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NORVI CONTROLLERS NORVI X-RTD4 | RTD INPUT

The **NORVI X-RTD4** is a high-precision 4-channel RTD expansion module for the NORVI X modular controller platform. It utilizes the **15-bit ADC** to provide laboratory-grade temperature digitization for Platinum RTDs.

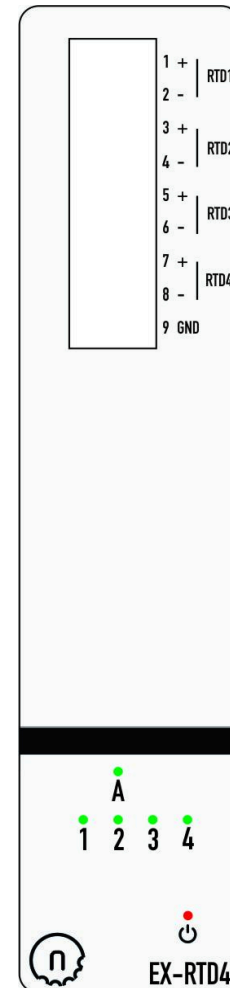
The module features an integrated analog multiplexer and an onboard **STM32 MCU**, allowing for sequential monitoring of four independent sensors while offloading processing from the main controller.

Product Features

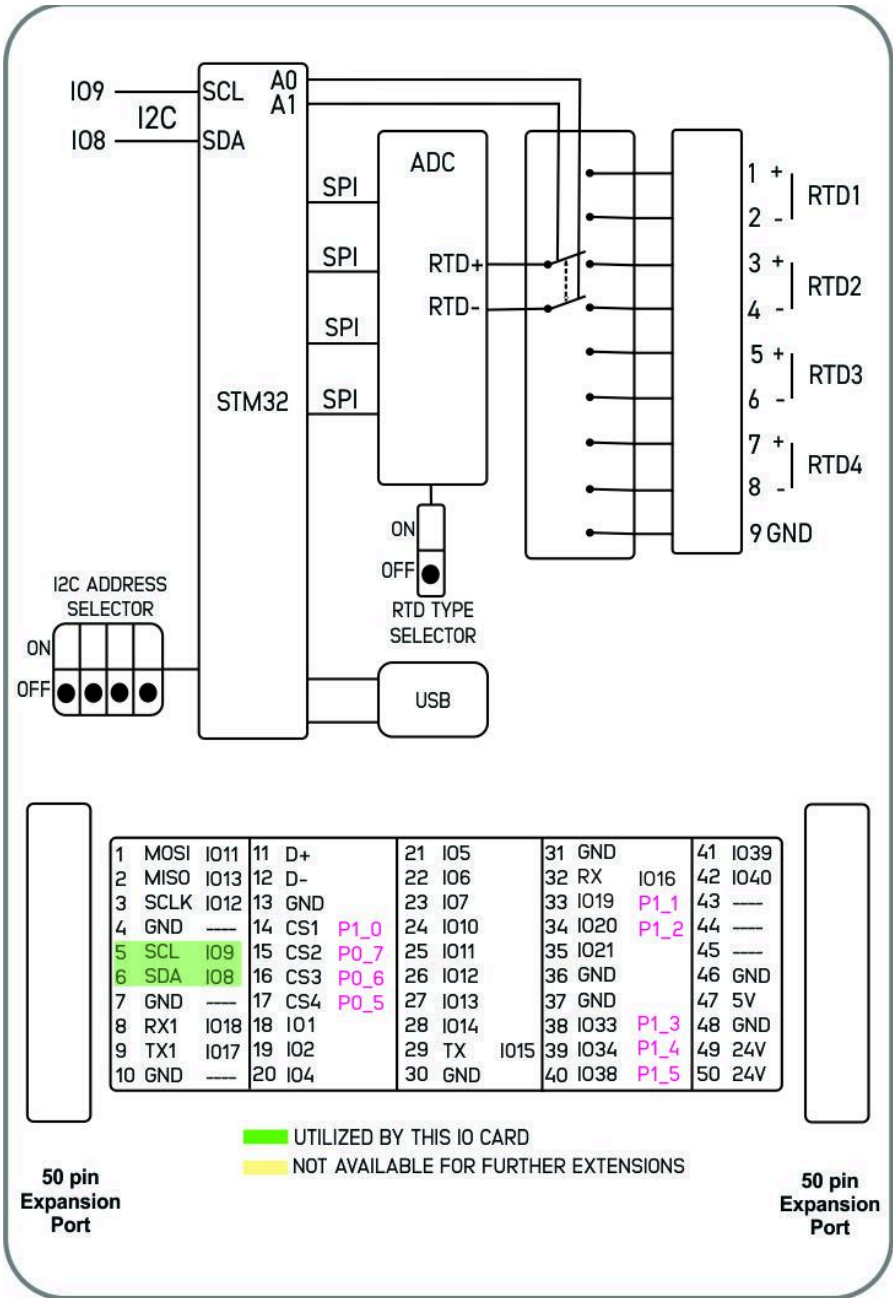
- High-Precision ADC Integrated 15-bit RTD-to-Digital converter
- 4-Channel Input Sequential monitoring
- Flexible Wiring
- Automatic Fault Detection
- 4-Way DIP Switch and RTD type selection DIP
- Status LED indicators for each input channel
- Plug-and-play connection to NORVI X CPU module via expansion bus
- DIN-rail Mounting

