Product data sheet

Characterstics

NORVI GSM

AE08 Series

Cellular Connected ESP32

Features

- ESP32-WROOM32 Module
- GSM / LTE Connection
- Built-in 0.96 OLED Display
- microSD Card Support
- DS3231 RTC with Battery Backup
- Ethernet via W5500
- Built-in Button on front panel
- Digital Inputs
- Analog Inputs
- Transistor Outputs
- DIN-Rail mount

Cellular Options

Quectel EC21

- Worldwide LTE, UMTS/HSPA(+) and GSM/GPRS/EDGE coverage
- Supports DFOTA and DTMF

SIMCOM SIM800-C

- Quad-band GSM/GPRS module
- DTMF, MMS, MUX
- Embedded TCP/UDP protocols

Expansions supported

Temperature
MAX31856

Analog
4-20mA / 0 - 10V

Main

Range of product	NORVI GSM	
Product type	Programmable Controller	
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	
Communication	WiFI / Bluetooth GSM / GPRS - SIMCOM SIM800C LTE / EDGE - Quectel EC21	
OLED Display protocol	I2C	
Analog input range	4 - 20mA / 0 - 10V	
Analog input resolution	16 bit	
Transistor Output Rating	500mA 300mW	
Relay Output Rating	5A, 250VAC/30VDC (resistive) | 3A, 250VAC/30VDC (general USE)	

