

DATASHEET

NORVI CONTROLLERS

NORVI X-AI4 | 4 x Analog Inputs Expansion

The **NORVI X-AI4** is an 4 x Analog Inputs Expansion module designed for the NORVI X modular controller platform.

It provides four analog input channels suitable for industrial monitoring and measurement applications.

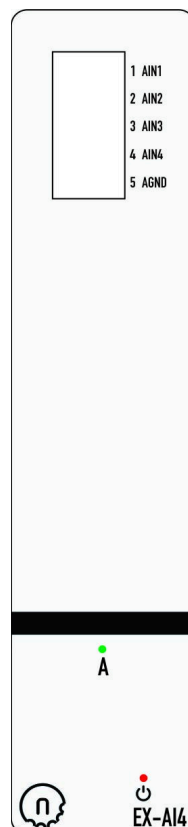
The inputs are conditioned using **precision signal amplifiers** and digitized through an **ADS1115 I²C ADC**, enabling accurate data acquisition with minimal **MCU I/O** usage.

Product Features

- 4 × Analog Input channels
- High-resolution ADC (16-bit)
- I²C communication interface
- Suitable for industrial signal monitoring
- Compact design for expansion systems
- Designed for NORVI X modular architecture

Applications

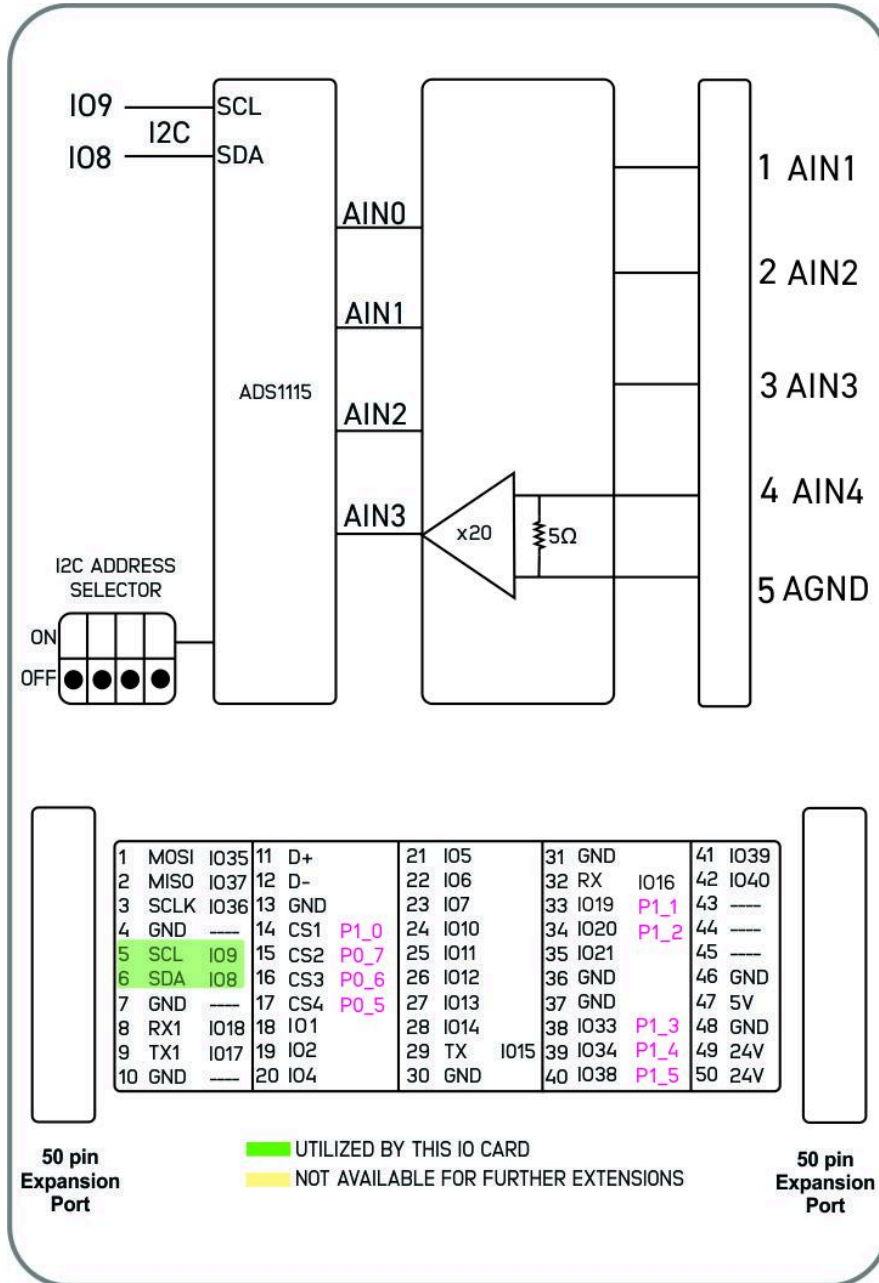
- Industrial process monitoring
- Current and voltage measurement systems
- PLC and industrial controller expansion
- Factory automation and control panels