Applications

- Industrial automation and control systems
- HVAC and Building Automation
- Medical and Laboratory Equipment
- Energy and Power Systems
- Environmental Data Logging



Product Block Diagram



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Main

Range of Product	NORVI X
Product type	Expansion Module for NORVI X Series
Certifications	EN 61131-2:2007 EN 61010-1:2010+A1:2019 EN IEC 61010-2-201:2018 2014/30/EU- Electromagnetic Compatibility (EMC) Annex III, Part B, Module C
Rated supply voltage	24V DC

Complementary

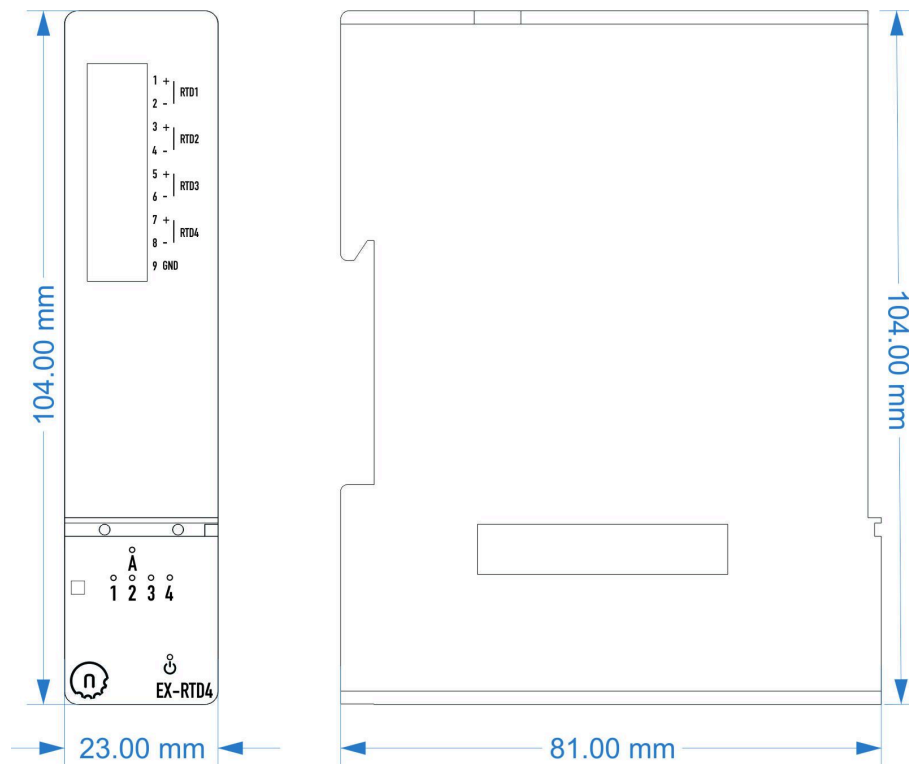
Product Part Numbers	NORVI X-RTD4
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Mechanical Properties

Enclosure	NORVI X-N1
Mounting / Installation Method	DIN RAIL
Terminal Type	Push-in terminal
Terminal Arrangement	Front
Length	81.00 mm
Height	104.00 mm
Width	23.00 mm

