DATASHEET

NORVI CONTROLLERS

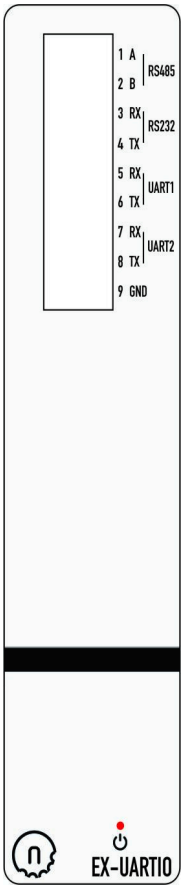
NORVI X-UARTIO | UART INPUT/OUTPUT Expansion

The **NORVI X-UARTIO** is a versatile communication expansion module for the NORVI X modular controller platform. It provides multiple serial communication interfaces including **RS485, RS232, and UART**, enabling flexible connectivity to industrial devices, sensors, meters, and peripherals.

The module uses shared MCU I/O lines with intelligent switching, allowing multiple physical ports to be supported while minimizing processor pin usage. Interface selection is fully controlled via firmware.

Product Features

- RS485 communication port
- RS232 communication ports
- 2 × UART ports (multiplexed)
- Industrial-grade RS485 and RS232 transceivers
- UART pins usable as GPIO when not configured for UART
- Designed for NORVI X expansion architecture



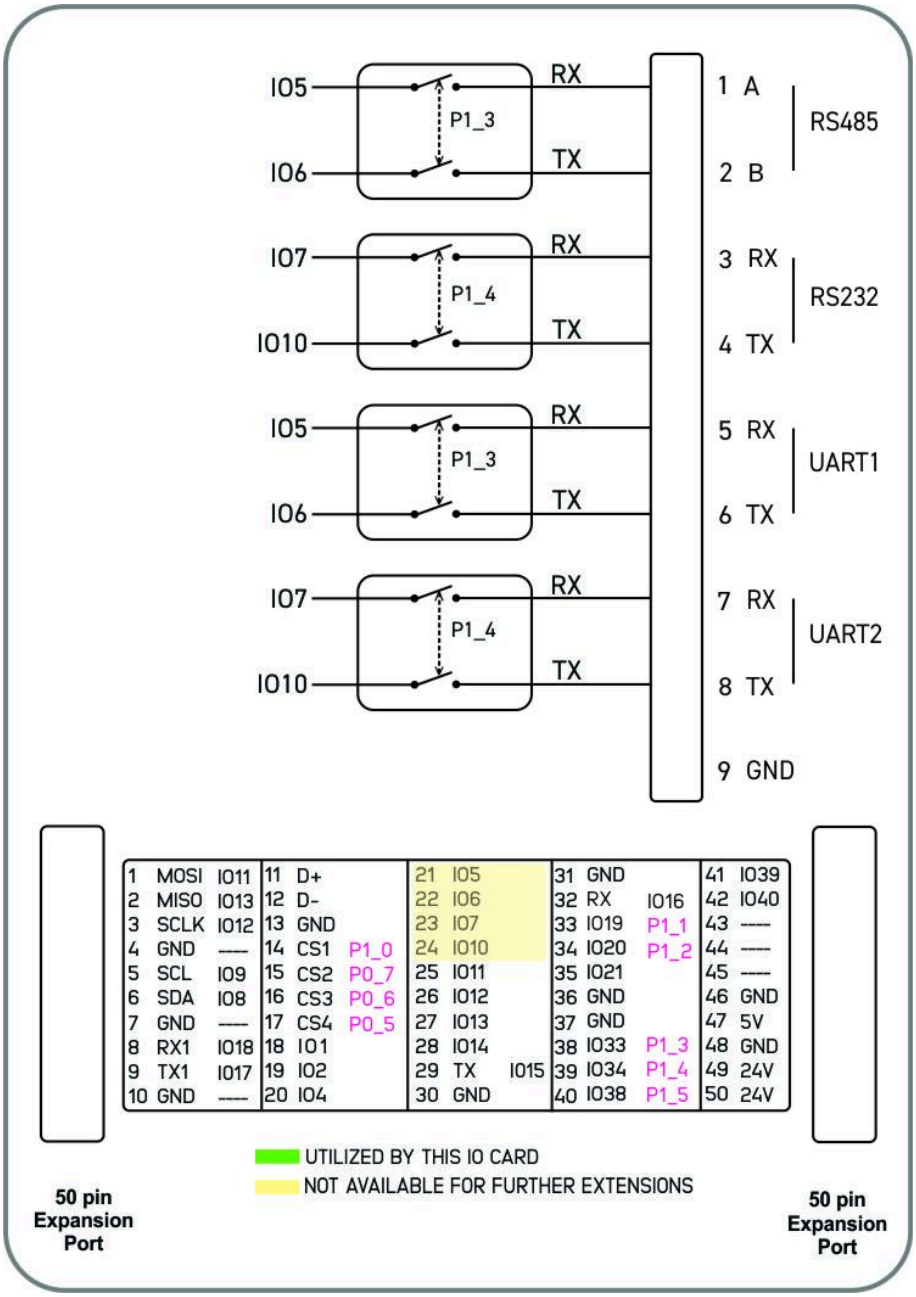
System Architecture

- RS485: Half-duplex differential communication
- RS232: Full-duplex serial communication
- UART (TTL level): Direct MCU UART / GPIO connectivity

