

- 6 Digital Inputs
- 6 Analog Inputs
- 2 Transistor outputs
- RS-485 communication
- Built in OLED Display
- micro SD card support
- DS3231 RTC with batery backup



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	Smart Controls
Product type	Programmable Controller
Rated supply voltage	24V DC
Discrete input number	6 discrete input
Discrete output type	Relay and Transistor
Discrete output number	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

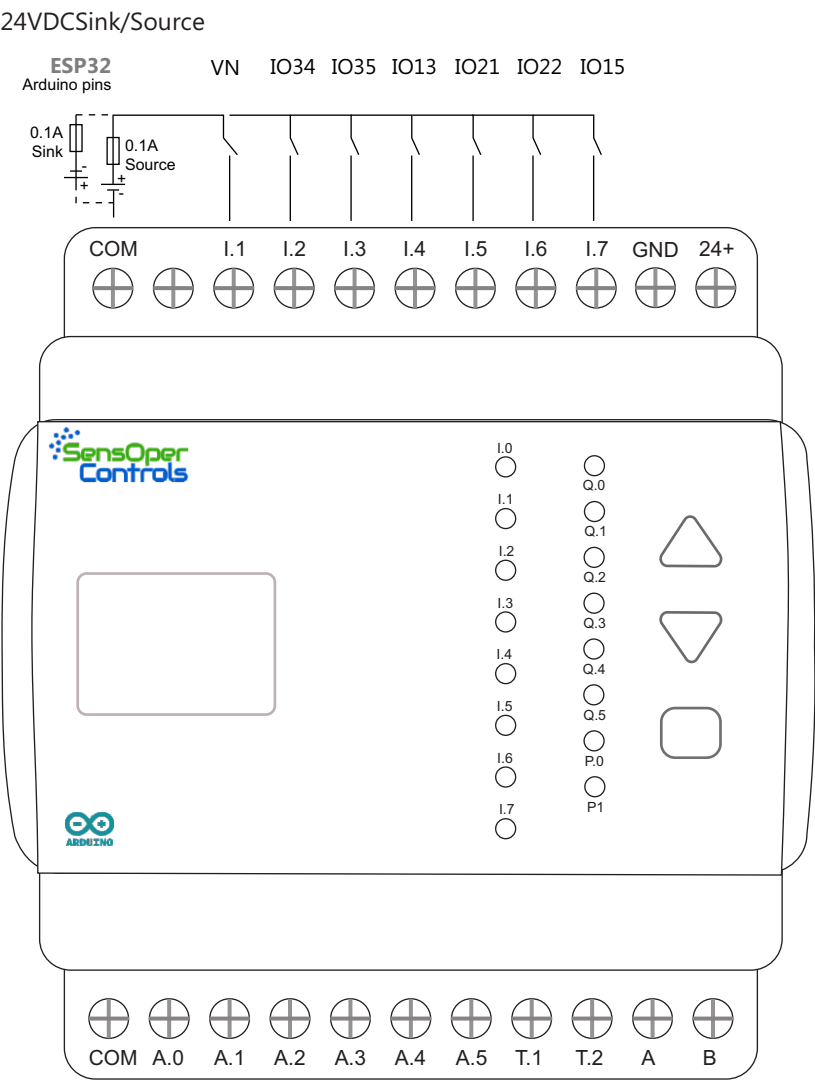
Complementary

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 8 LED green for I0.....I7 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