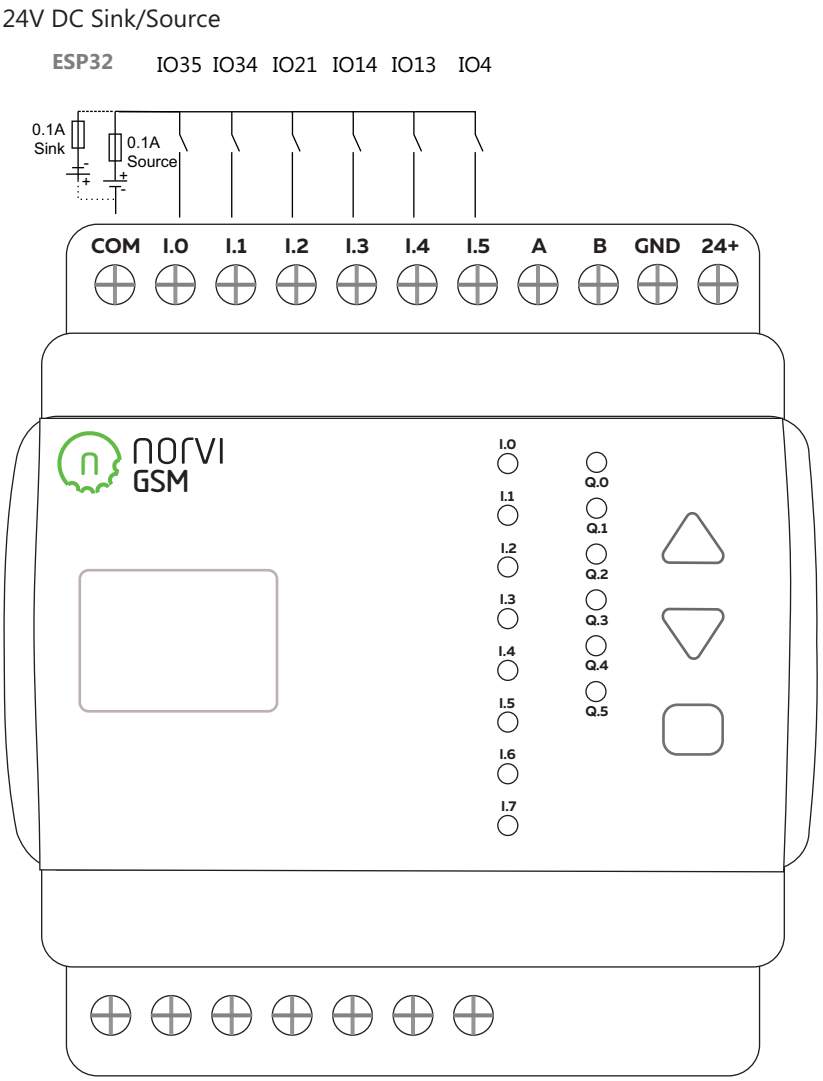
Complementary

Number of Expansions	-----
Supply voltage limits	20.4....28.8V
Inrush current	<=50A
Power consumption in W	32.6.....40.4 with all outputs ON
Discrete logic input	Sink or source
Discrete input voltage	24V
Discrete input voltage type	DC
Voltage state 1 guaranteed	>=15 V for input
Voltage state 0 guaranteed	<=5 V for input
Discrete input current	5 mA for input
Input impedance	4.7k Ohm for input
Memory capacity	Refer datasheet of base micro-controller
Battery type	-----
Backup time	-----
Local signalling	1 LED green for PWR
Electrical connection	Removable screw terminal block for inputs and outputs (pitch 5.08 mm)
Mounting support	Top hat type TH35-15 rail conforming to IEC 60715 Top hat type TH35-7.5 rail conforming to IEC 60715 Plate or panel with fixing kit
Height	90.50 mm
Depth	56.60 mm
Width	60.60 mm
Product weight	0.43 Kg

Environment

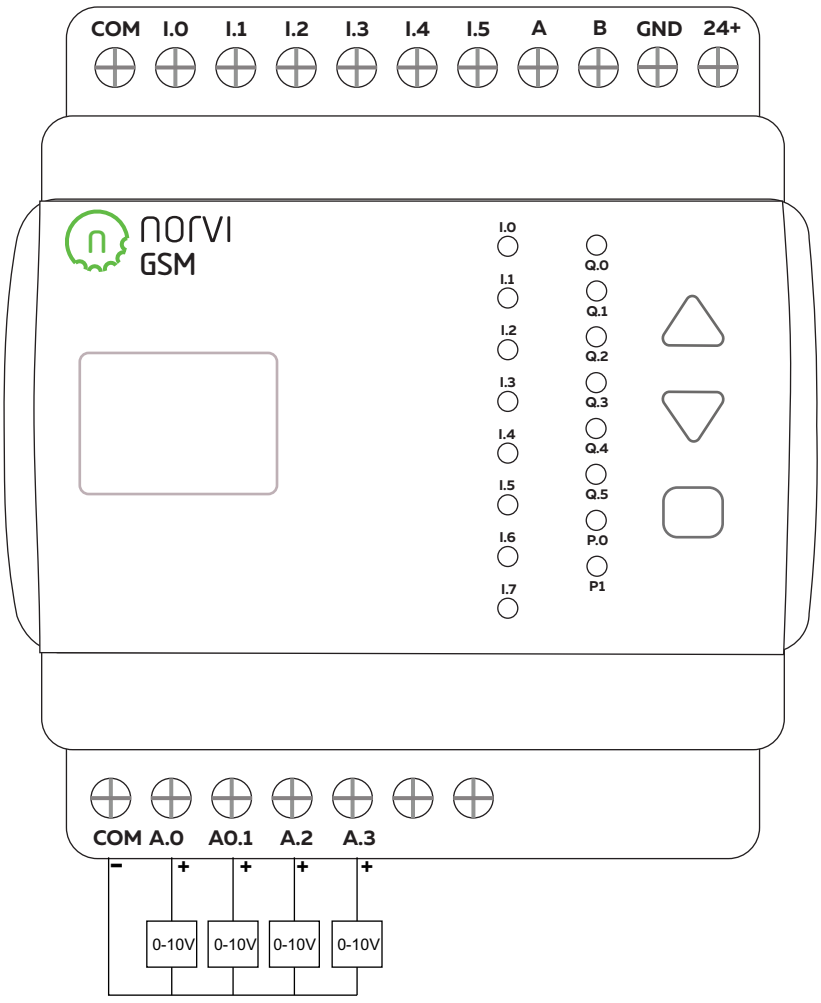
Resistance to electrostatic discharge	4kV on contact 8kV on air
Resistance to electro magnetic fields	10 V/m (80 MHz ..... 1GHz) 3 V/m (1.4 MHz ..... 2 GHz) 1 V/m (2 MHz ..... 3 GHz)
Immunity to microbreaks	10 ms
Relative humidity	10....95% without condensation in operation
IP degree of protection	IP20
Operating Temperature	–10 ... +85° C (14...185 °F)
Storage Temperature	–25 ... +85° C (–13...185 ° F)
Operating altitude	0...2000m
Storage altitude	0...3000m
Shock resistance	15 gn for 11 ms