Applications

- Industrial automation and control systems
- Modbus RTU and serial fieldbus communication
- Sensor and meter integration
- Legacy device connectivity via RS232
- Multi-device UART expansion
- OEM and system integrator solutions

Product Block Diagram



Main

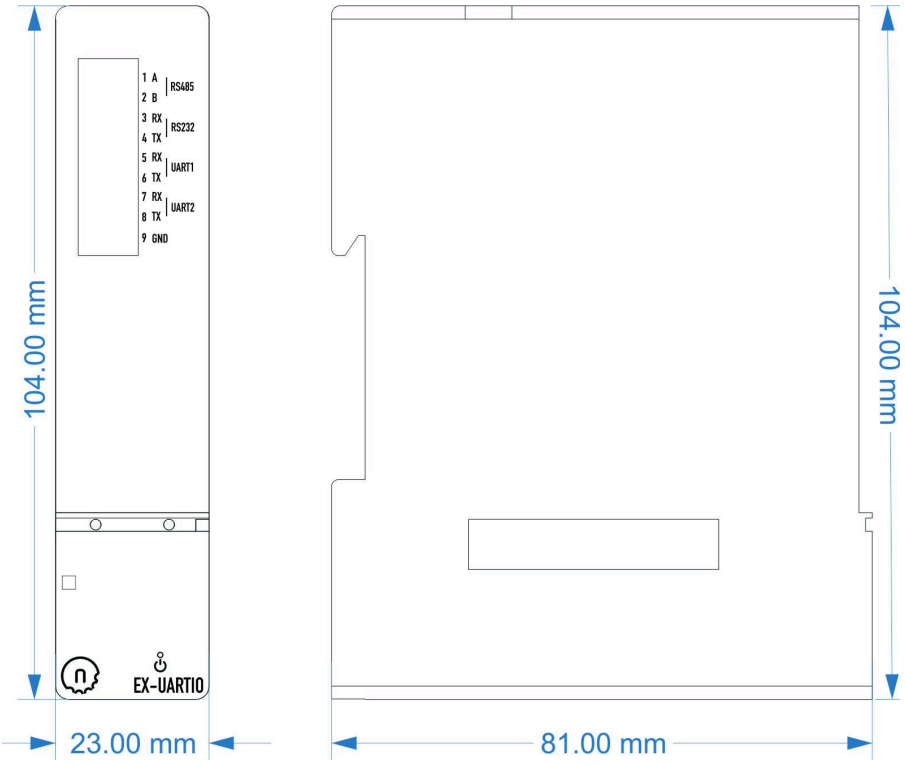
Range of Product	NORVI X
Product type	Expansion Module for NORVI X Series
Certifications	EN 61131-2:2007 EN 61010-1:2010+A1:2019 EN IEC 61010-2-201:2018 2014/30/EU- Electromagnetic Compatibility (EMC) Annex III, Part B, Module C
Rated supply voltage	24V DC

Complementary

Product Part Numbers	NORVI X-UARTIO

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



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

I/O Specifications

Parameter	Specification
RS485 Channels	1 (Selectable)
RS232 Channels	1 (Selectable)
UART Channels	2 (Multiplexed)
UART Logic Level	TTL
Power Supply	Supplied via NORVI X expansion bus
Communication Bus	Internal Expansion Bus
Connector Type	Push-in Terminal Block

Terminal Configuration

No.	Terminal	Description
1	RS485-A	RS485 Channel – A
2	RS485-B	RS485 Channel – B
3	RS232-RX	RS232 Channel – RX
4	RS232-TX	RS232 Channel – TX
5	UART-1RX	UART Channel 1 – RX
6	UART-1TX	UART Channel 1 – TX
7	UART-2RX	UART Channel 2 – RX
8	UART-2TX	UART Channel 2 – TX
9	GND	Ground

GPIO Utilization

RS485 Interface

- **RX: IO5**
- **TX: IO6**
- **Channel Select: P1_3 - Expanded IO from CPU**
- **Active Channel: RS485**

RS232 Interface

- **RX: IO7**
- **TX: IO10**
- **Channel Select: P1_4 - Expanded IO from CPU**
- **Active Channel: RS232**

UART - 1

- **RX: IO5**
- **TX: IO6**
- **Channel Select: P1_3 - Expanded IO from CPU - Refer CPU Datasheet**

UART - 2

- **RX: IO7**
- **TX: IO10**
- **Channel Select: P1_4 - Expanded IO from CPU - Refer CPU Datasheet**

Expansion Port

Utilized GPIO Connections are highlighted in Yellow. 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	----	
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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