

# PCIe/PXle-6301 Series

## 24 bits Temperature Input Module for Resistance Temperature Detector



🔗 Please download the [<JYTEK PalmInfo Products>](#), you can quickly inquire the product prices, the key features and available accessories..

### Overview

This chapter presents the information how to use this manual and how to operate the module if you are already familiar with Microsoft Visual Studio and C# programming language.

### Main Features

- 32 channels (3-wire mode), 20 channels (4-wire mode)
- 24 bits ADC resolution
- -200 °C--+850 °C temperature measurement range (using PT100 thermistor sensor)
- 0 ~ 400  $\Omega$  range
- The balance line resistance compensation is provided when the three wire thermal resistance sensor is input
- 128M sample onboard FIFO buffer for analog input
- DMA for analog input
- Provide resistance or temperature measurement value
- Analog/Digital/Software Trigger

## Hardware Specifications

### Analog Input Specifications

Number of channels	32ch (2-wire/3-wire)
	20ch (2-wire/3-wire/4-wire)
Synchronous acquisition	No
Sensor support	RTD PT100
ADC resolution	24 bit
ADC type	$\Delta$ - $\Sigma$
Input isolation	Yes
Sampling rate	800 Sample/s MAX(4 channels)
	160 Sample/s (2-wire/3-wire/4-wire, 20ch fully used)
	100 Sample/s (2-wire/3-wire, 32ch fully used)
Clock	Onboard
Storage depth	128M Samples
Measuring range	0 $\Omega$ – 400 $\Omega$ / -200 $^{\circ}$ C - +850 $^{\circ}$ C(for PT100)
Terminal type	2-wire/3-wire/4-wire
Excitation current	1000 $\mu$ A (4-wire)
	500 $\mu$ A (2-wire/3-wire)
Overvoltage protection	$\pm$ 30 V
Trigger type	Analog/Digital/Software
Analog trigger range	0 $\Omega$ – 400 $\Omega$ / -200 $^{\circ}$ C - +850 $^{\circ}$ C(for PT100)
Trigger mode	StartTrigger, ReferenceTrigger, ReTrigger

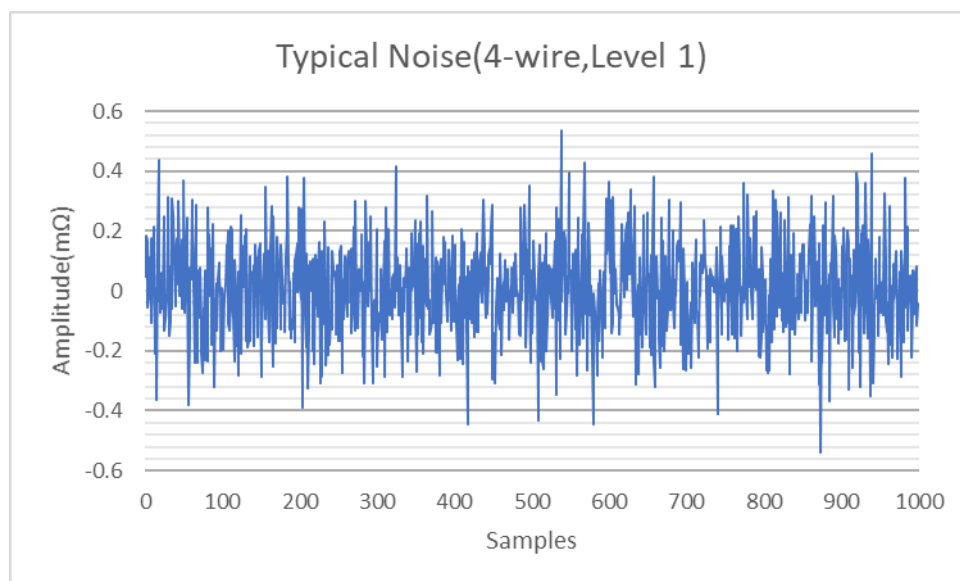
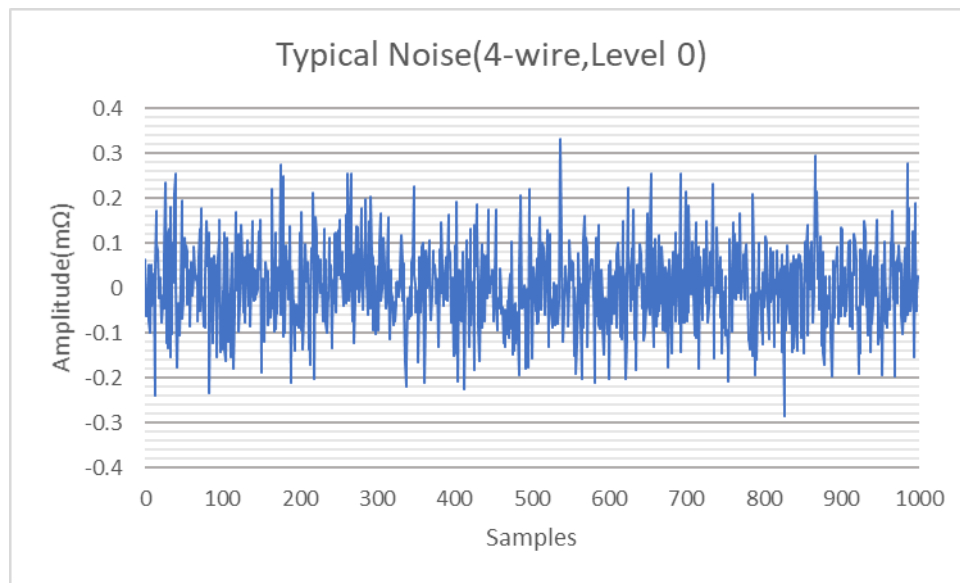
### PFI