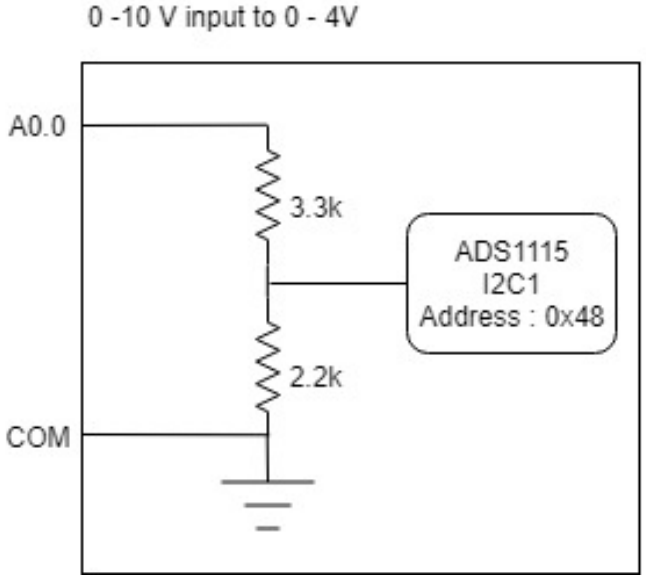
Digital inputs wiring diagram



Analog input wiring diagram (0-10V)

***AE-08-V**



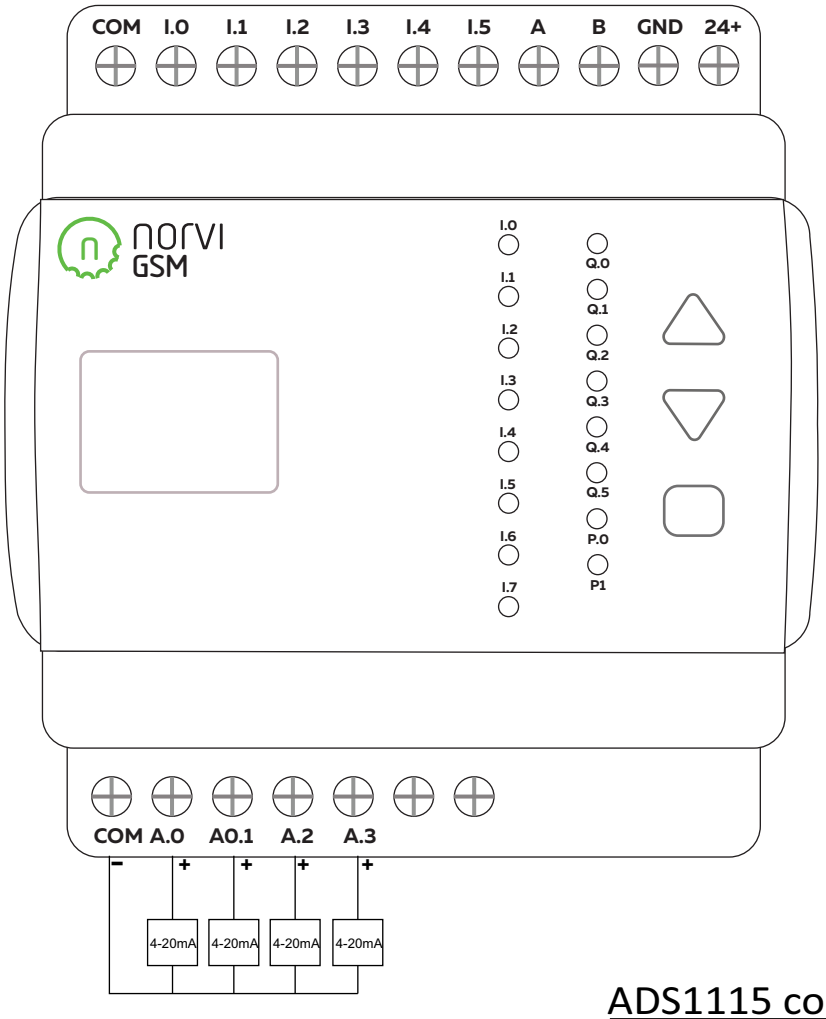


ADS1115 connections

IC Type	ADS 1115
Communication	I2C IO16 - IO17
Module Address	0x48 / 0x49
Resolution	16 bit

Analog input wiring diagram (4-20mA)