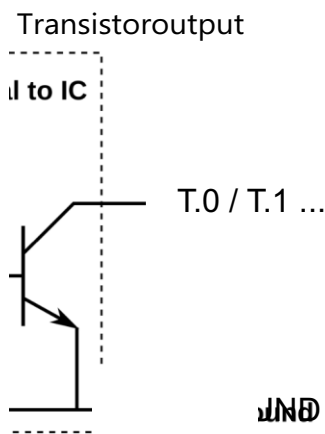
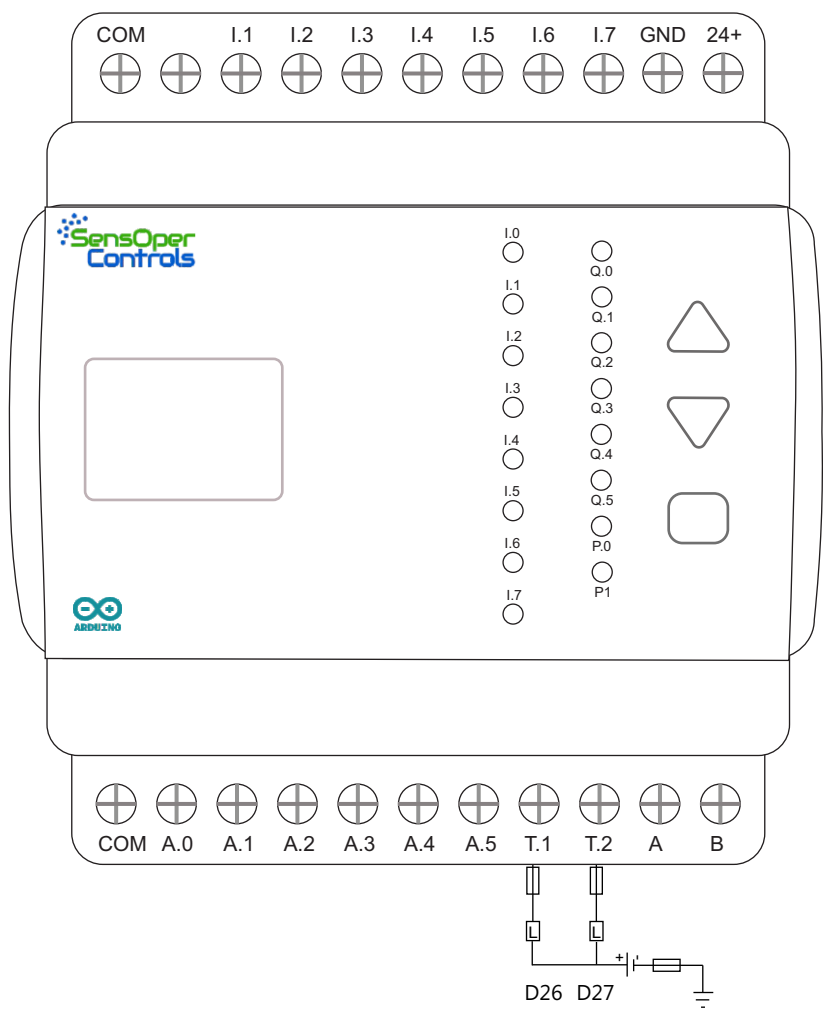
Environment

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 altitude	0...2000m
Storage altitude	0...3000m
Shock resistance	15 gn for 11 ms