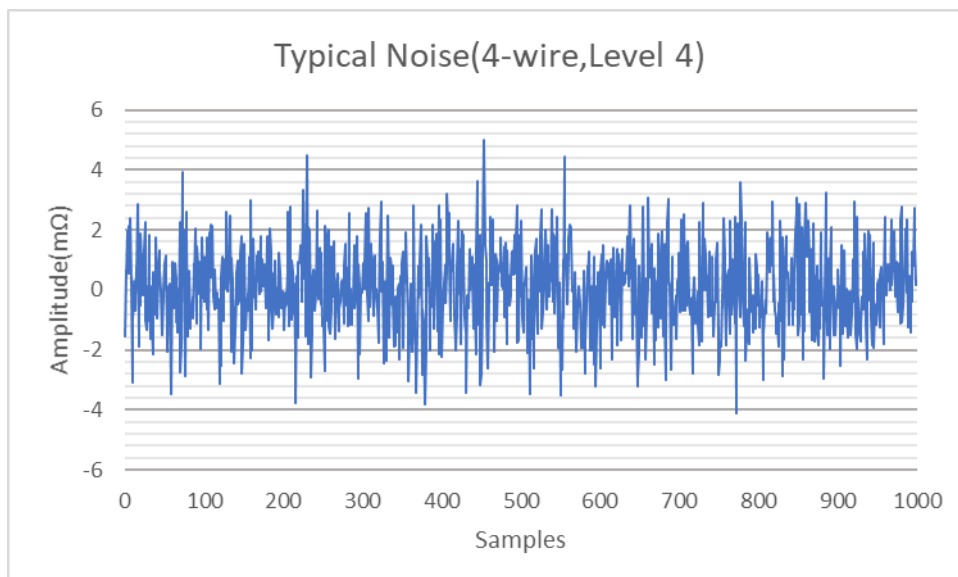
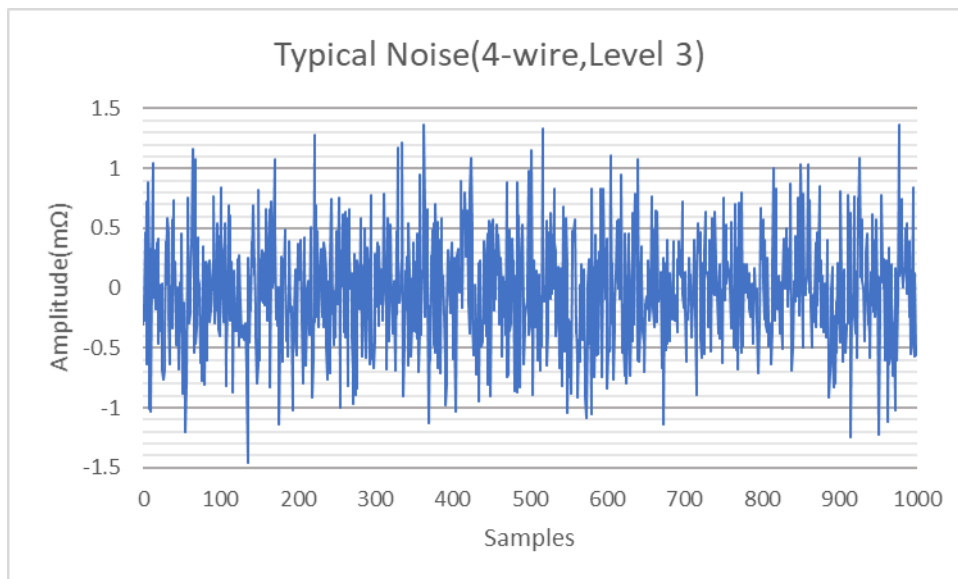
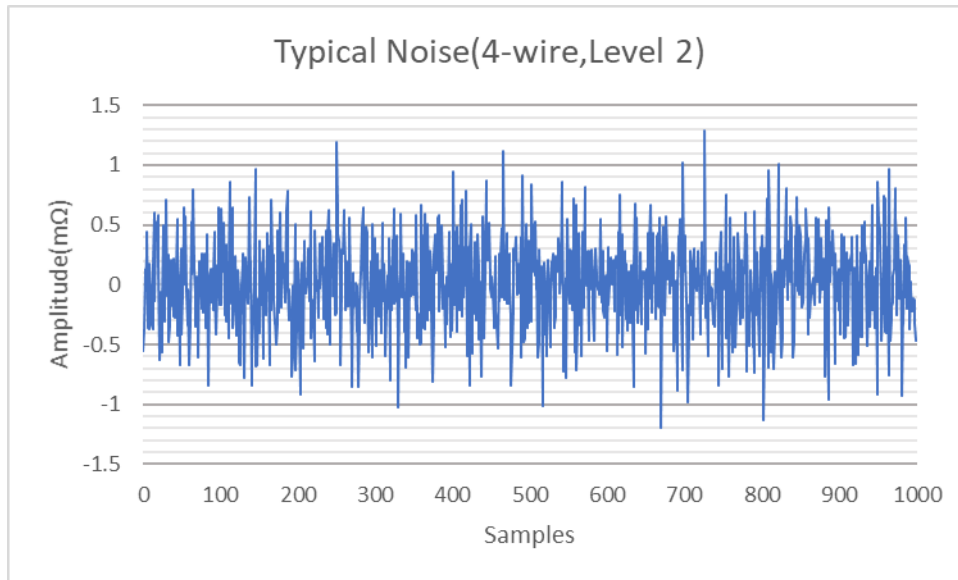
Number of channels	8, 4 of them have hardware pull-ups
External digital trigger interface	Trigger voltage: 5 V TTL
	Trigger edge: Rising /Falling
Initial state	Input*
<i>6301's PFI is only used for external digital triggering, cannot be configured as output</i>	