***AE-08-I**



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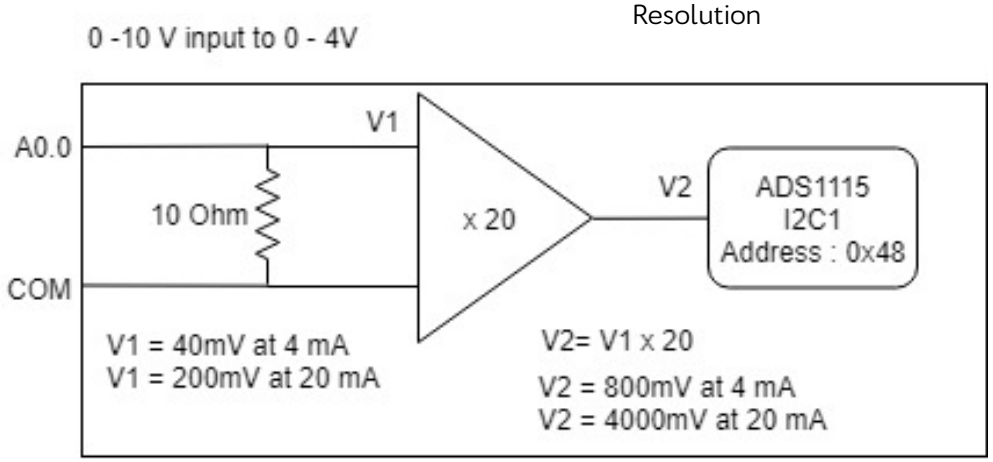
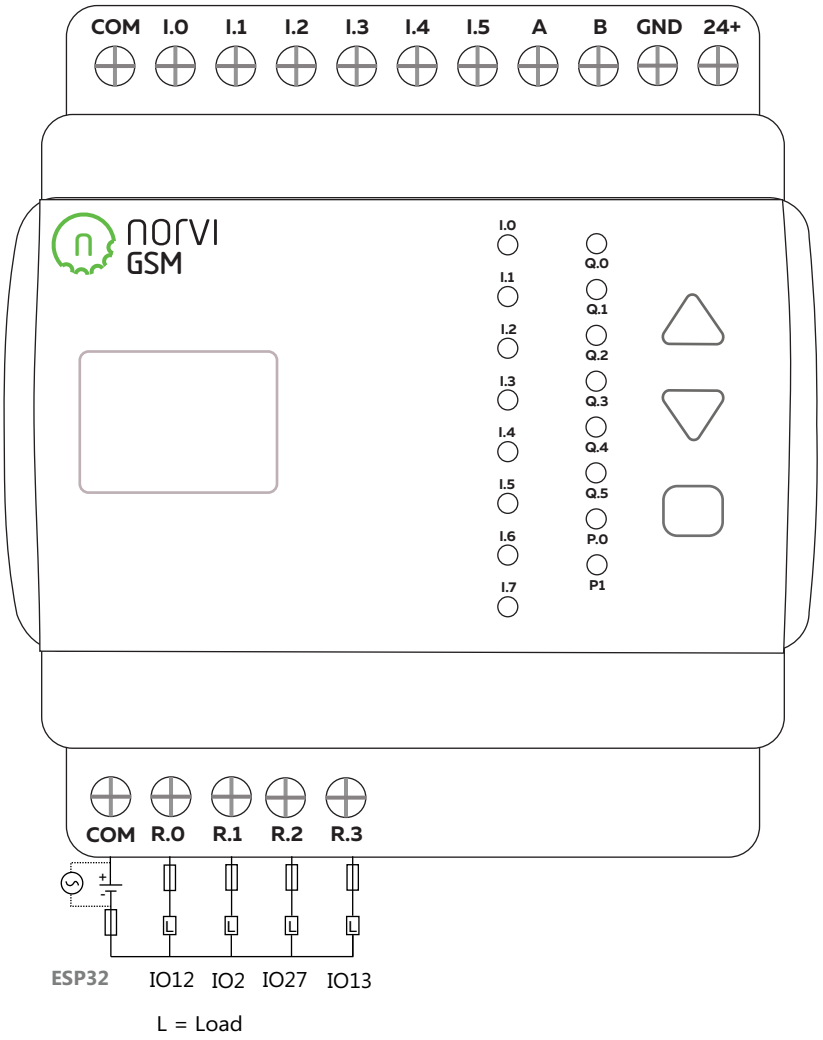
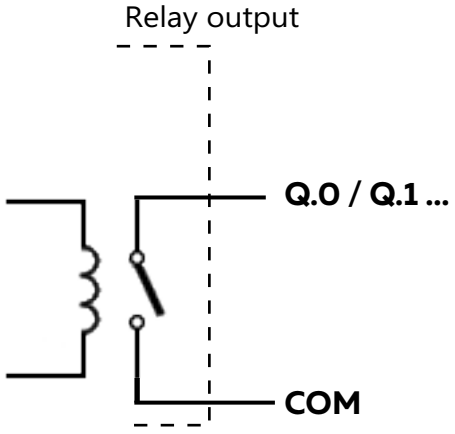
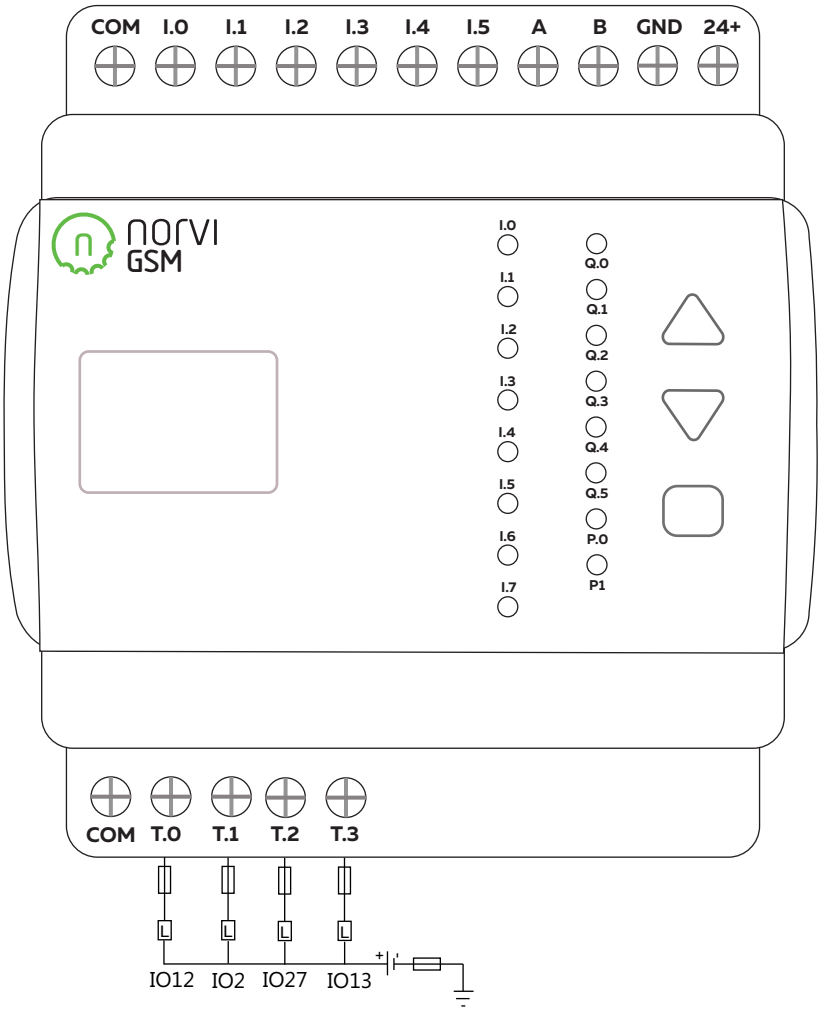