Digital inputs wiring diagram

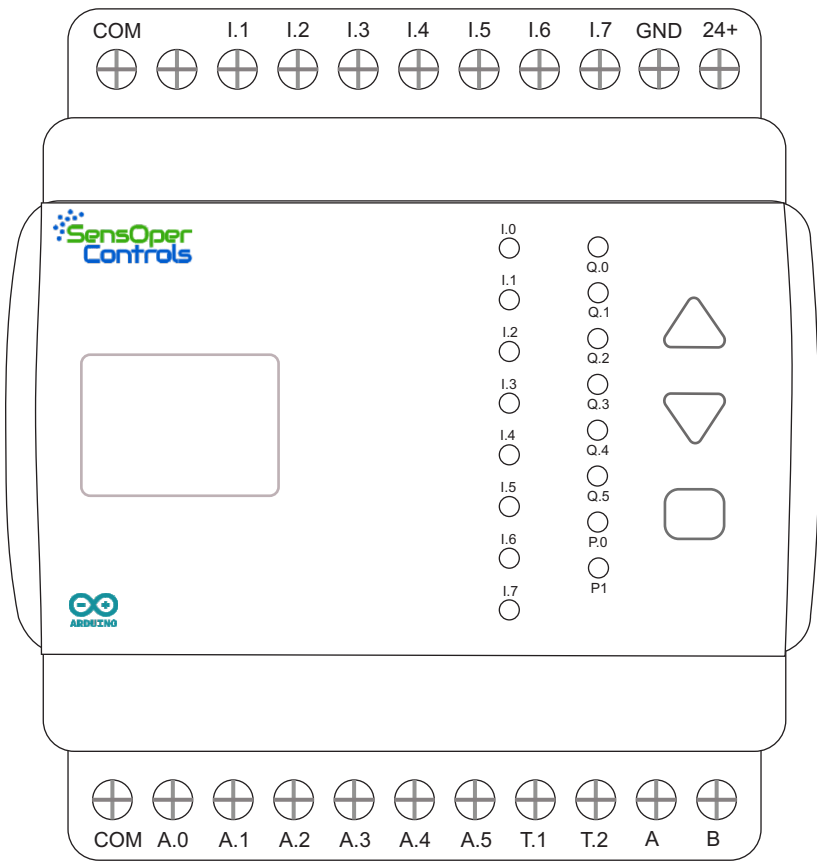


Relay and Transistor outputs wiring diagram

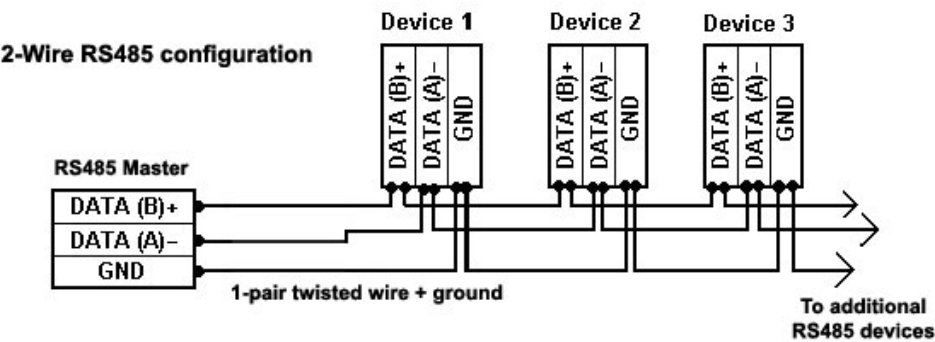


RS-485 communication wiring diagram

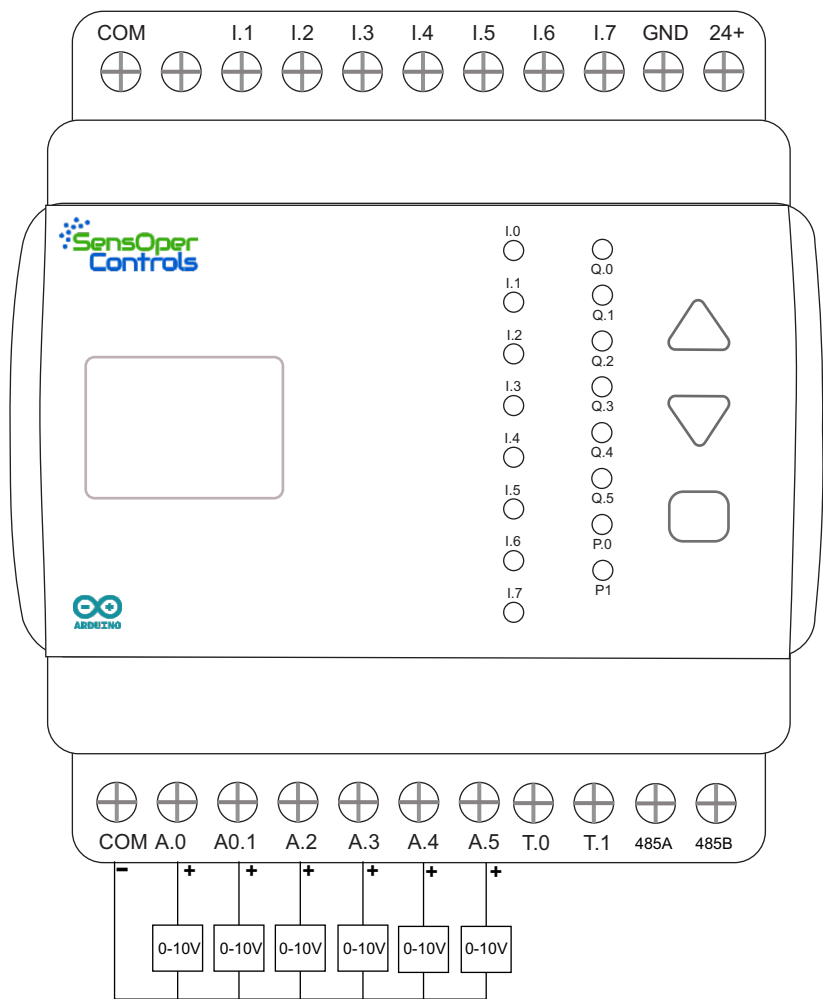
Driver	MAX485	
UART Connection	IO3 - RXD	IO1 - TXD
Flow Control	IO4	