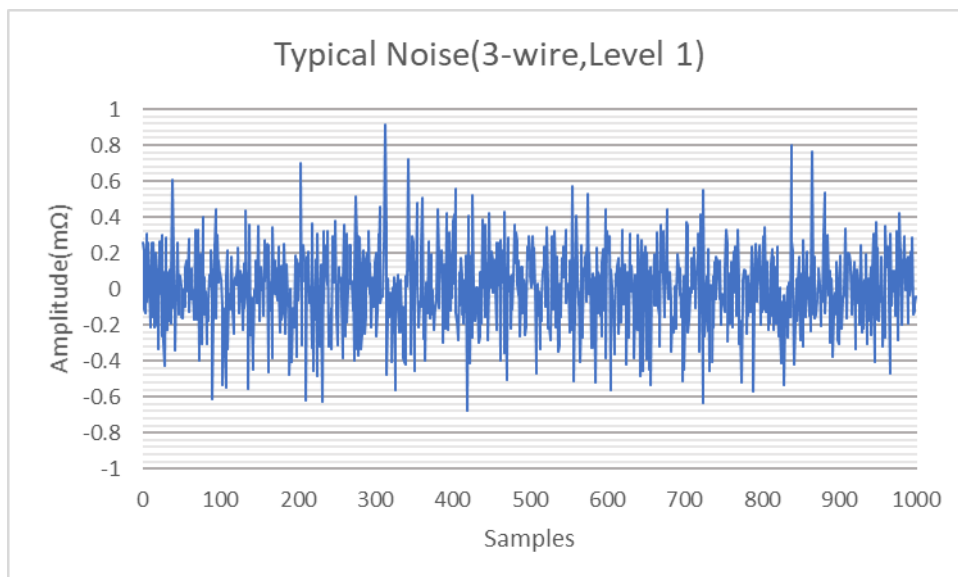
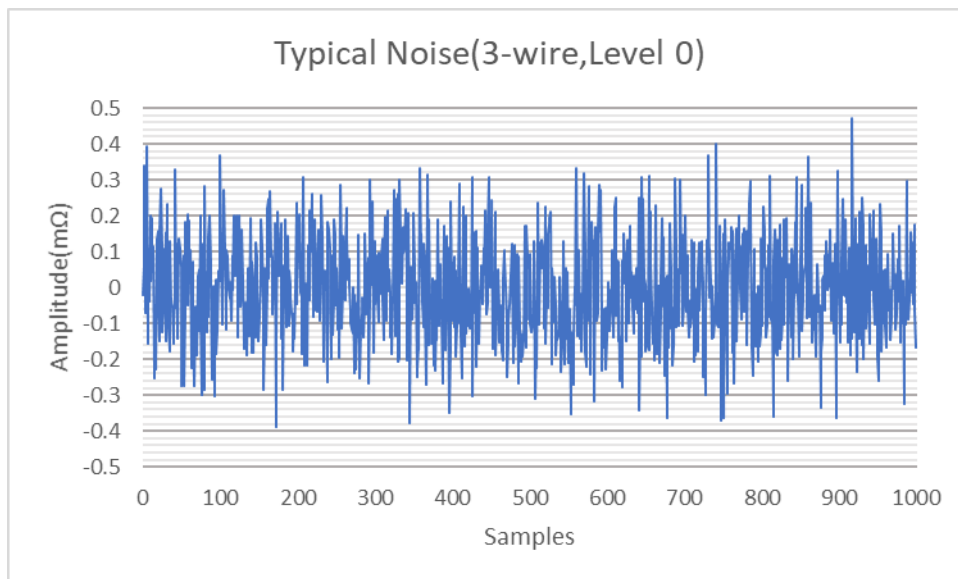
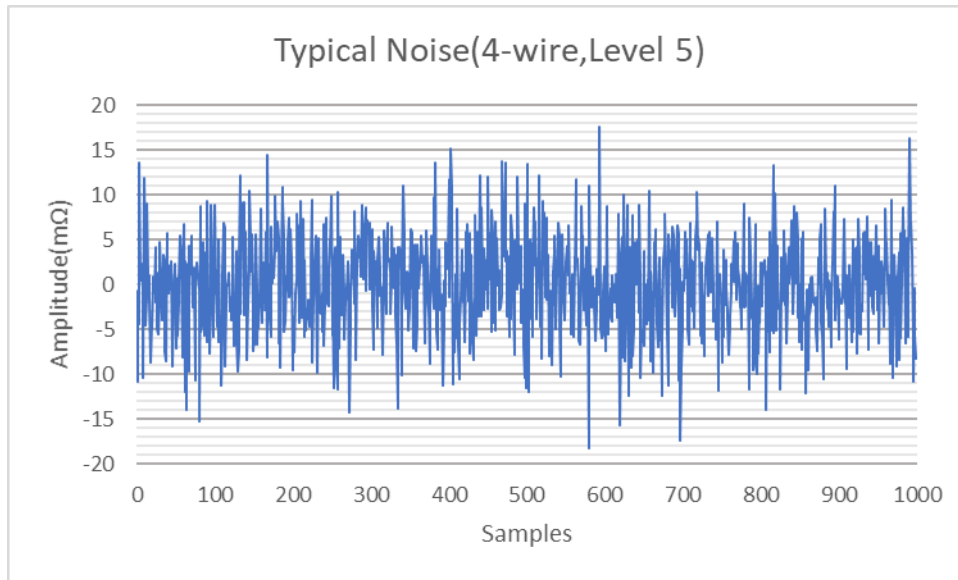
## Performance Test

