

# Product datasheet

## Characteristics

# NORVI

## Agent 1



### BM01 Series

3 Digital Inputs  
3 Analog inputs 0 - 10V  
1 RS-485 Communication

### BT01 Series

3 Digital Inputs  
3 Analog inputs 0 - 10V  
2 Transistor outputs

### BT05 Series

3 Digital Inputs  
2 Analog inputs 0 - 10 V  
1 Relay output

### BM02 Series

3 Digital Inputs  
3 Analog inputs 4 - 20mA  
1 RS-485 Communication

### BT02 Series

3 Digital Inputs  
3 Analog inputs 4 - 20mA  
2 Transistor outputs

### BT06 Series

3 Digital Inputs  
2 Analog inputs 4 - 20mA  
1 Relay output

### BT03 Series

3 Digital Inputs  
2 Thermocouple inputs  
2 Transistor outputs

### Optional

micro SD card support  
DS3231 RTC with battery backup

### Communication Options



## Main

Range of product	NORVI Agent 1
Product type	Programmable node
Rated supply voltage	Standard 12 - 24V DC / Low Power : 3.3 - 6V DC
Field of Application	Monitoring and controlling
Discrete Input number	3
Discrete Input Voltage	18 - 24 V DC
Analog input number	3
Analog input range	0 - 10V DC / 0 - 20 mA (depending on model)
Communication	RS-485 (applicable or BE-Series only)
Analog input range	0 - 10V DC / 0 - 20 mA (depending on model)
Analog input controller	16 bit with PGA ADS-1115
Discrete output type	Transistor (applicable or BE-Series only)
Discrete output number	2 Transistor outputs
Discrete output voltage	24V DC for transistor output

## Complementary

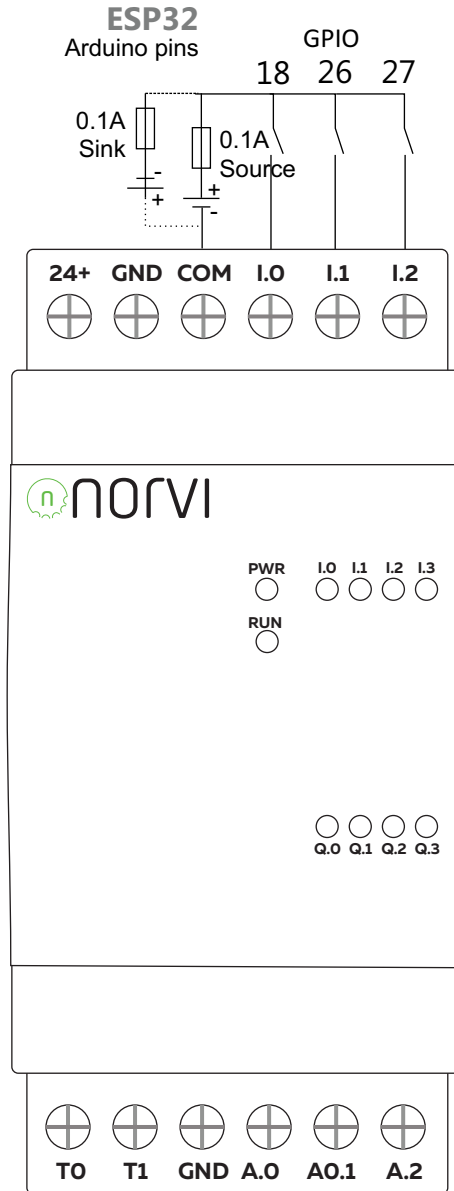
Local signalling	1 LED green for PWR 4 LED red for Digital Inputs 1 WS2812 pixel RGB Led
Electrical connection	Removable screw terminal block for inputs and outputs (pitch 5.08 mm)
Mounting support	Top hat type TH35-15 rail conforming to IEC 60715 Top hat type TH35-7.5 rail conforming to IEC 60715
Height	86.00 mm
Depth	59.00 mm
Width	35.00 mm
Product weight	0.91 Kg

### Environment

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
Operating temperature	-40 to +85 'C

