

# Product data sheet

## Characteristics

# NORVI IIOT

## ESP32 WROOM

### AE-01 Series

8 Digital Inputs  
6 Relay outputs  
2 Transistor outputs  
RS-485 communication  
Built in OLED Display

### AE-02 Series

8 Digital Inputs  
6 Analog Inputs  
2 Transistor outputs  
RS-485 communication  
Built in OLED Display



**CE** 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

### Optional

micro SD card support  
DS3231 RTC with battery backup

### Display options

0.96 OLED Display  
0.96 TFT Color Display  
1.44 TFT Color Display



### Expansions supported

LoRa communications  
REYAX RYLR896



NB-IOT  
BC95 module



Temperature  
MAX31856



Analog  
4-20mA / 0 - 10V



Load cell  
HX-711



## Main

Range of product	NORVI IIOT	
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	
Discrete input number	8 discrete input	
Discrete output type	Relay and Transistor	
Discrete output number	6 Relay outputs , 2 Transistor outputs	
Discrete output voltage	24V DC for transistor output	
Discrete output current	0.5A with T0.0... T0.1 Transistor 2 A with R0....R5	
Communication	1 x RS-485	
OLED Display protocol	I2C	
TFT Display protocol	SPI	
Analog input range	4 - 20mA (AE02-I) / 0 - 10V (AE02-V)	
Analog input resolution	16 bit	

## Complementary

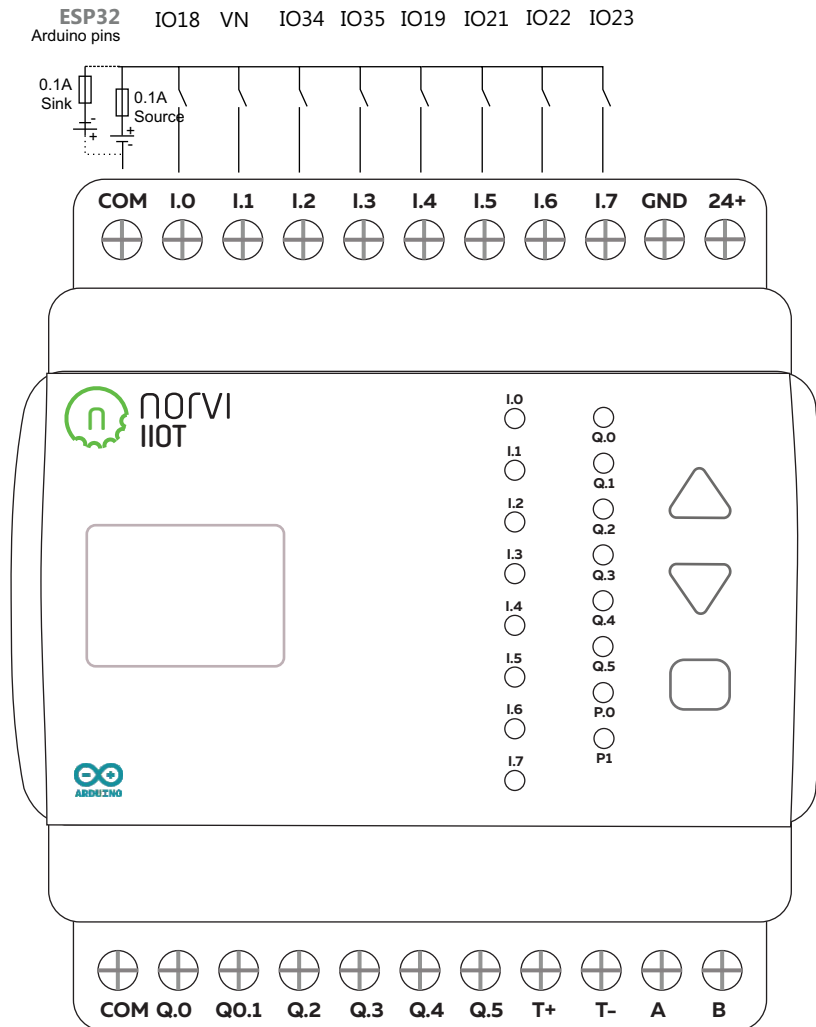
Discrete IO number	16
Number of Expansions	-----
Supply voltage limits	20.4....28.8V
Inrush current	<=50A
Power consumption in W	32.6.....40.4 with all outputs ON
Discrete logic input	Sink or source
Discrete input voltage	24V
Discrete input voltage type	DC
Voltage state 1 guaranteed	>=15 V for input
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 1 LED green for RUN 8 LED green for IO.....I7 6 LED green for R0.....R5 2 LED green for T0....T1
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