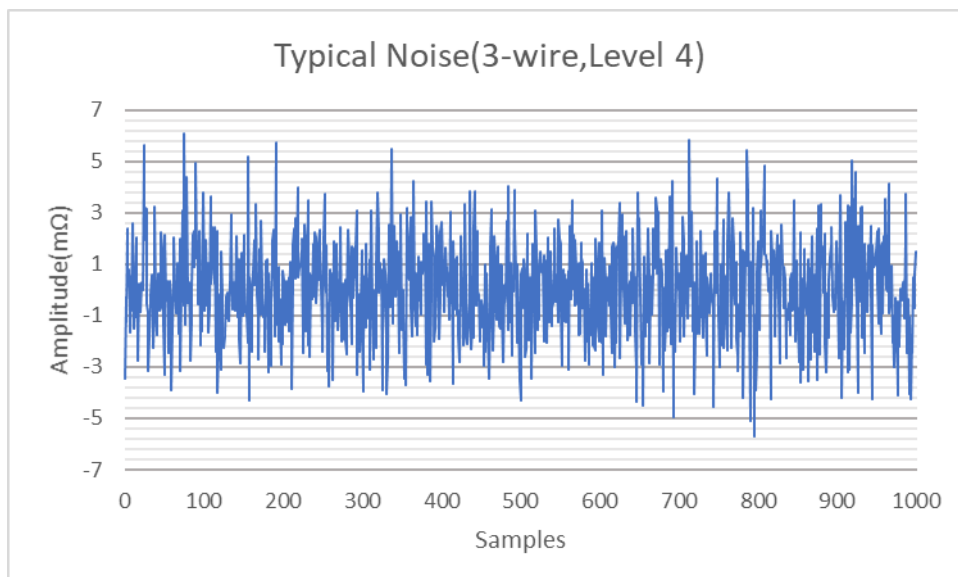
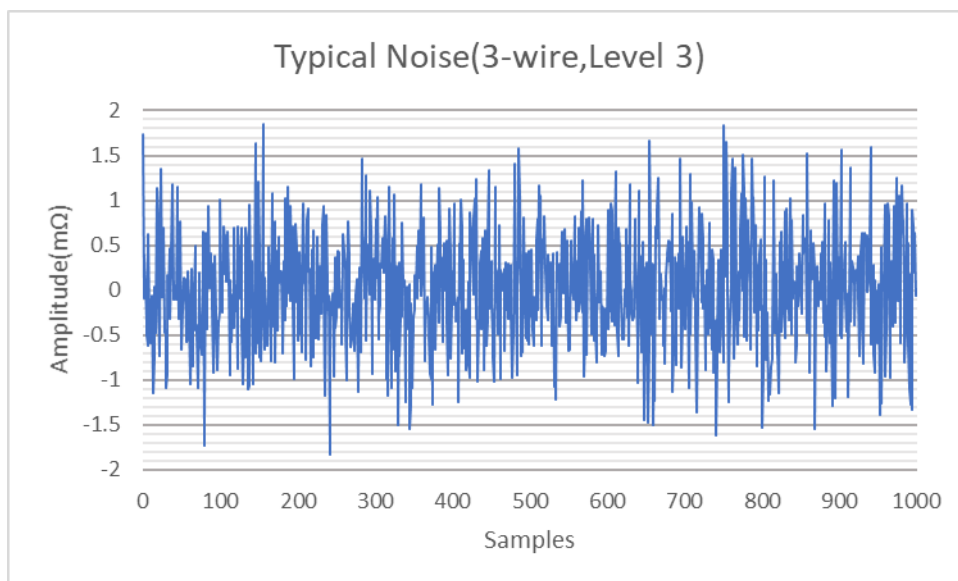
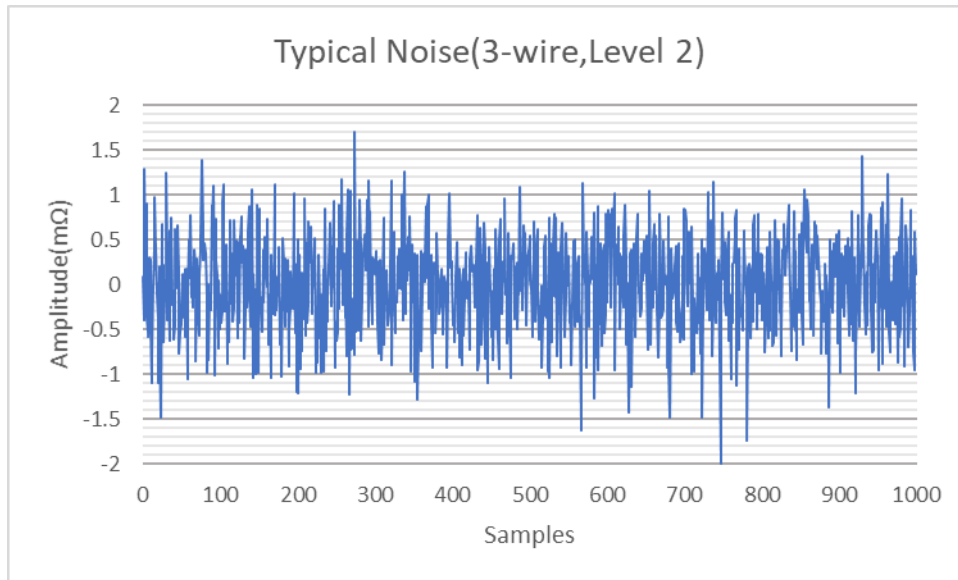
### Resistance measurement noise

