277 µA Drive Current - Minimised Sensor Self Heating
24 bit & 16 Bit ADC Resolution Options
Individual ADC/card
4 Wire RTD Sensor Support - PT100
-200 to 800 Deg °C Measurement Range
Sigma Delta ADC Conversion
Inbuilt Signal Conditioning
1000V DC Opto-isolation (Higher levels upon request)



The NetPod 4000 series instruments can be used for high precision temperature readings when fitted with a range of RTD sensor interface cards. Optional interfaces are available supporting both 24 bit and 16 bit ADC resolution converters offering the optimum in high resolution, high dynamic range and low noise measurements. The RTD interface can be used along side any other sensor input card when creating general purpose instrumentation solutions.

All of the ranges of RTD interface cards support direct connection to the 4 wire sensors and Figure 2 shows how for a 4 wire sensor connection is made to the interface.

High precision measurements are made using the 4 wire PT100 family of sensors and when operating with the constant current sensor excitation the sensor cabling effects are removed from the readings. The RTD/ PT100 sensors can be deployed a substantial distance away from the interface card without degrading any measurements. Several hundred meters can be achieved from the sensor to the Interface card without loss in performance of the RTD interfaces. Most different manufacturers sensors for different applications are supported.

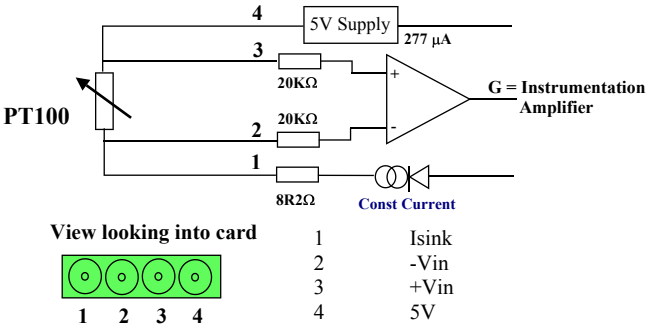


Figure 2 shows the 4 Wire RTD Sensor Connection to the Interface Cards

Part Number	Description
NPAI24-RTDA	24 Bit RTD Type A
NPAI24-RTDB	24 Bit RTD Type B
NPAI16-RTDA	16 Bit RTD Type A
NPAI16-RTDB	16 Bit RTD Type B

Accuracy in measurement over a wide temperature range is a crucial factor in temperature measurements. The Keynes Controls RTD interfaces are unequaled in performance. Stability over long periods of continued use makes them unmatched in reliability. Precision construction make them highly interchangeable for easy replacement without need for re-calibration.

Specifications

Table 1

ADC Resolution	Options for 24 & 16 Bit Sigma Delta
CMMR	160 dB
Current Source Drive Current	5V voltage with 277 uA excitation current
Drift	10.0 ppm/**°C**
Sensor Interface	4 & 3 wire RTD (PT100)
Measurement Range	- 200 to + 600 Deg C (Standard) -200 to + 800 Deg C (Optional)
Operating Temperature	-20 to 60 Deg C
Short Circuit Current Limit	277 uA max
sample Rate	1- 1KHz/channel
Isolation	1000V DC Standard 3000V DC upon request
Dynamic Response	Sinc Filter
Load Regulation	< 0.005%
Linearity	± 0.05 worst case

PLATINUM RESISTANCE ELEMENTS
DEVIATION FROM CALIBRATION VALUES

Temperature			Deviation Degrees		Temperature			Deviation Degrees	
°C	°F	Ohms	°C	°F	°C	°F	Ohms	°C	°F
-200	-328	± 0.56	± 1.3	± 2.34	400	752	± 0.79	± 2.3	± 4.14
-100	-148	± 0.32	± 0.8	± 1.44	500	932	± 0.93	± 2.8	± 5.04
0	32	± 0.12	± 0.3	± 0.54	600	1112	± 1.06	± 3.3	± 5.94
100	212	± 0.30	± 0.8	± 1.44	700	1292	± 1.17	± 3.86	± 6.84
200	392	± 0.48	± 1.3	± 2.34	800	1472	± 1.28	± 4.3	± 7.74
300	572	± 0.64	± 1.8	± 3.24	850	1562	± 1.34	± 4.6	± 8.28

Table 2

Table 2 shows the deviation from the results expected by the use of the PT100 resistive temperature detector for general purpose temperature mesurements.

Typical Noise Figures - PT100 Sensor

Sample Rate	Noise Peak-Peak	Noise RMS
1	0.0227 °C	0.0027 °C
10	0.0377 °C	0.0060 °C
100	0.0980 °C	0.0112 °C
1KHz	0.2919 °C	0.0414 °C