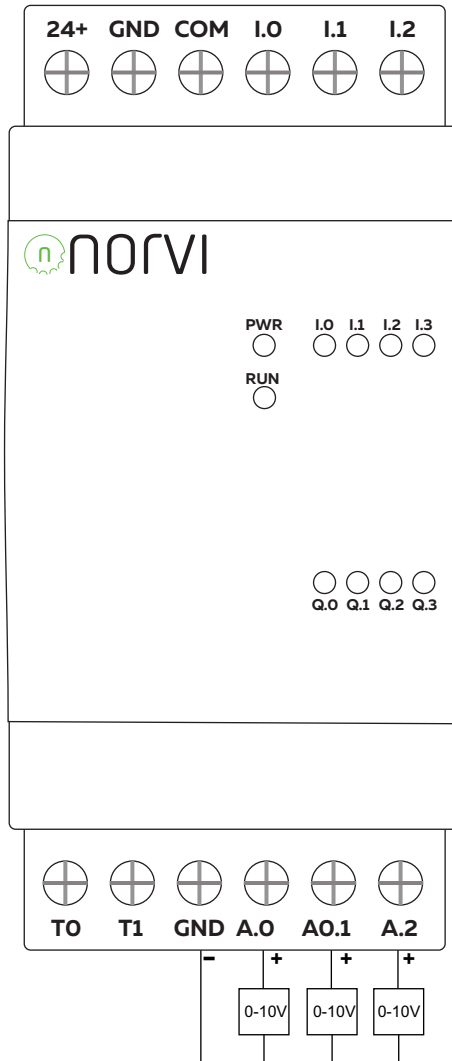
### Digital inputs wiring diagram

#### 24V DC Sink/Source



### Analog Inputs wiring diagram

0 - 10 V DC



### ADS1115 connections

IC Type	ADS 1115
Communication	I2C/ SDA IO21 SCL IO22
Module Address	0x48
Resolution	16 bit

### Programming

Library Adafruit ADS1115

[Edit to the library](#)

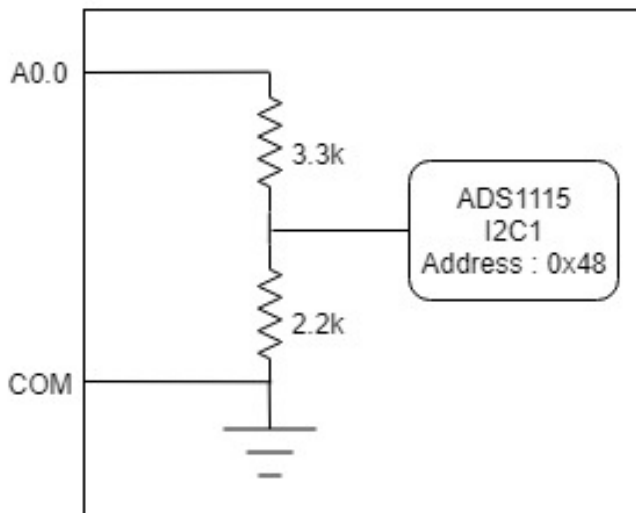
File: Adafruit\_ADS1015.cpp

Function Adafruit\_ADS1015::begin()

Change :

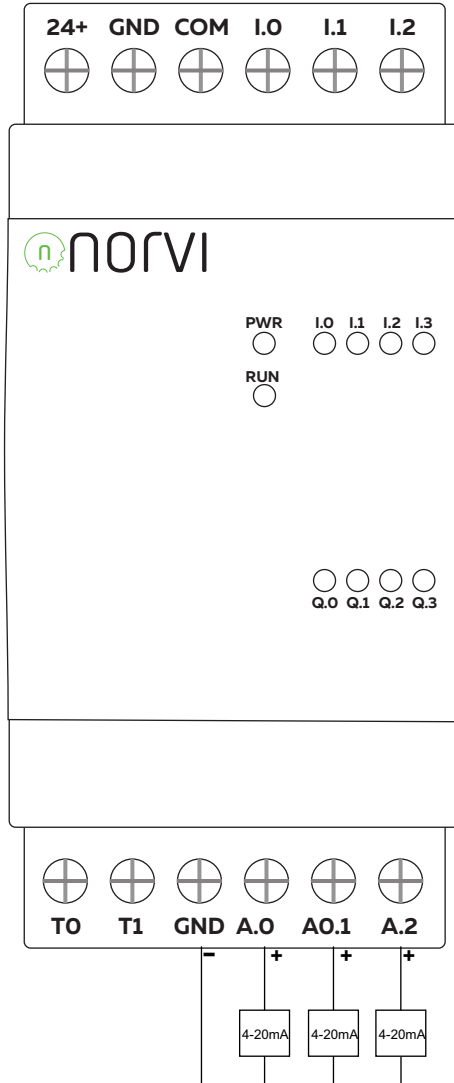
Wire.begin() to Wire.begin(21,22);