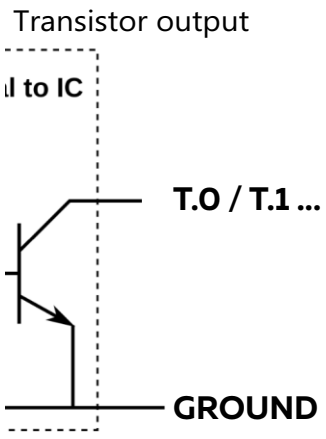
Relay outputs wiring diagram





Transistor outputs wiring diagram





GPIO MAP

GPIO ALLOCATION		
GPIO		**IIOT-AE08 SERIES**
0	outputs PWM signal at boot	
1	debug output at boot	TXD
2	connected to on-board LED	O2
3	HIGH at boot	RXD
4		INPUT 6
5	outputs PWM signal at boot	ETHERNET CS
6	connected to the integrated SPI flash	
7	connected to the integrated SPI flash	
8	connected to the integrated SPI flash	
9	connected to the integrated SPI flash	
10	connected to the integrated SPI flash	
11	connected to the integrated SPI flash	
12	boot fail if pulled high	O1
13		O4
14	outputs PWM signal at boot	INPUT 4
15	outputs PWM signal at boot	SD CS
16		SDA
17		SCL
18		SCLK
19		MISO
21		INPUT 3
22		RS-485 FC
23		MOSI
25		RS-485 RX
26		RS-485 TX
27		O3
32		GSM RX
33		GSM TX
34	input only	INPUT 2
35	input only	INPUT 1
36	input only	BUTTON INPUT
39	input only	INPUT 5

0.96 OLED Display parameters

Display driver	SSD1306
Communication	I2C IO16(SDA) - IO17(SCL)
Module Address	0x3C
Resolution	128 x 64

GSM Connection

Display driver	SIM800C
Communication	UART
Baud Rate	Configurable / 9600bps Default
Connection	RXD IO32 TXD IO33

W5500 Ethernet

Ethernet PHY	W5500
Connection	SCK IO18 MISO IO19 MOSI IO23 CS IO26 *IO5 CS of microSD should be High for the W5500.