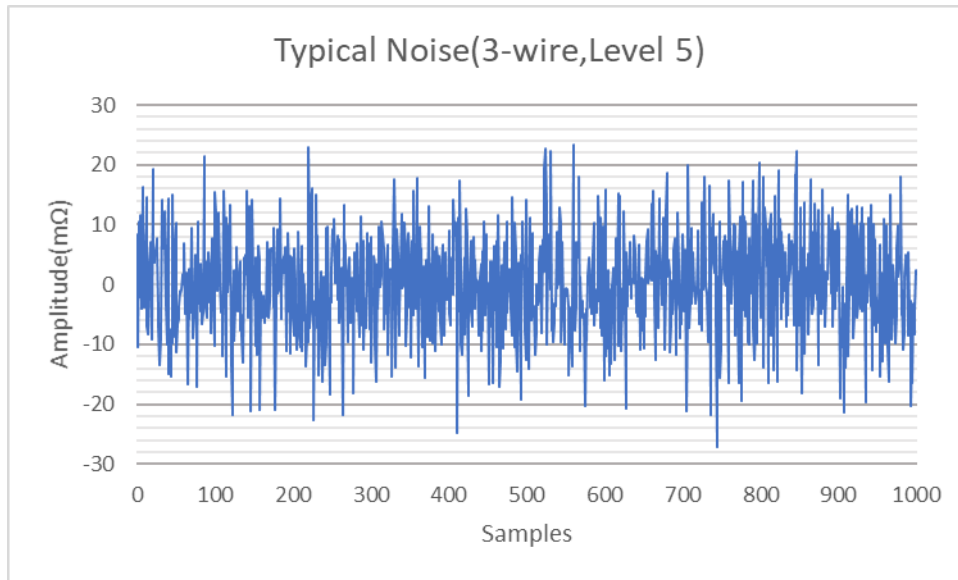
Timing mode	Noise(2-wire/3-wire)(RMS)	Noise(4-wire) (RMS)
Level 0	0.35 mΩ	0.18 mΩ
Level 1	0.45 mΩ	0.24 mΩ
Level 2	0.65 mΩ	0.5 mΩ
Level 3	0.68 mΩ	0.6 mΩ
Level 4	2.1 mΩ	1.8 mΩ
Level 5	10.5 mΩ	6.6 mΩ