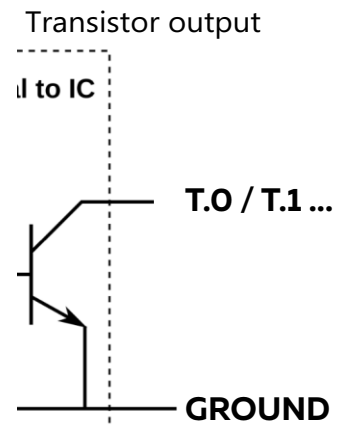
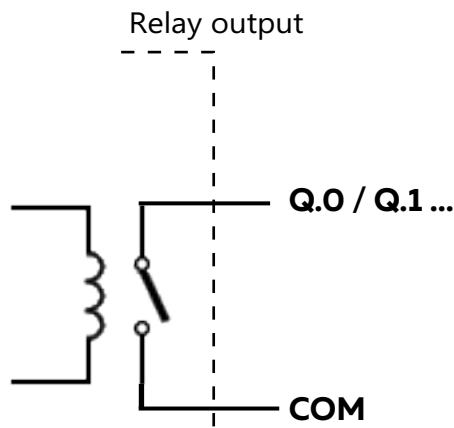
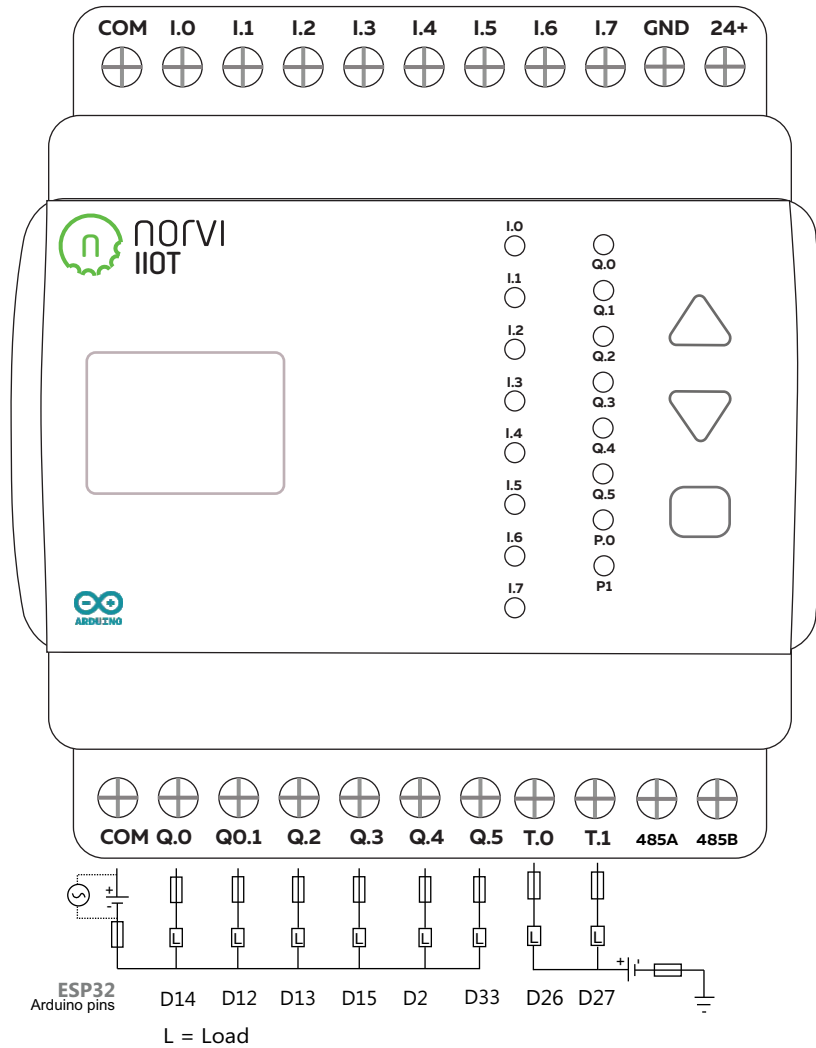
Resistance to electrostatic discharge	4kV on contact 8kV on air
Resistance to electro magnetic fields	10 V/m (80 MHz ..... 1GHz) 3 V/m (1.4 MHz ..... 2 GHz) 1 V/m (2 MHz ..... 3 GHz)
Immunity to microbreaks	10 ms
Relative humidity	10....95% without condensation in operation
IP degree of protection	IP20
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