### 0 - 10 V input to 0 - 4V



### Analog Inputs wiring diagram

0 - 20mA DC



### ADS1115 connections

IC Type	ADS 1115
Communication	I2C/ SDA IO21 SCL IO22
Module Address	0x48
Resolution	16 bit

### Programming

Library Adafruit ADS1115

[Edit to the library](#)

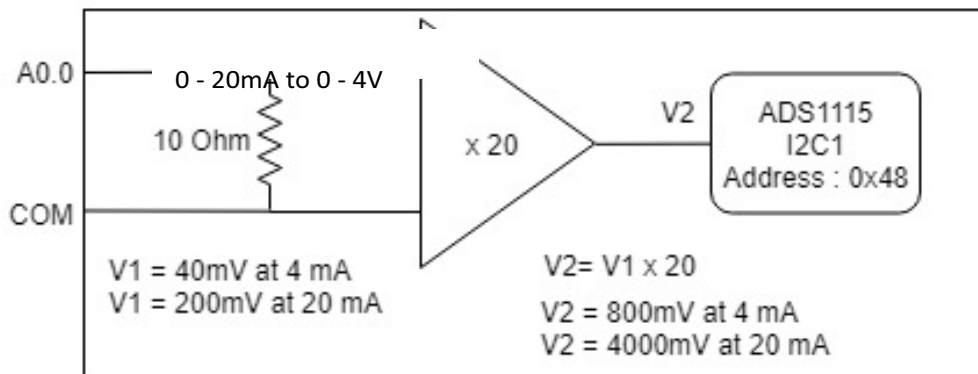
File: Adafruit\_ADS1015.cpp

Function Adafruit\_ADS1015::begin()

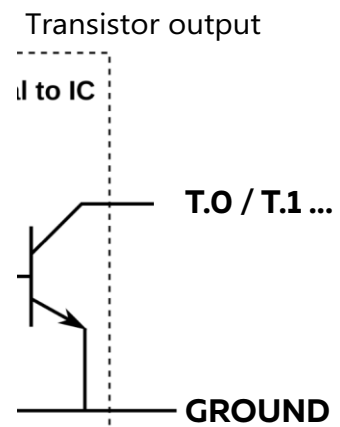
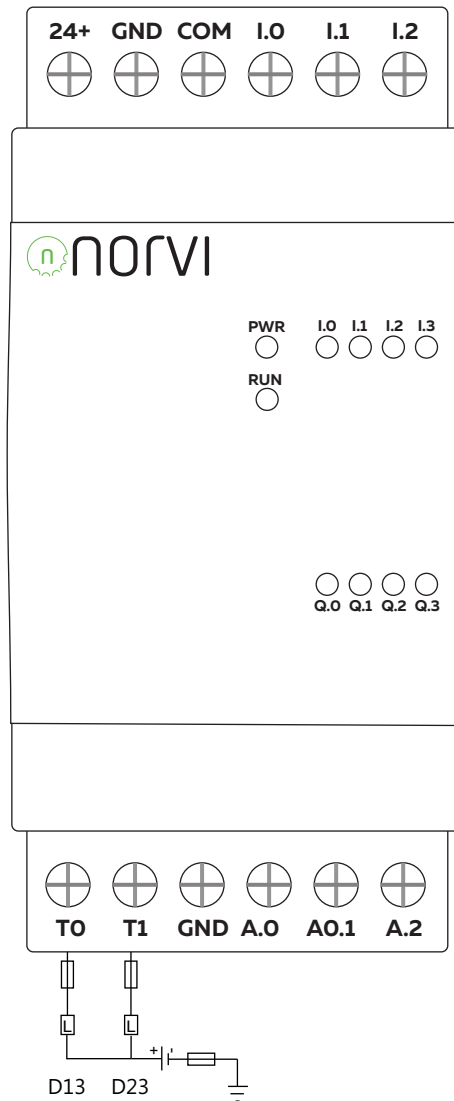
Change :