RTC parameters

Display driver	DS3231
Communication	I2C IO16(SDA) - IO17(SCL)
Module Address	0x68
Battery Backup	YES

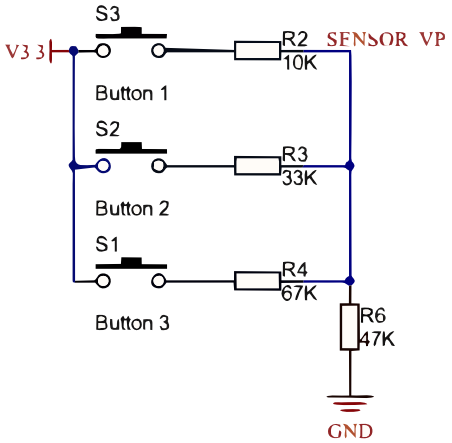
microSD card access

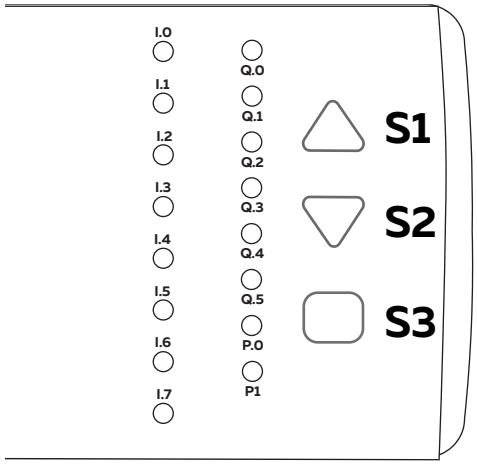
Connection	SCK IO18 CS IO5 MISO IO19 MOSI IO23

Built in buttons

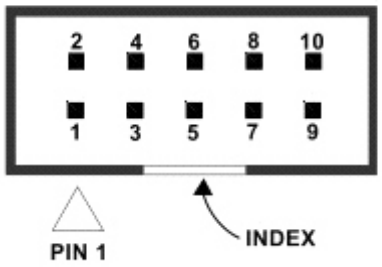
Read mode	ADC (Analog to Digital Conversion)
Analog IO	GPIO 36 / SENSOR_VP