24V DC Sink/Source

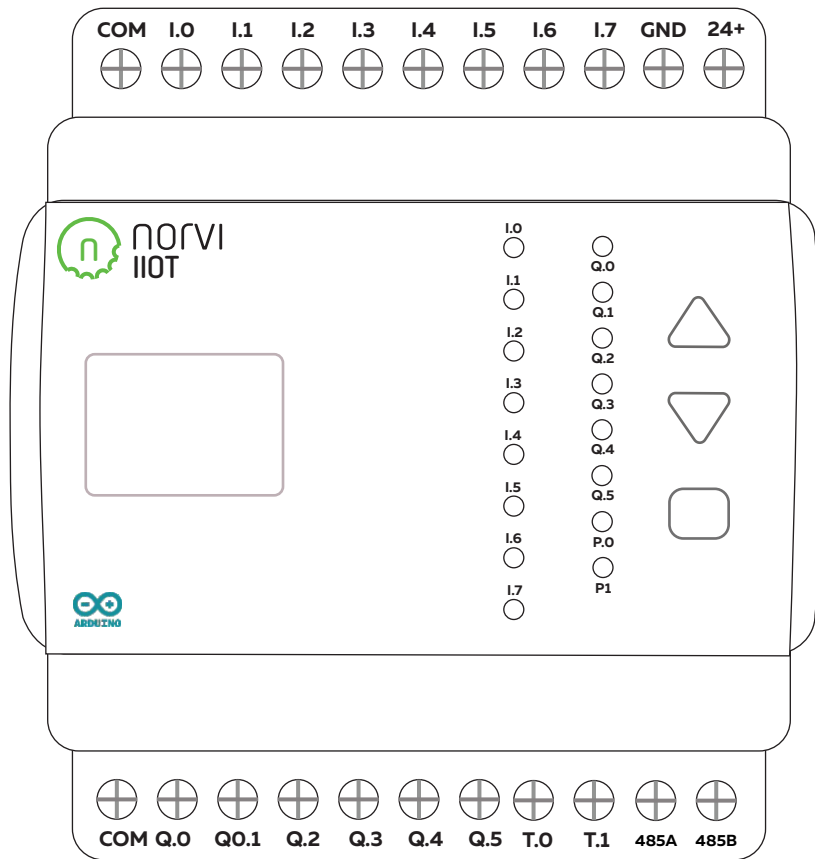


### Relay and Transistor outputs wiring diagram



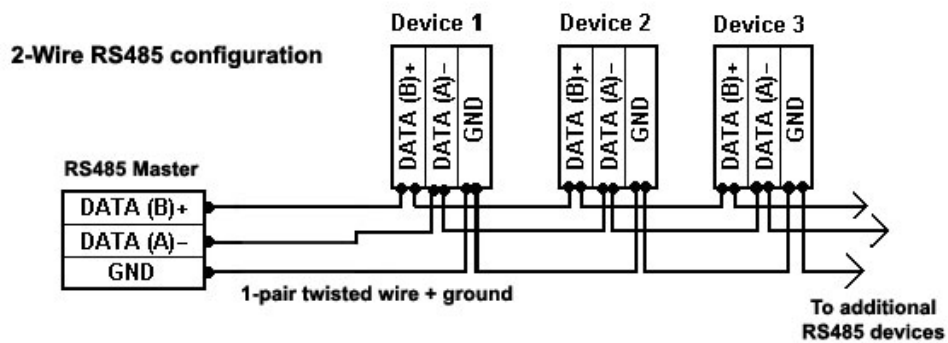
### RS-485 communication wiring diagram

Driver	MAX485
UART Connection	IO5 - RXD    IO25 - TXD
Flow Control	IO4



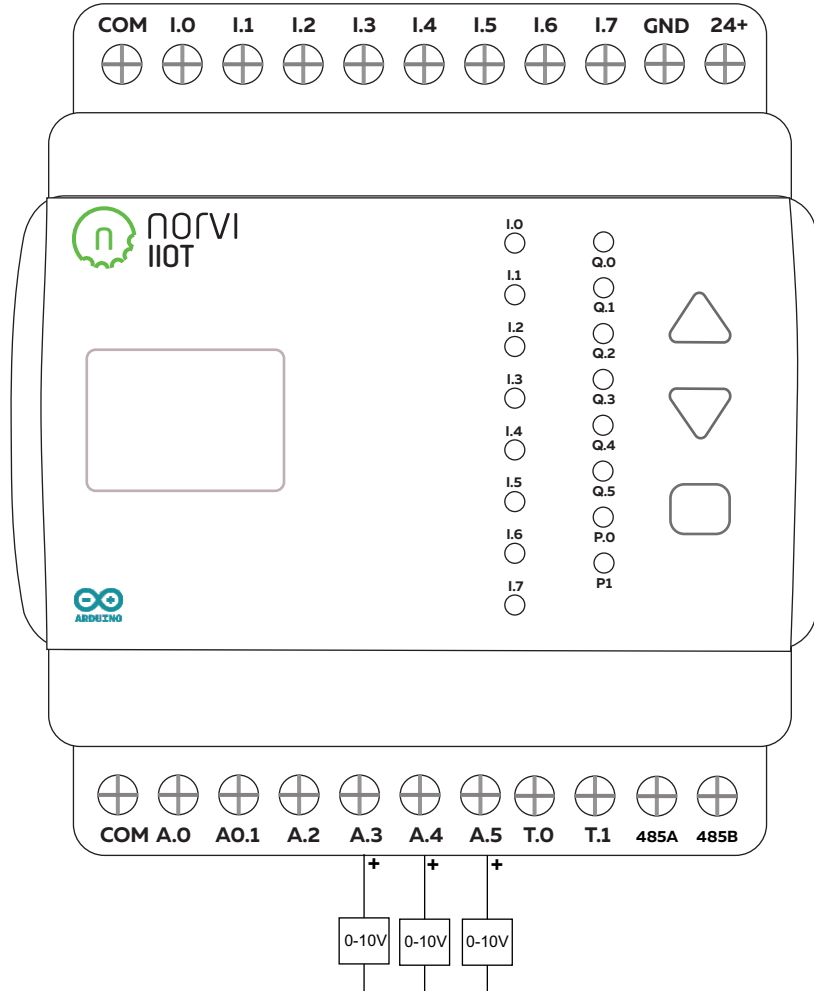
HALF-DUPLEX

