USB/PCIe/PXIe-6302 Series

High Accuracy 24 bits High-Resolution Thermocouple Input Module

Please download JYTEK <JYPEDIA>, you can quickly inquire the product prices, the key features and available accessories.

Overview

USB/PCIe/PXIe-6302 Series is a high-precision, high-resolution voltage and temperature measurement module. It provides up to 32 channels of measurements and supports R/S/B/J/T/E/K/N/C/A types of thermocouples, with input voltage range of ±78.125 mV and sample rate up to 800 Samples/sec. JY6302 has both PCIe and PXIe version.

USB-6301 Series only supports USB 3.0 bus protocol or above.

Main Features

- Up to 450 ppm full scale accuracy
- 32 channels of measurements
- Voltage range supported: ±78.125 mV
- Support R/S/B/J/T/E/K/N/C/A types of thermocouples
- 8 cold-junction compensation channels provided by 2 TB-68CJ terminal blocks
- Open Thermocouple Detection (OTD)
- Onboard 128M sample FIFO buffer for analog input
- DMA for analog input
- 24 bits resolution
- Provide voltage (EMF value) to temperature (°C) conversion specified by the standards
- Digital and Software Trigger

Specifications

Input Characteristics

Basic

Number of channels	32 channels
ADC resolution	24 bits
Type of ADC	Δ-Σ
Sensor support	R/S/B/J/T/E/K/N/C/A thermocouple
Sampling mode:	Scanned
Sampling rate	800 Samples/s MAX (4 channels)
	100 Samples/s (all 32 channels)
Voltage measurement range	±78.125 mV
Temperature measurement range	Full J, K, T, E, N, B, R, S thermocouple range
Overvoltage protection	±30 V
ESD protection	4 kV
Synchronous acquisition	NO
Storage depth	64M Samples
Differential input impedance:	15 MΩ
Typical DC linearity:	±2 ppm
Maximum DC linearity:	±15 ppm

Open Thermocouple Detection (OTD)

OTD selection:	Software
OTD detection:	Per channel
OTD enabled input current:	0.5 μA/2 μA/4 μA
OTD disabled input current:	1 nA(SE) 200 pA(DS)

Common Mode Voltage Range

Channel-COM	0-3 V
Channel-Channel	0-3 V
COM-Earth ground	±300 V

Input bandwidth (-3 dB)

Sampling Rate(Sample/s)	50Hz Rejection Mode	60Hz Rejection Mode
5	2 Hz	2 Hz
25	19 Hz	11 Hz
40	19 Hz	22 Hz
400	222 Hz	222 Hz
800	445 Hz	445 Hz

PFI

Number of channels	4 channels PFI<0..3>
External digital trigger	Trigger voltage：5 V TTL
	Trigger edge：rising/falling
Direcrion	Input
6302's PFI is only used for external digital triggering	

Voltage Measurement Specifications

Basic Voltage Accuracy

JY6302 Basic Accuracy = ±(% Reading+% Range)					
Group total sampling rate (Sample/s)	Range (mV)	24 Hour Tcal ±1°C	90 Days Tcal ± 5°C	90 Days Full Scale Accuracy	90 Days Full Scale Accuracy (%)
40	78.125	0.029 + 0.008	0.034 + 0.011	35 µV	0.045
400	78.125	0.029 + 0.011	0.034 + 0.013	37 µV	0.047
800	78.125	0.029 + 0.015	0.034 + 0.016	39 µV	0.050

All Levels works with 24 bits resolution at the range of 78.125 mV
Total Samples rates <= 40 Samples/s, accuracy refer to 40 samples/s.
400 Samples/s>=Total Samples rates >40 Samples/s, accuracy refer to 400 samples/s.
Total Samples rates >400 Samples/s, accuracy refer to 800 samples/s.
Reference (Cold Junction Temperature): same as Operating Temperature
Terminal Block: TB-68CJ; Cable: ACL-2026868-01
Add 20% to Gain and Offset Errors From 91 Days to 1 Year.