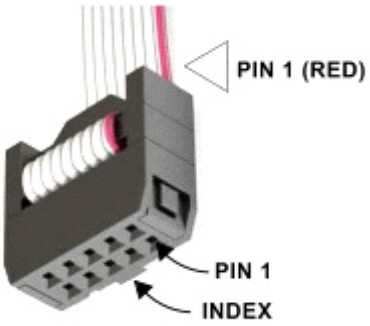
Voltage levels 3





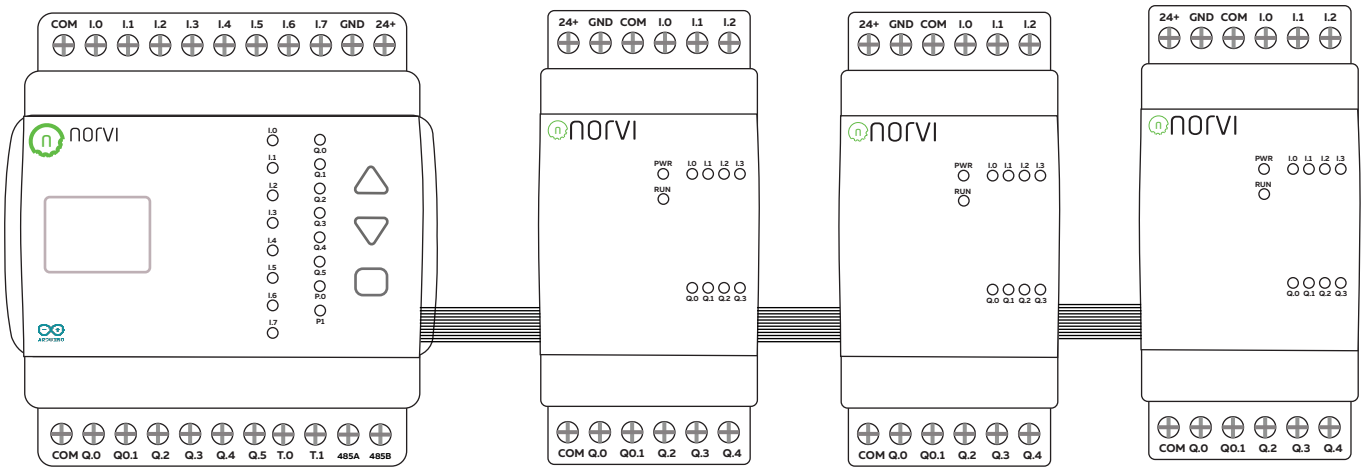
Expansion port





PIN	ESP32 Connection
1	--
2	TXD0
3	5V
4	RXD0
5	BOOT IO0
6	--
7	3.3V
8	SCL IO17
9	Ground
10	SDA IO16

Expansion modules



Main Controller **Expansion Module** **Expansion Module** **Expansion Module**

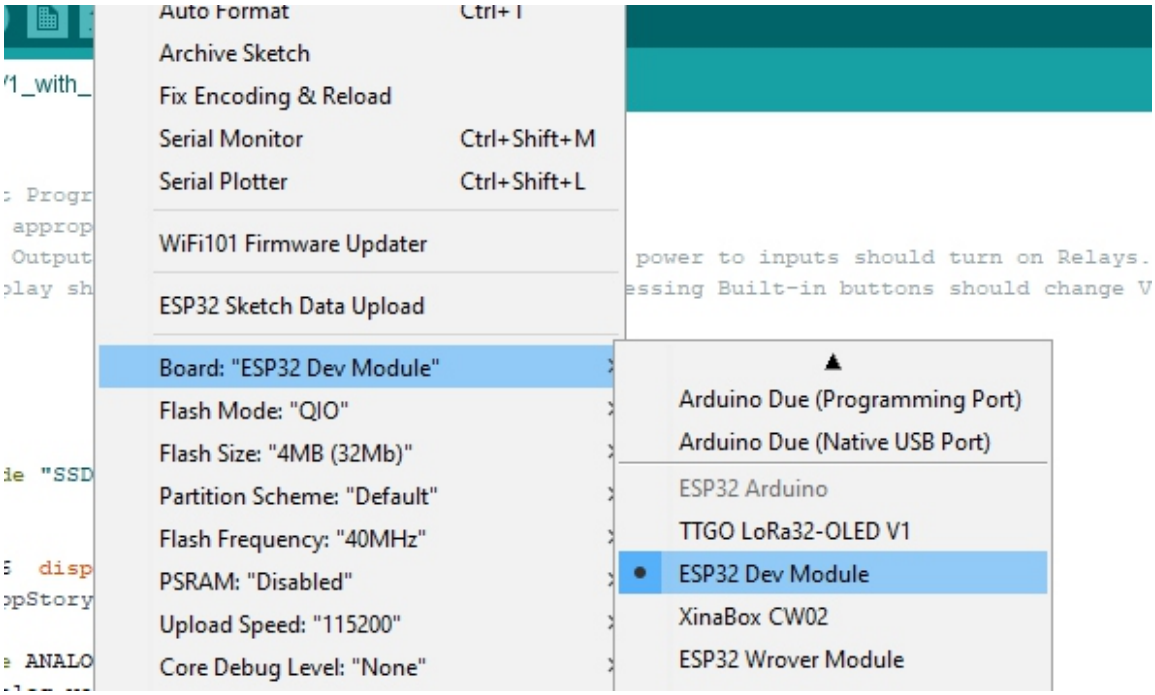
Expansion modules connects to the right side of the controller

Upto 6 expansion modules can be connected on one controller

Expansion modules use I2C, UART and GPIO on the expansion port

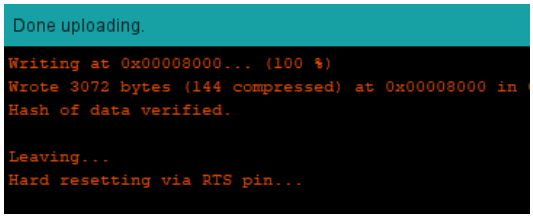
Depending on the model, some expansion modules require external power

Programming procedure



Board	ESP32 Dev Module
Flash Mode	QIO
Flash Size	4MB
Flash Frequency	10MHz
PSRAM	Disabled
Upload Speed	115200