Flow control  
Arduino pin D26

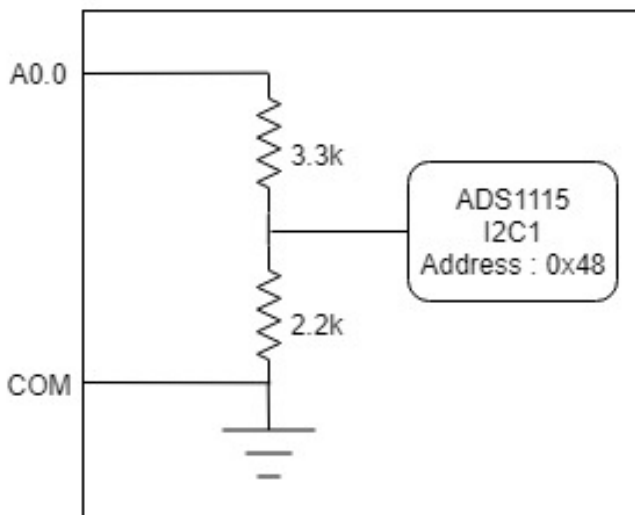


### Analog input wiring diagram (0-10V)

\*AE-02 / AE-03 Models Only



0 - 10 V input to 0 - 4V

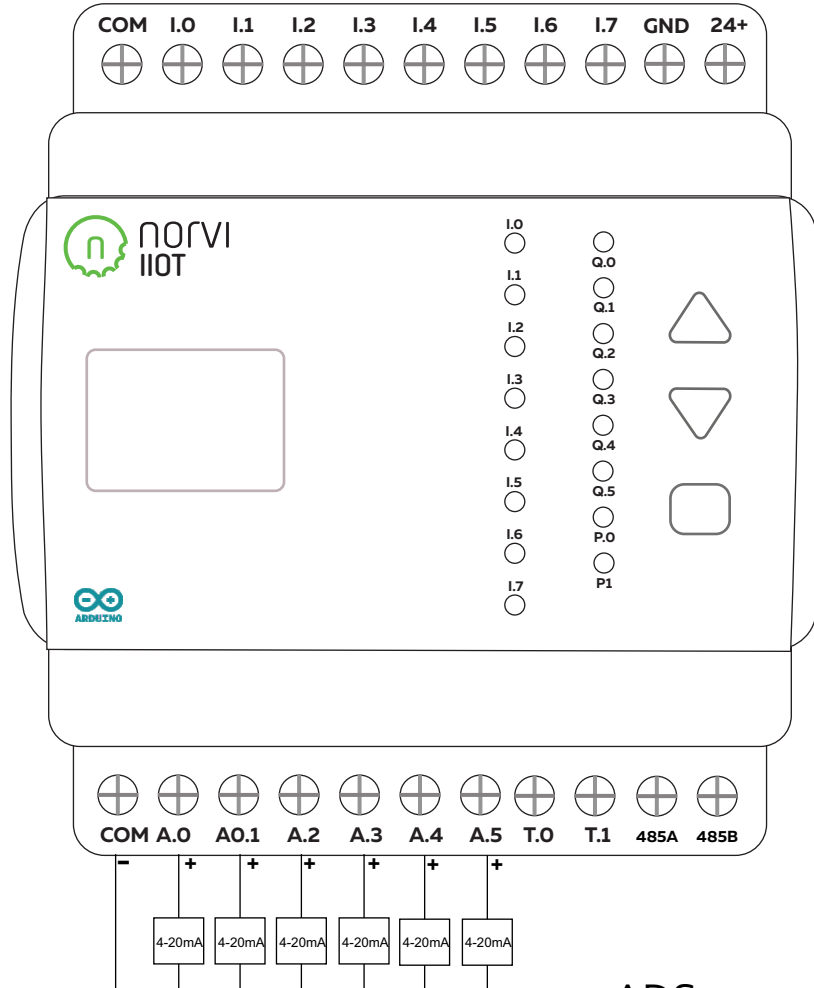


### ADS1115 connections

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