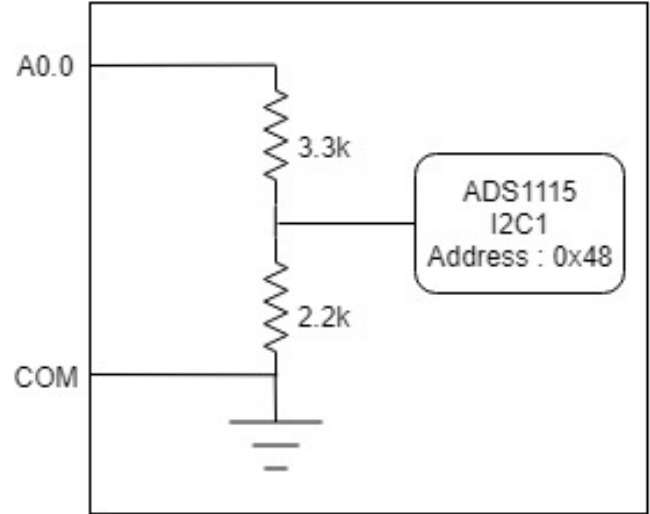
HALF-DUPLEX
Flow control
Arduino pin D26



Analog input wiring diagram (0-10V)



0 - 10 V input to 0 - 4V



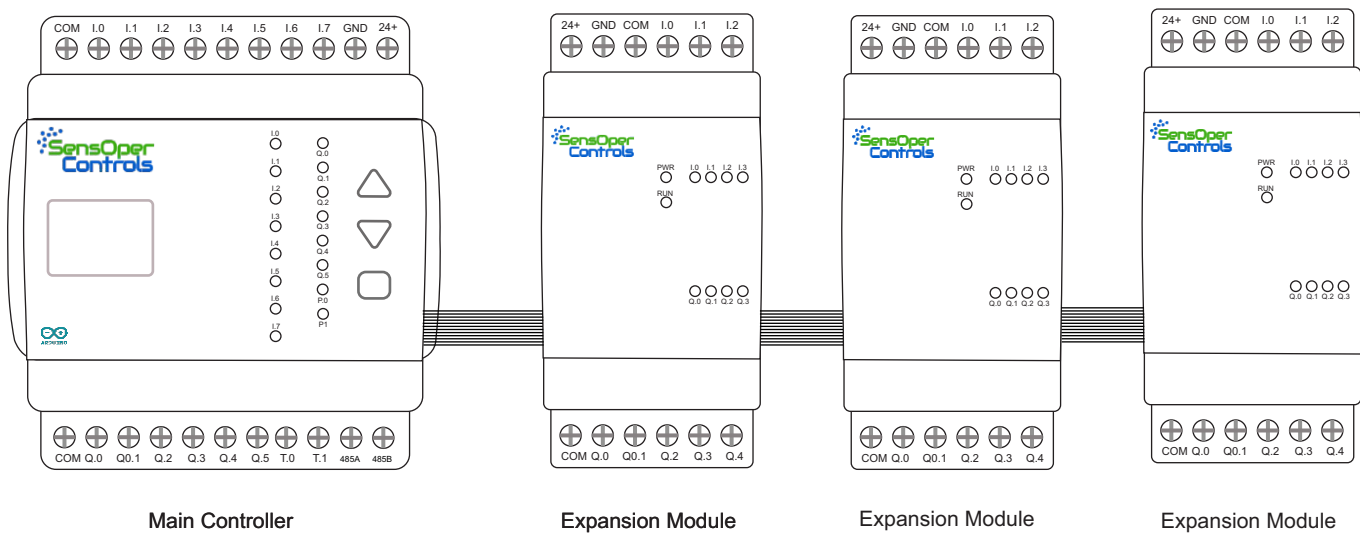
ADS1115 connections

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

Expansion port

PIN	ESP32 Connection
1	IO25
2	TXD0
3	Not Connected
4	RXD0
5	BOOT IO0
6	IO32
7	Not Connected
8	SCL IO17
9	Ground
10	SDA IO16