Temperature Drift Adjustment

JY6302 Additional Accuracy Adjustment = ±(% Reading+% Range)			
Group total sampling rate (Sample/s)	Range (mV)	Temperature Coefficients (per °C)	Full-Scale Temp Adjustment (µV/ °C)
40	78.125	0.011 + 0.003	11 µV
400	78.125	0.010 + 0.003	10 µV
800	78.125	0.011 + 0.003	11 µV

All Levels works with 24 bits resolution at the range of 78.125 mV
Total Samples rates <= 40 Samples/s, accuracy refer to 40 samples/s.
400 Samples/s>=Total Samples rates >40 Samples/s, accuracy refer to 400 samples/s.
Total Samples rates >400 Samples/s, accuracy refer to 800 samples/s.
Reference (Cold Junction Temperature): same as Operating Temperature
Terminal Block: TB-68CJ; Cable: ACL-2026868-01

Temperature Measurement Accuracy

Temperature Measurement Accuracy(°C)				
Thermocouple Type	Temperature Range (°C)	Sample Rate (S/s)		
		40	400	800
J	-210 to 0	0.35	0.44	0.55
	0 to 760	0.34	0.38	0.44
	760 to 1200	0.53	0.57	0.64
K	-200 to 0	0.43	0.54	0.68
	0 to 500	0.34	0.40	0.48
	500 to 1300	0.71	0.78	0.89
N	-200 to 0	0.59	0.76	0.97
	0 to 600	0.38	0.45	0.53
	600 to 1300	0.65	0.71	0.81
T	-200 to 0	0.44	0.57	0.71
	0 to 400	0.23	0.27	0.34
E	-200 to 0	0.31	0.39	0.48
	0 to 1000	0.44	0.47	0.52
R	-50 to 250	1.66	2.24	2.93
	250 to 1064	0.88	1.17	1.51
	1064 to 1664.5	1.04	1.23	1.48
	1664.5 to 1768.1	1.20	1.41	1.68
S	-50 to 250	1.61	2.18	2.85
	250 to 1064	0.95	1.23	1.59
	1064 to 1664.5	1.16	1.39	1.68
	1664.5 to 1768.1	1.34	1.59	1.92
B	250 to 700	4.64	5.69	6.93
	700 to 1820	1.27	1.67	2.14
C	0 to 2315	2.14	2.41	2.79
A	100 to 480	0.60	0.76	0.95

Operating Temperature: Tcal±1°C

Total Samples rates <= 40 Samples/s, accuracy refer to 40 samples/s.
400 Samples/s>=Total Samples rates >40 Samples/s, accuracy refer to 400 samples/s.
Total Samples rates >400 Samples/s, accuracy refer to 800 samples/s.

Reference (Cold Junction Temperature): same as Operating Temperature
The measurement errors do not include the errors from the thermocouple
Terminal Block: TB-68CJ; Cable: ACL-2026868-01

Timing and Trigger

Digital Trigger

	PXIe-6302	PCIe-6302	TXI-6302	USB-6302
Trigger source	PXI_TRIG <0..7> PXI_STAR PFI<0..3>	SSI<0..7>* PFI<0..3>	SSI<0..7>* PFI<0..3>	PFI<0..3>
Trigger Mode	Start Reference ReTrigger	Start Reference ReTrigger	Start Reference ReTrigger	Start Reference ReTrigger
Polarity	Software selectable	Software selectable	Software selectable	Software selectable
*SSI<0..7> definition please refer to section 6.7				

Physical and Environment

Bus

	PXIe-6302	PCIe-6302	TXI-6302	USB-6302
Bus Type	x4 PXI Express peripheral module Specification V1.0 compliant	x4 PCI Express 2.0	Thunderbolt3	USB3.0
Slot supported	x1 and x4 PXI Express or PXI Express hybrid slots	x4/x8/x16 PCIe slot	Thunderbolt3/Thunderbolt4/USB 4.0	USB3.0

Size

Product Model	Size(mm)	Weight(g)
PXIe-6302	160 x 100	196
PCIe-6302	167.7 x 111.2	177
USB-6302	208.1 x 128 x 36.4*	964
*Length including connectors		

Power

3.3V	2.0 A
12V	0.04 A

Operating Environment

Ambient temperature range	0 ℃ to 50 ℃
Relative humidity range	20% to 80%, noncondensing

Storage Environment

Ambient temperature range	-20 ˚C to 80 ˚C
Relative humidity range	10% to 90%, noncondensing

Order Information

- PXIe-6302 (PN: JY2016302-01)
  32-ch 24-bit PXIe Temperature input card for thermocouple
- PCIe-6302 (PN: JY2116302-02)
  32-ch 24-bit PCIe Temperature input card for thermocouple
- USB-6302 (PN: JY2116302-03)
  32-ch 24-bit USB Temperature input module for thermocouple

Accessories

- TB-68CJ (PN: JY2010068-01)
  68-Pin SCSI Shielded I/O Connector Block with cold junction sensor
- ACL-2026868-1 (PN: JY2026868-01)
  1M 68pin VHDCI68M-SCSI68M 100Ω all shielded cable
- ACL-2026868-2 (PN: JY2026868-02)
  2M 68pin VHDCI68M-SCSI68M 100Ω all shielded cable

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