### Analog input wiring diagram (4-20mA)

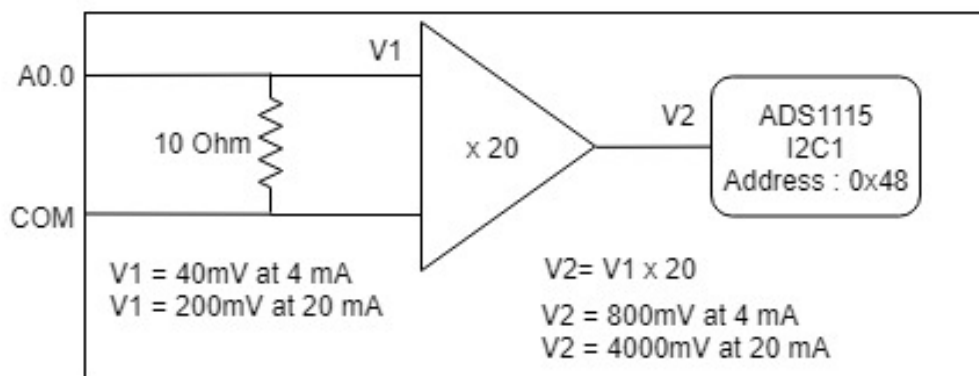
\*AE-02 / AE-03 Models Only



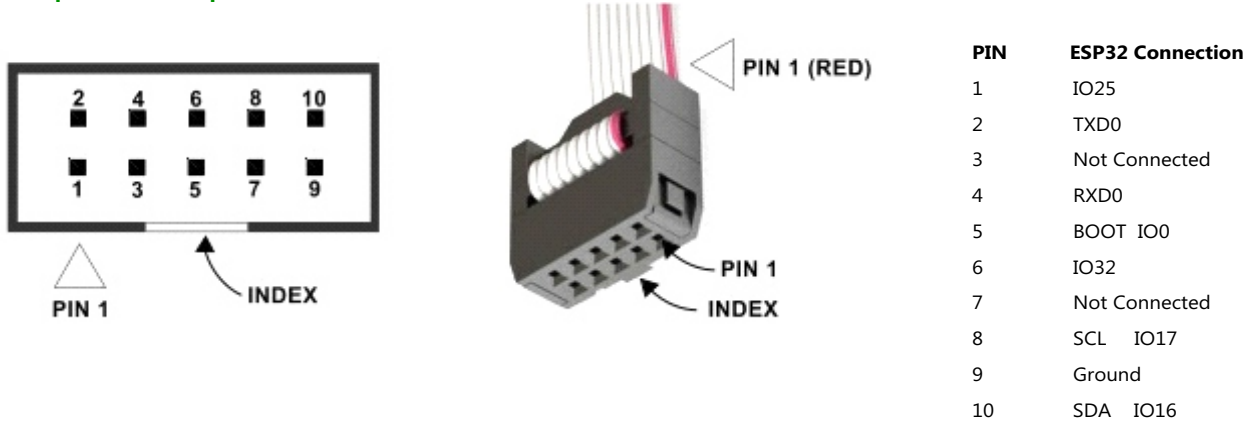
### ADS1115 connections

IC Type	ADS 1115
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Resolution	16 bit

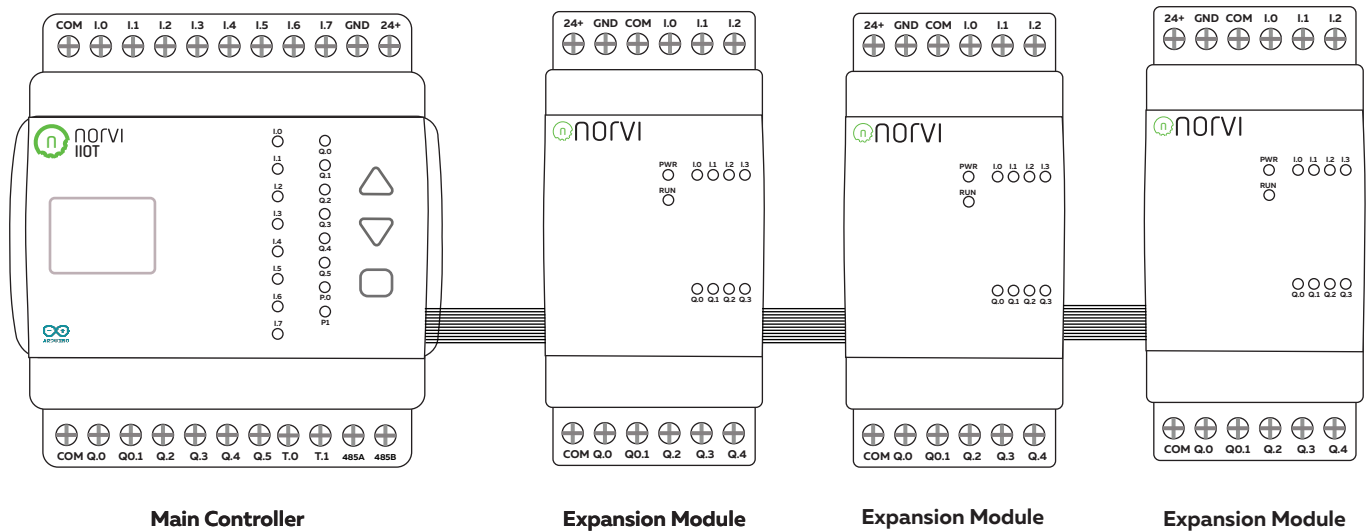
0 - 20mA to 0 to 4V



### Expansion port



### Expansion modules



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





### TFT Display parameters

Display driver	ST7789			
Communication	SPI IO18/IO19/IO23 SCK/MISO/MOSI			
Module Address	NA			
Resolution	80 x 160			
Connection	TFT_SCK	IO18	TFT_RST	IO32
	TFT_MOSI	IO23	TFT_DC	IO13
	TFT_CS	IO27		