Wire.begin() to Wire.begin(21,22);

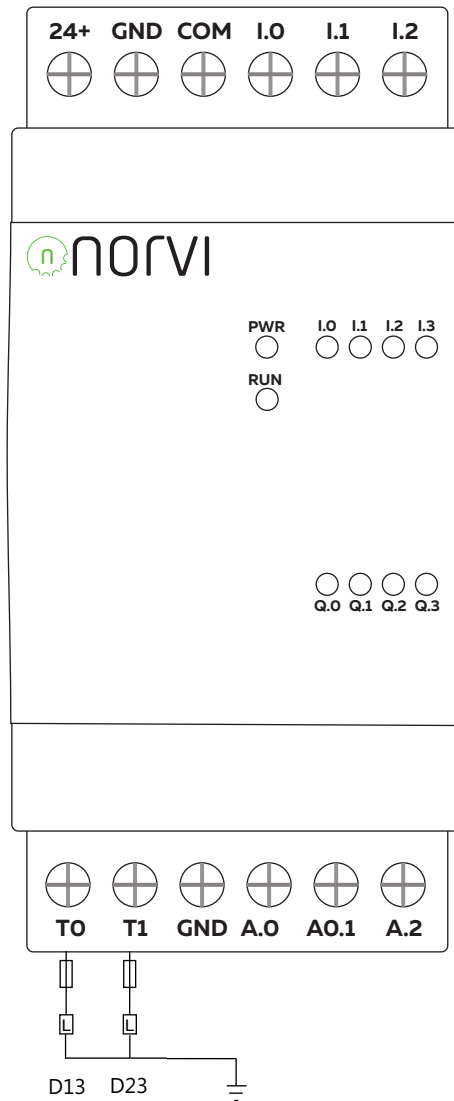
### 0 - 10 V input to 0 - 4V



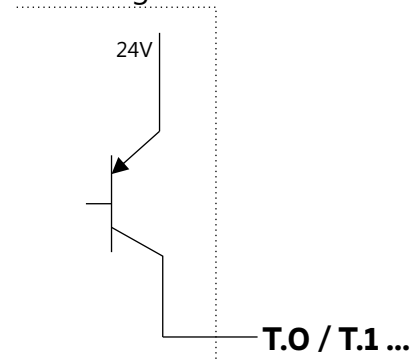
### Transistor outputs wiring diagram



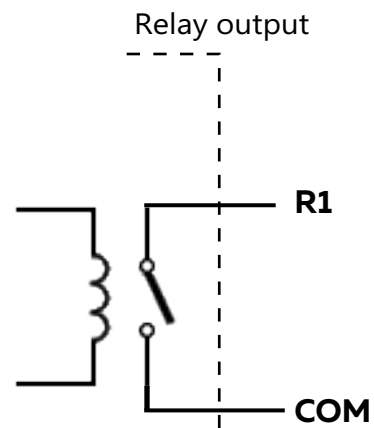
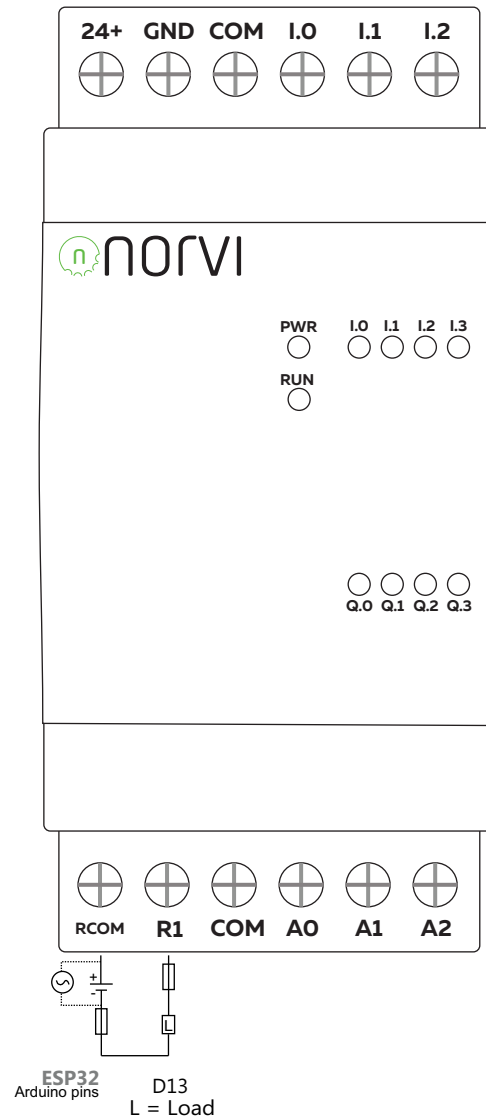
### Transistor outputs High Side Switch AT01-BT1 / AT01-BT2 / AT01-BT3