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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-AI4
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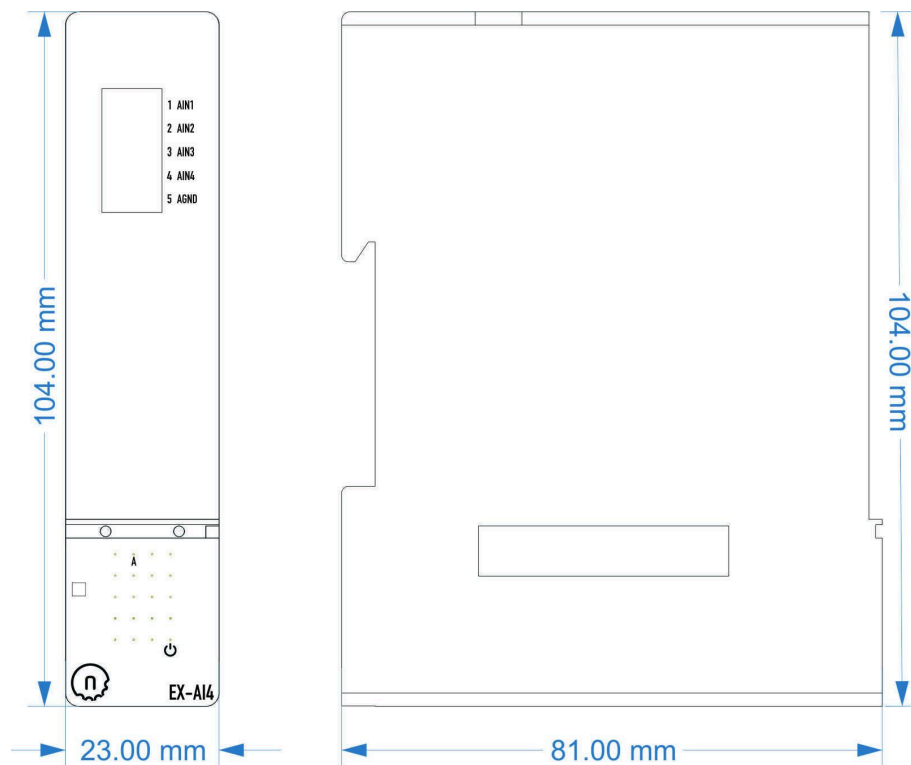
Mechanical Properties

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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Analog Inputs

Number of Analog Inputs	4
Analog Input Measurement Range	4 – 20mA / 0 - 20mA
Analog to Digital Converter (ADC)	ADS1115
Analog to Digital Converter (ADC) Resolution	16-bit
Analog to Digital Converter (ADC) Communication	I2C
ADC Power Supply	3.3V

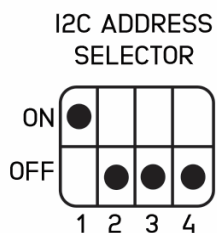
Terminal Configuration

No.	Terminal	Description
1	AIN1	Analog Input Channel 1
2	AIN2	Analog Input Channel 2
3	AIN3	Analog Input Channel 3
4	AIN4	Analog Input Channel 4
5	GND	Ground

GPIO Utilization

Utilization	Connection to CPU
SCL	IO9
SDA	IO8

I2C Address Selection



Address Selection				
DIP 1	DIP 2	DIP 3	DIP 4	Address
ON	OFF	OFF	OFF	0x49
OFF	ON	OFF	OFF	0x4B
OFF	OFF	ON	OFF	0x4A
OFF	OFF	OFF	ON	0x48

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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	
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	----	
31	GND	----	
32	RS485_RX	IO16	
33	P1_1	P1_1	PCA9539 I2C Address 0x75
34	P1_2	P1_2	

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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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