### 0.96 OLED Display parameters

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

### RTC parameters

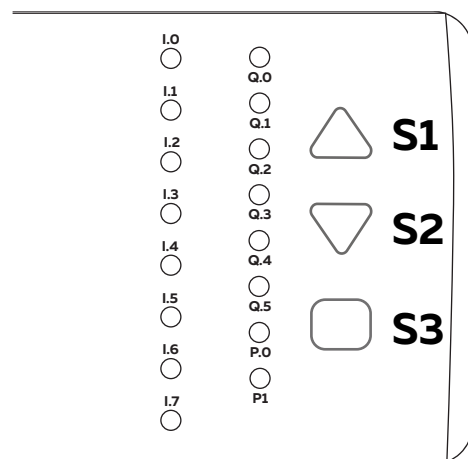
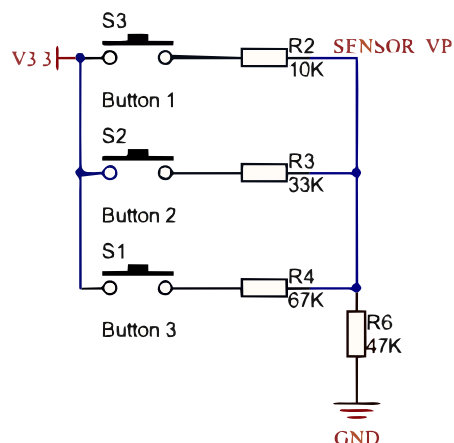
Display driver	DS3231	
Communication	I2C IO16(SDA) - IO17(SCL)	
Module Address	0x68	
Battery Backup	YES	

### microSD card access

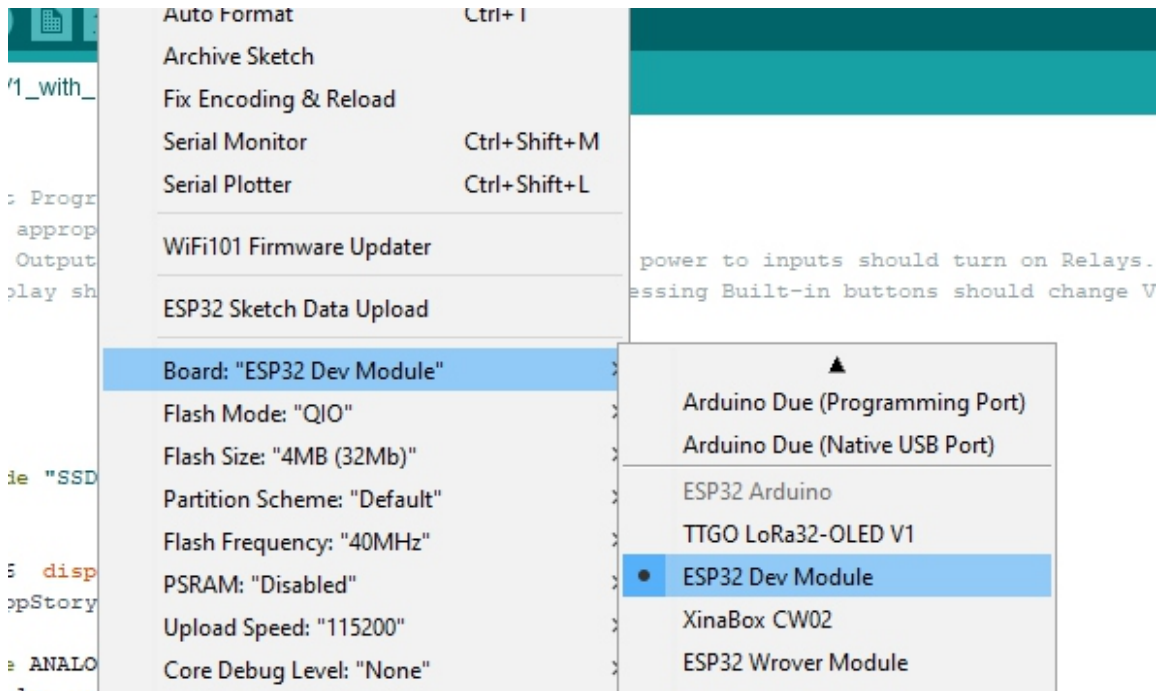
Connection	SCK	IO18	CS	IO5
	MISO	IO19	SD Detect	IO14
	MOSI	IO23		

### Built in buttons

Read mode	ADC (Analog to Digital Conversion)	
Analog IO	SENSOR_VP	
Voltage levels	3	

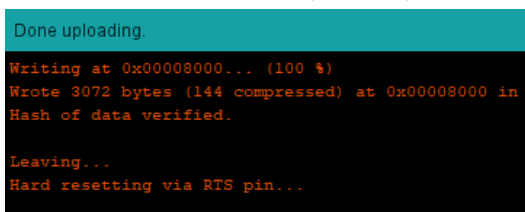


## Programming procedure



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.