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



LoRa communications

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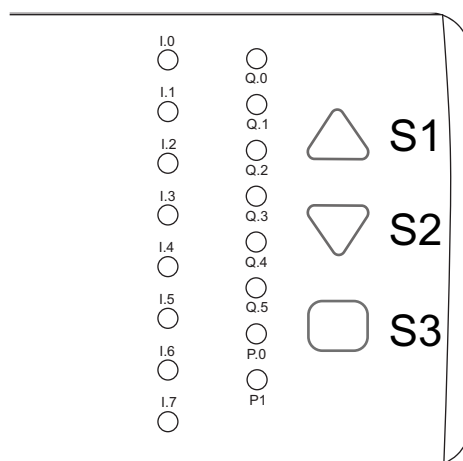
Display driver	SSD1306
Communication	I2C IO16(SDA) - IO17(SCL)
Module Address	0x3C
Resolution	128 x 64

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

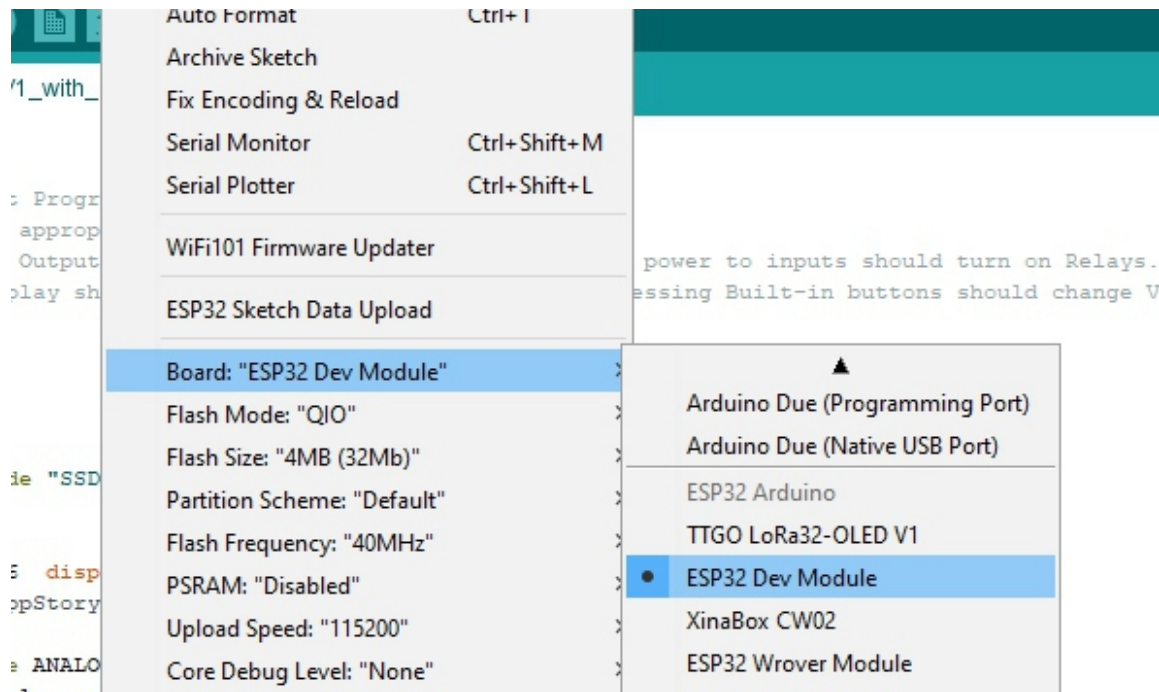
Connection	SCK	IO18	CS	IO5
	MISO	IO19	SD Detect	IO14
	MOSI	IO23		

Read mode	ADC (Analog to Digital Conversion)
Analog IO	GPIO 32

The diagram shows a 3-button sensor module circuit. It consists of three buttons labeled S1, S2, and S3, each connected to a common ground line through resistors R4 (67K), R3 (33K), and R2 (10K) respectively. The buttons are also connected to a 5V supply (V3.3) through resistors R2, R3, and R4. A common ground resistor R6 (47K) connects the bottom of the buttons to GND. The output of the buttons is labeled 'SENSOR VP'.