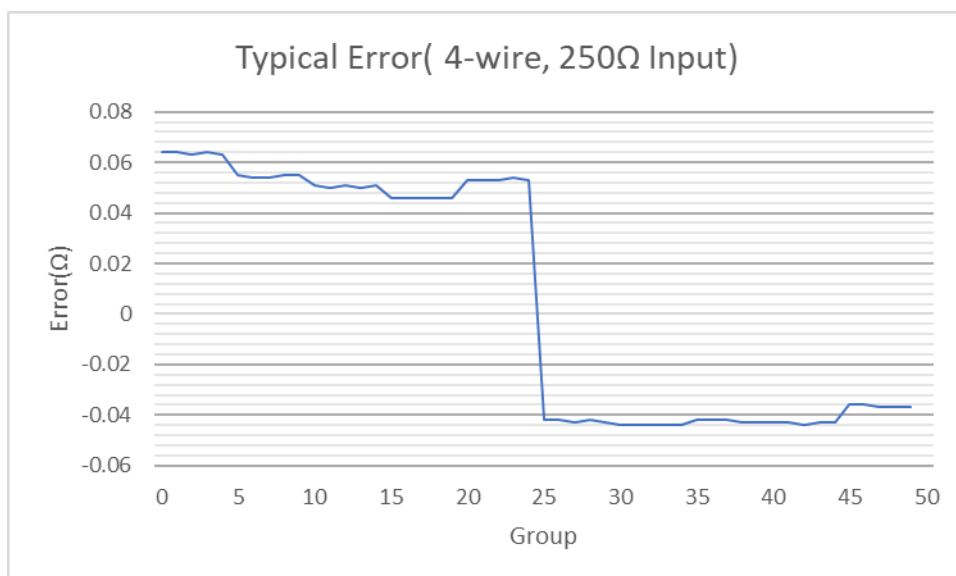
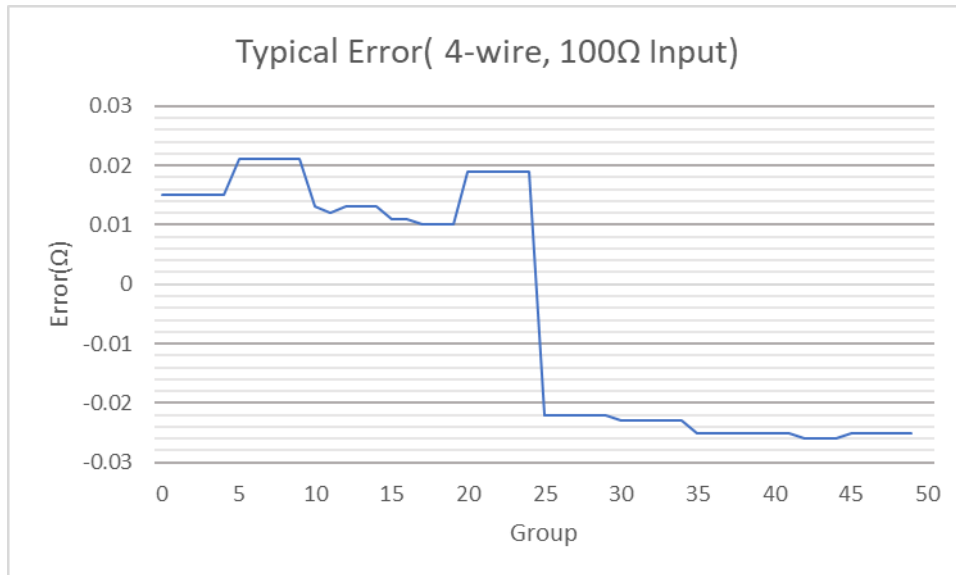




## Temperature measurement accuracy

### Temperature measurement accuracy (4-wire)

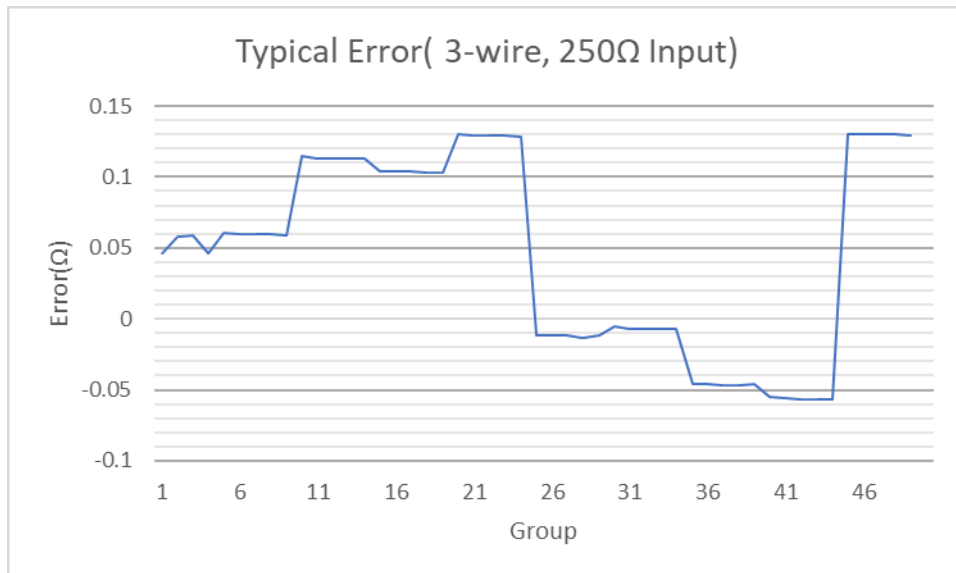
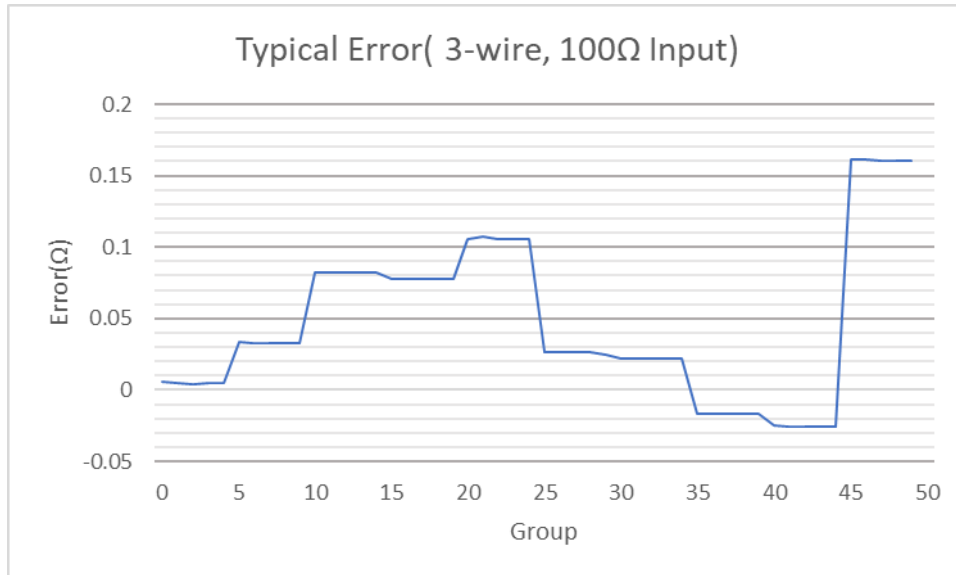
Test condition	-100 °C - +100 °C	-200 °C - +850 °C
25 °C, typical	0.054 °C	0.136 °C
25 °C, typical	0.096 °C	0.201 °C
0-55 °C, max	0.146 °C	0.301 °C