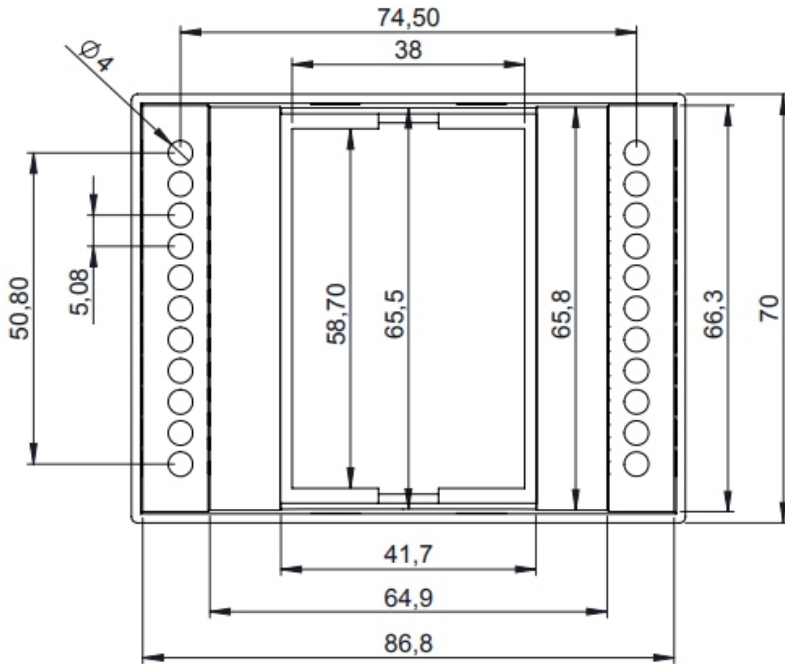
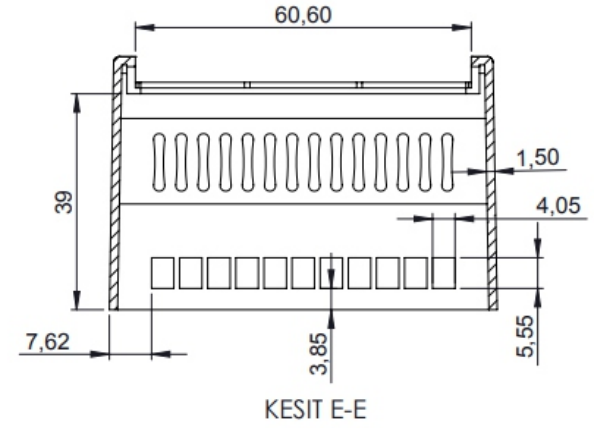
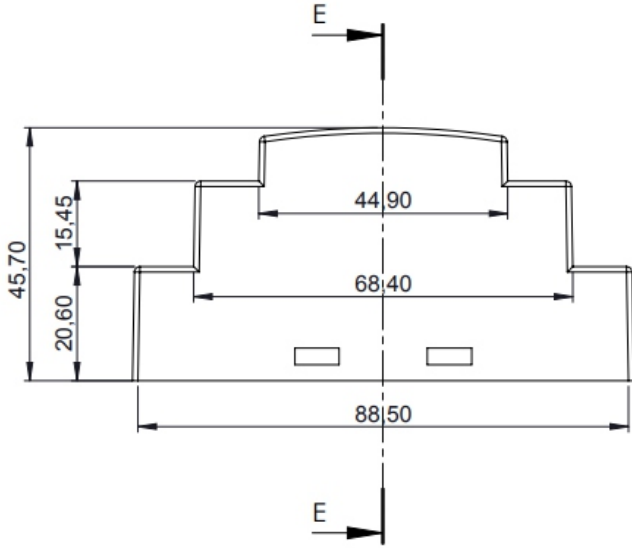
esp32 Boards must be installed under board manager, it is recommended to use the latest version of esp32 board driver for Arduino.

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





## Reach-Us

### ***Technical Support***

E-mail : [info@icd.lk](mailto:info@icd.lk)

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### ***Sales Inquiries***

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