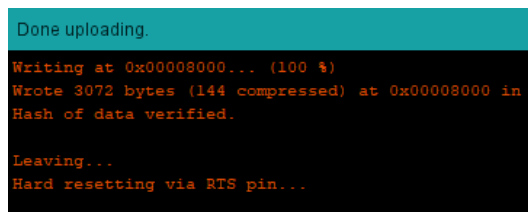


Programming procedure



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.



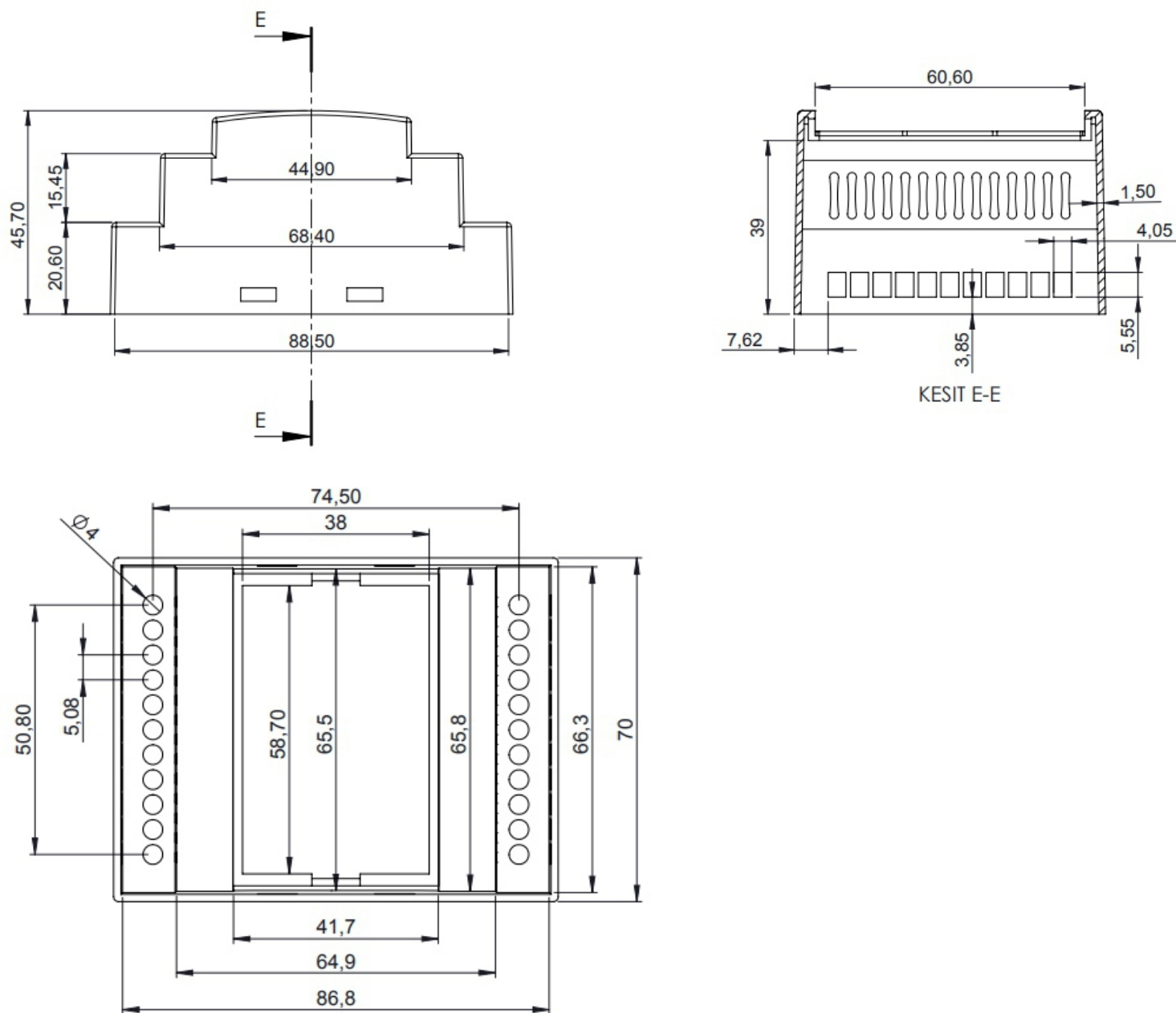
esp32 Boards must be installed under board manager, it is recommended to use the latest version of esp32 board driver for Arduino.

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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