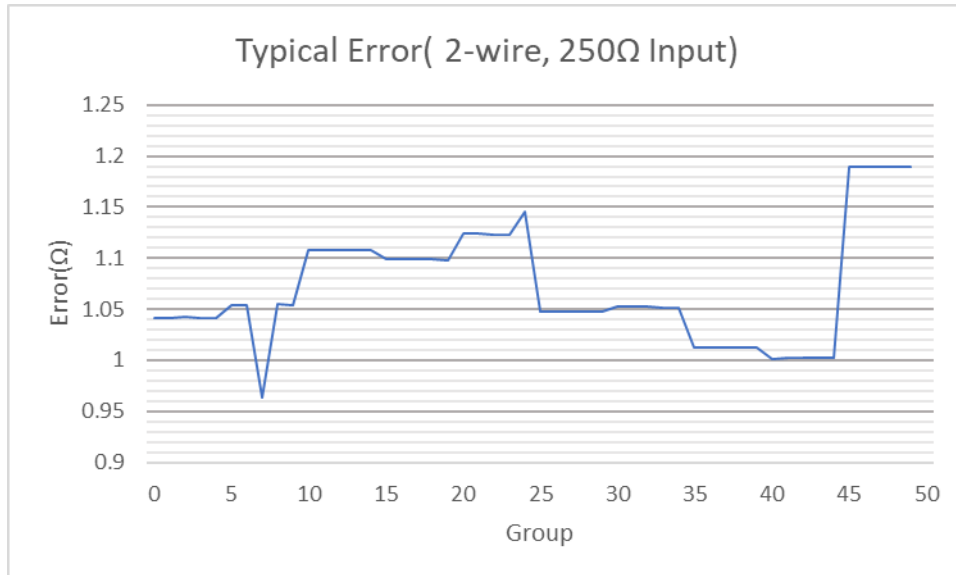
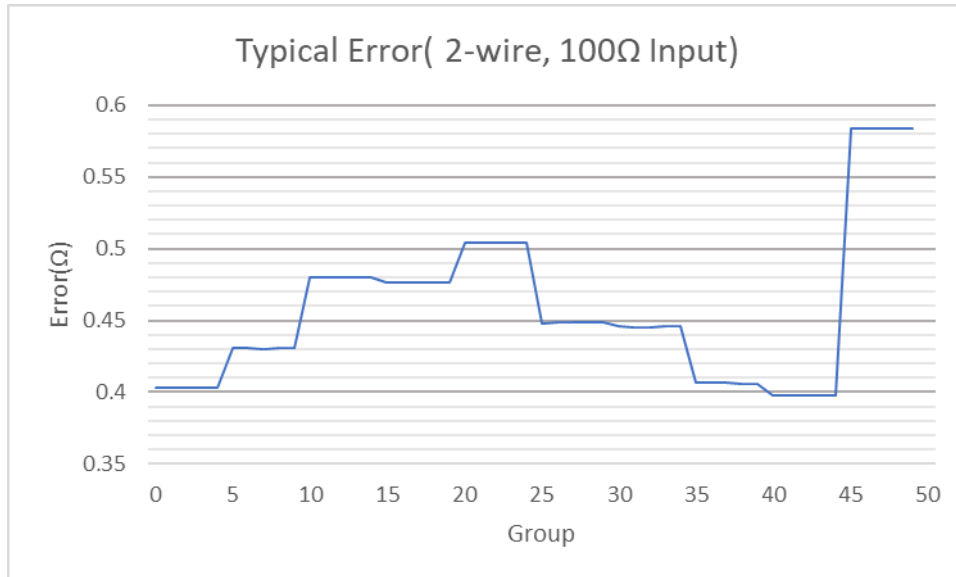
### Temperature measurement accuracy (3-wire)