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Environment

IP degree of protection	IP20
Operating altitude	0 - 2000 meters
Operating Temperature	- -10 ... +85° C (14...185 °F)
Storage altitude	0 - 3000 meters
Shock resistance	15 gn for 11ms
Resistance to electrostatic discharge	4kV on contact 8kV on air
Resistance to electromagnetic fields	10 V/m (80 MHz 1GHz) 3 V/m (1.4 MHz 2 GHz) 1 V/m (2 MHz 3 GHz)

Electrical Characteristics

Grid Powered Devices

Rated Supply Voltage (V)	24V DC
Current Consumption (mA)	80mA @ 24VDC

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I/O Specifications

Parameter	Specification
Input Channels	4 Independent RTD Channels
Resolution	15-bit
Debug Interface	Micro-USB (For Debugging)
Communication	I2C via Expansion Bus
Microcontroller	STM32 Series (Internal Bridge)
Power Supply	24V DC (via Expansion Bus)
Internal Interface	High-Speed SPI (MCU to ADC Output Stage)

Terminal Configuration

No.	Terminal	Description
1	+RTD1	Positive Input - Channel 1
2	-RTD1	Negative Input - Channel 1
3	+RTD2	Positive Input - Channel 2
4	-RTD2	Negative Input - Channel 2
5	+RTD3	Positive Input - Channel 3
6	-RTD3	Negative Input - Channel 3
7	+RTD4	Positive Input - Channel 4
8	-RTD4	Negative Input - Channel 4
9	GND	Ground

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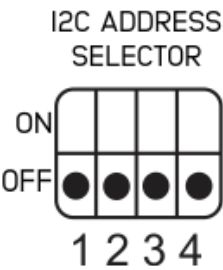
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GPIO Utilization

Utilization	Connection to CPU
SCL	IO9
SDA	IO8

I2C Address Selection



Address Selection				
DIP 1	DIP 2	DIP 3	DIP 4	Address
OFF	OFF	OFF	OFF	0x3F
ON	OFF	OFF	OFF	0x3E
OFF	ON	OFF	OFF	0x3D
ON	ON	OFF	OFF	0x3C
OFF	OFF	ON	OFF	0x3B
ON	OFF	ON	OFF	0x3A
OFF	ON	ON	OFF	0x39
ON	ON	ON	OFF	0x38
OFF	OFF	OFF	ON	0x37
ON	OFF	OFF	ON	0x36
OFF	ON	OFF	ON	0x35
ON	ON	OFF	ON	0x34
OFF	OFF	ON	ON	0x33
ON	OFF	ON	ON	0x32
OFF	ON	ON	ON	0x31
ON	ON	ON	ON	0x30

RTD Type Selection



OFF	PT1000
ON	PT100

RTD TYPE SELECTOR

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Expansion Port

Utilized GPIO Connections are highlighted in Green. They cannot be used for any other purpose with this module connected.

PIN INDEX	Purpose	GPIO	SOURCE
1	MOSI	IO11	ESP32-S3
2	MISO	IO13	
3	SCLK	IO12	
4	GND	----	
5	SCL	IO9	
6	SDA	IO8	
7	GND	----	
8	RX1	IO18	
9	TX1	IO17	
10	GND	----	
11	D+	----	
12	D-	----	
13	GND	----	
14	CS1	P1_0	PCA9539 I2C Address 0x75
15	CS2	P0_7	
16	CS3	P0_6	
17	CS4	P0_5	
18	IO1	IO1	ESP32-S3
19	IO2	IO2	
20	IO4	IO4	
21	IO5	IO5	
22	IO6	IO6	
23	IO7	IO7	
24	IO10	IO10	
25	IO11	IO35	
26	IO12	IO36	
27	IO13	IO37	
28	IO14	IO14	
29	RS485_TX	IO15	
30	GND	----	

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31	GND	----	
32	RS485_RX	IO16	
33	P1_1	P1_1	PCA9539 I2C Address 0x75
34	P1_2	P1_2	
35	IO21	IO21	ESP32-S3
36	GND	----	
37	GND	----	
38	P1_3	P1_3	PCA9539 I2C Address 0x75
39	P1_4	P1_4	
40	P1_5	P1_5	
41	IO39	IO39	ESP32-S3
42	IO40	IO40	
43	NC	----	
44	NC	----	
45	NC	----	
46	GND	----	
47	5V	5V	
48	GND	GND	
49	24V	24V	
50	24V	24V	

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Technical Support

E-mail : support@norvi.io

Sales Inquiries

E-mail support@norvi.io

Web www.norvi.lk/support

Order Online www.norvi.io