Transistor output  
High-side switch

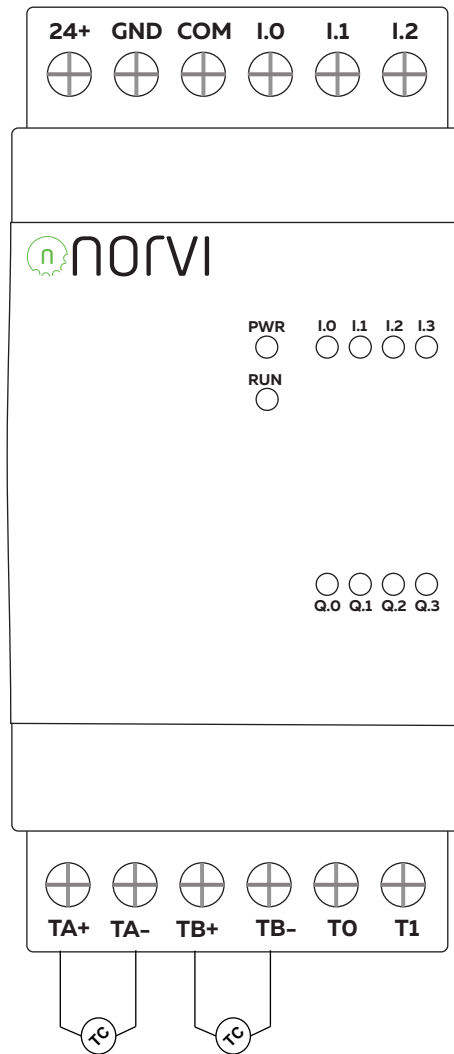


### Relay output





### Thermocouple wiring diagram

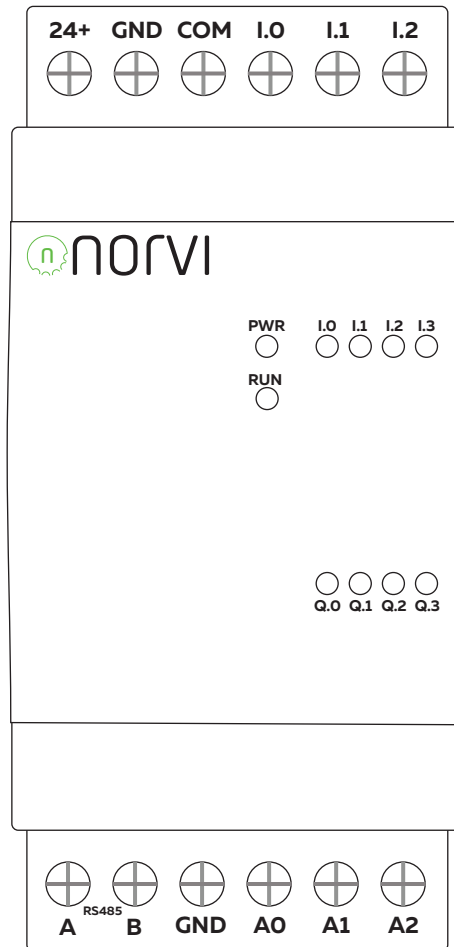


### MAX31855 connections

IC Type	MAX31855		
Communication	SPI	SCK	IO18
		MISO	IO19
		CS	IO6

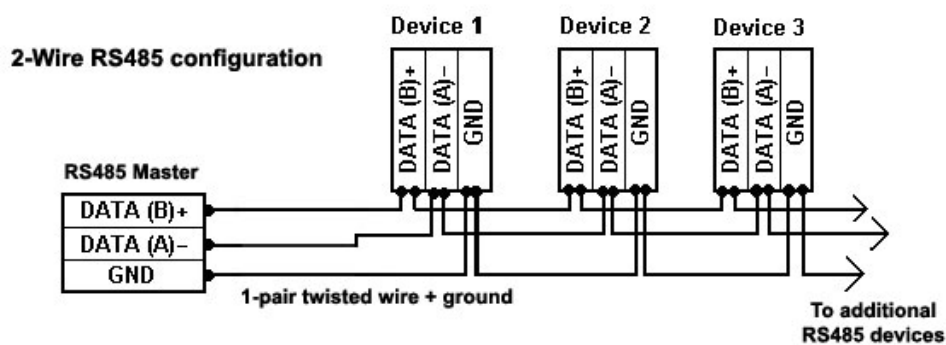
### RS-485 wiring diagram

IC Type	MAX485		
Communication	UART TX	IO13	
	RX	IO23	
	FC	IO17	



HALF-DUPLEX

Flow control  
IO17



### RTC parameters

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Display driver	DS3231
Communication	I2C IO21(SDA) - IO22(SCL)
Module Address	0x68
Battery Backup	YES

### Built in buttons

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Read mode	Digital Input IO 35
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### Pixel RGB LED