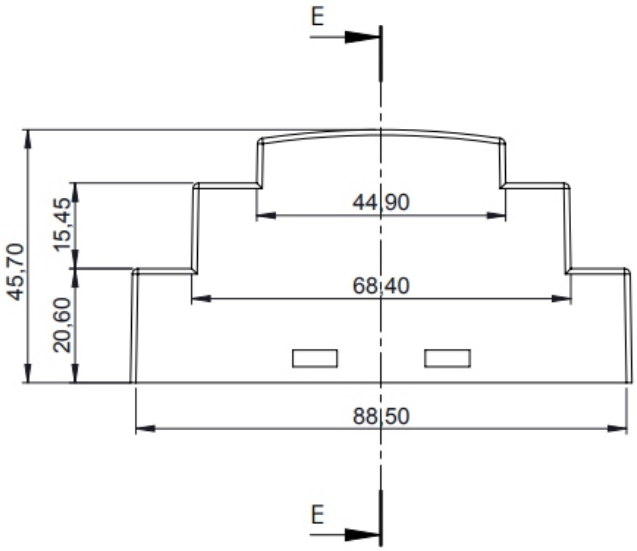
After successful uploading of program following message appears.



esp32 Boards must be installed under board manager, it is recommended to use the latest version of esp32 board driver for Arduino.

Due to installation of different drivers and older versions of libraries, Arduino fails to upload the program to the controller. In most cases it is due to failure to enter boot mode of the device.
The device can be forced to boot mode by connecting the BOOT IO0 of the expansion port to the GND pin with a jumper wire. Arduino is able to upload the program to controller while the controller is in boot mode.
After uploading the program , the connection between the BOOT IO0 and GND must be removed to run the uploaded program.

Dimensions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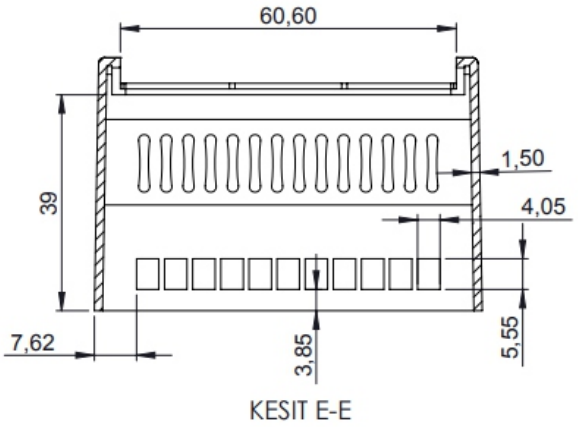
45,70
15,45
20,60
44,90
68,40
88,50
E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39
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4,05
7,62
3,85
5,55
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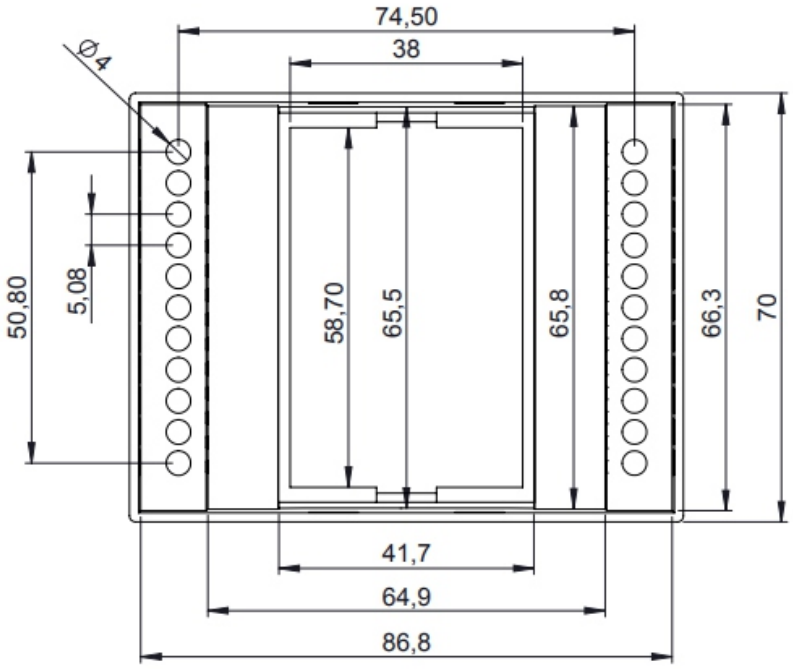
74,50
38
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50,80
5,08
58,70
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65,8
66,3
70
41,7
64,9
86,8

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