Test condition	-100 °C - +100 °C	-200 °C - +850 °C
25 °C, typical	0.15 °C	0.203 °C
25 °C, max	0.536 °C	0.576 °C
0-55 °C, max	0.586 °C	0.676 °C



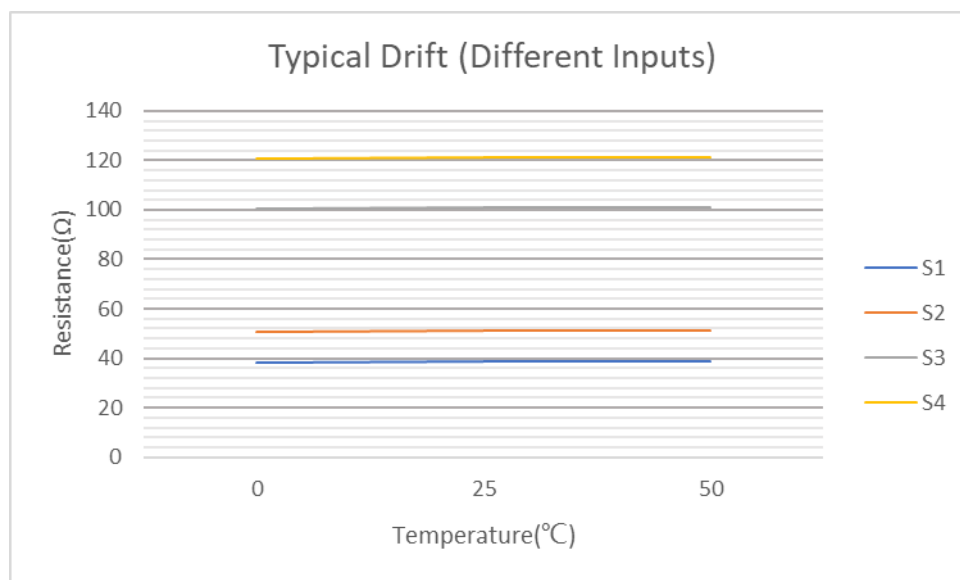
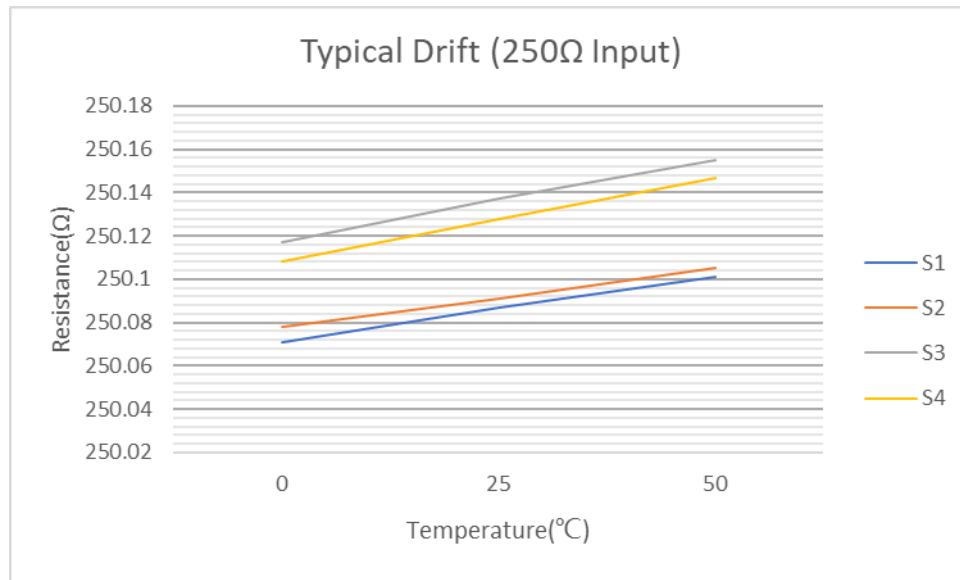
### Temperature measurement accuracy (2-wire)

Test condition	-100 °C - +100 °C	-200 °C - +850 °C
25 °C, typical	1.237 °C	3.061 °C
25 °C, max	1.678 °C	3.55 °C
0-55 °C, max	1.788 °C	3.75 °C



### Temperature measurement stability

	Typical value	Max value
Offset error stability	280 $\mu\Omega/^\circ\text{C}$	800 $\mu\Omega/^\circ\text{C}$
Gain error stability	2.72 ppm	3.2 ppm



### RDC (Resistance-digital conversion) accuracy

	Typical value	Max value
Offset error(25 ± 5 °C)	1.40 mΩ	12.4 mΩ
Offset error(0-50 °C)	8.40 mΩ	32.4 mΩ
Gain error(25 ± 5 °C)	0.000185	0.000231
Gain error(0-50 °C)	0.000253	0.000311

## Order Information

- PXIe-6301 (PN: JY2016301-01)  
32-ch 24-Bit PXIe Temperature input card for RTD
- PCIe-6301 (PN: JY2116301-01)  
32-ch 24-bit PCIe Temperature input card for RTD

## Accessories

- DIN-68S-01 (PN: JA9114029-01)  
SCSI 68-pin Terminal board w/o cable
- ACL-2016868-2 (PN: JY2016868-02)  
2M 68pin VHDCI68M-SCSI68M 100Ω shielded cable

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