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Module Type	WS2812
Communication	One wire
Connection	IO 25

### NB-IoT Module communication

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Module Type	QUECTEL BC95-G
Communication	UART
Module Address	NA
Command set	AT
Connection	UART0 (RXD0, TXD0)

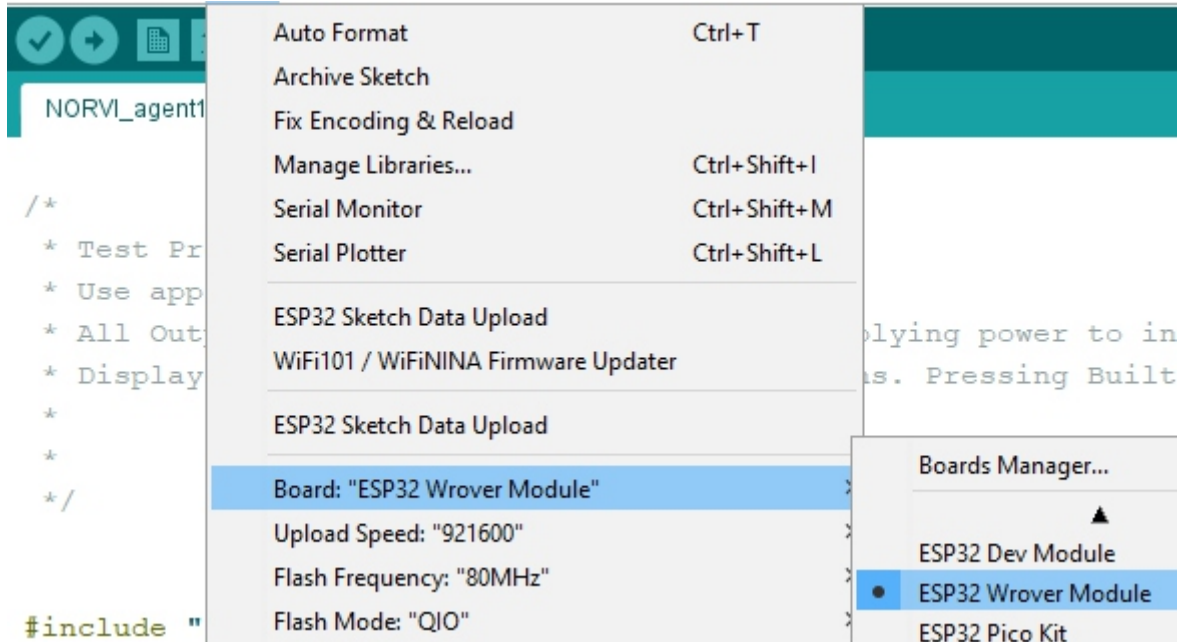
### LoRa Module communication

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Module Type	RLYR894   RLYR406 (Order depending on regional regulations)
Communication	UART
Module Address	NA
Command set	AT
Connection	UART0 (RXD0, TXD0)

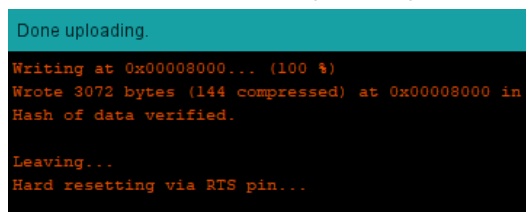
Example program and libraries available at  
<https://norvi.lk/forums>

### Programming procedure



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

After successful uploading of program following message appears.



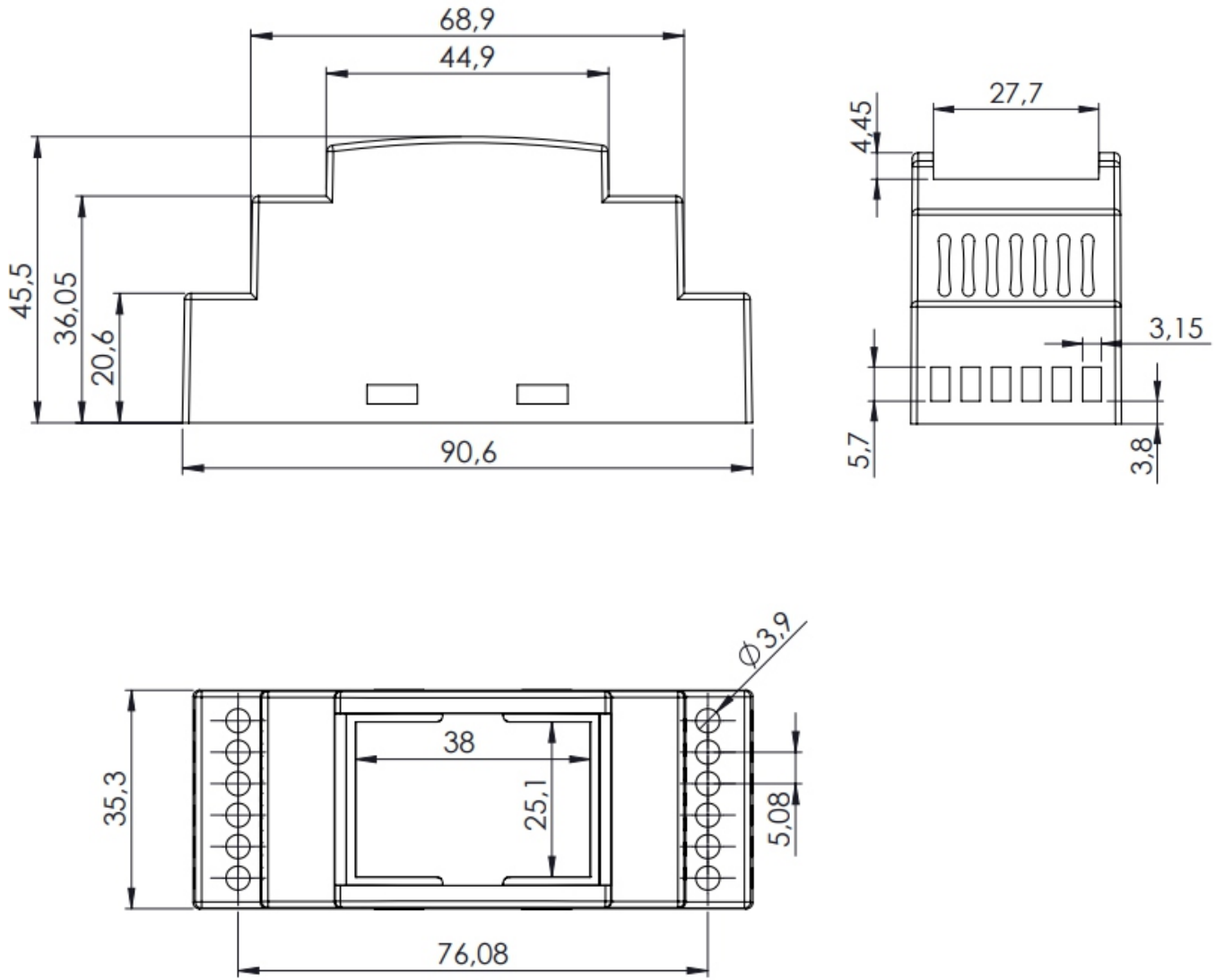
esp32 Boards must be installed under board manager, it is recommended to use the latest version of esp32 board driver for Arduino.

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***

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