

# DATASHEET

NORVI CONTROLLERS  
NORVI-GSM-AE04-I-L

## Product Features

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

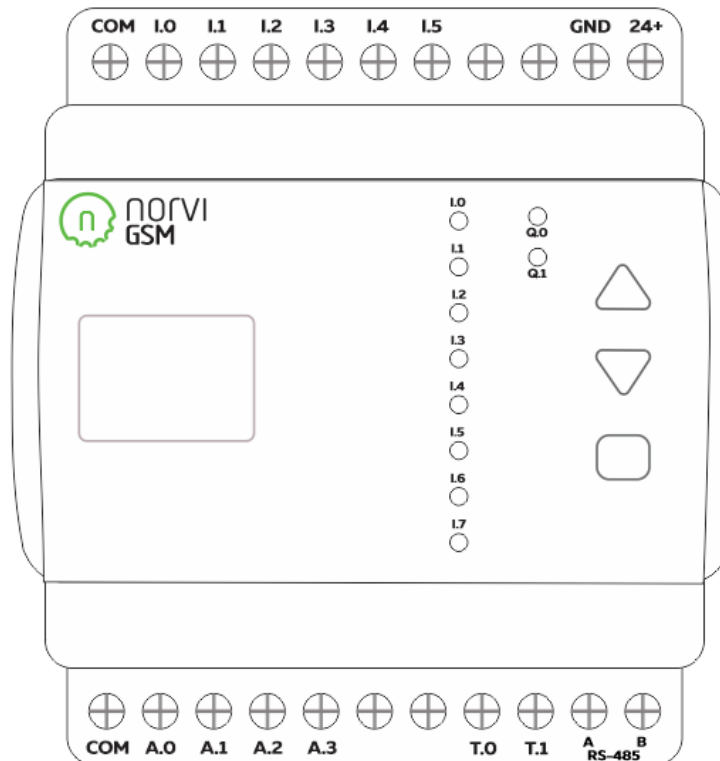


## Cellular Communication

Module	SIM7500-E
Brand Name	SIMCom
FCC ID	UDV-201606
TAC	86147503

## Expansions Supported

- Analog Input
- Digital Input
- Transistor Output
- Relay Output
- Analog Output



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## 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 LTE / EDGE - Quectel EC21 RS-485
Inputs and Outputs	6 x Digital Inputs 4 x Analog Inputs 4 - 20mA 2 x Transistor Outputs
Displays and Visual Indicators	0.96 OLED Display and Indicators

## Product Identification

Product Unified Code	NORVI-GSM-AE04-I-L
Product Part Numbers	NORVI-GSM-AE04-I-L

## Mechanical Properties

Enclosure	NORVI 204
Mounting / Installation Method	DIN RAIL / MOUNTING TABS
Terminal Type	SCREW TERMINAL
Terminal Arrangement	Top and Bottom
Length	91.0 mm
Height	58.4 mm
Width	70.0 mm

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## Environment

IP degree of protection	IP20
Operating altitude	0 - 2000 meters
Operating Temperature	- -10 ... +85° C (14...185 °F)
Storage altitude	0 - 2000 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)	12 ~ 24V DC
Current Consumption (mA)	400mA
Recommended Power Source	1A 24V DC

## Processing

SOC / MCU	ESP32-WROOM32
Flash Memory	4MB
ROM	448 KB
SRAM	520 KB
PSRAM	NOT AVAILABLE

## Peripherals

### microSD Card support

Card Type	microSD
Interface	SPI
SD CARD CS	GPIO5
MISO	GPIO19
MOSI	GPIO23
SCLK	GPIO18

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SD Detect	NOT CONNECTED
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## Internal RTC

RTC Chip	DS3231
Backup Battery Type	CR2032
Interface	I2C
I2C Address	0x68
SCL Pin	GPIO17
SDA Pin	GPIO16
RESET Pin	GPIO21

## Built-in Buttons

Button 1 Pin	GPIO36 Analog Input Level 1
Button 2 Pin	GPIO36 Analog Input Level 2
Button 3 Pin	GPIO36 Analog Input Level 3

## OLED Display

Display Driver	SSD1306
Display Size	0.96 inch
SCL Pin	GPIO17
SDA Pin	GPIO16
RESET Pin	NOT CONNECTED

## INPUTS and OUTPUTS

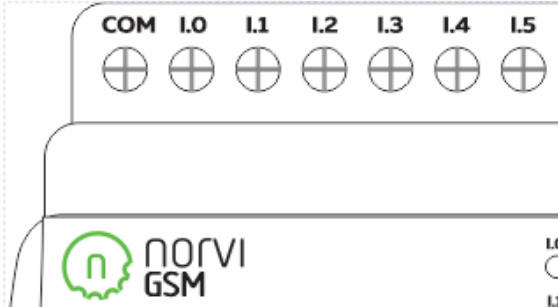
### Digital Inputs

Number of Digital Inputs	6
Digital Input Polarity	Supports both Sink and Source
Digital Input Maximum Voltage	32V DC
Digital Input Minimum Voltage	18V DC
Maximum Switching Frequency	1 kHz

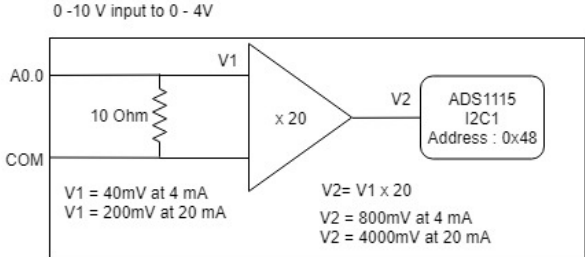
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Terminal Arrangement	 <p>I0 - Digital Input 0          I1 - Digital Input 1          I2 - Digital Input 2          I3 - Digital Input 3          I4 - Digital Input 4          I5 - Digital Input 5</p>
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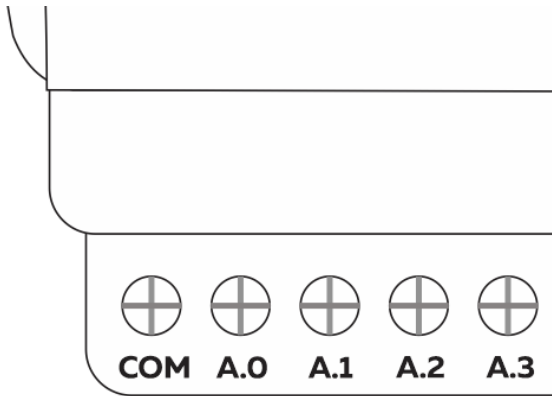
## Analog Inputs

Number of Analog Inputs	4
Analog Input Measurement Range	4 - 20mA
Analog Input Maximum Voltage	38V DC
Analog to Digital Converter (ADC)	ADS1115
Analog to Digital Converter (ADC) Communication	I2C
Analog to Digital Converter (ADC) Address	0x48
Internal Schematic	 <p>0 - 10 V input to 0 - 4V</p> <p>V1 = 40mV at 4 mA          V1 = 200mV at 20 mA</p> <p>V2 = V1 x 20          V2 = 800mV at 4 mA          V2 = 4000mV at 20 mA</p>

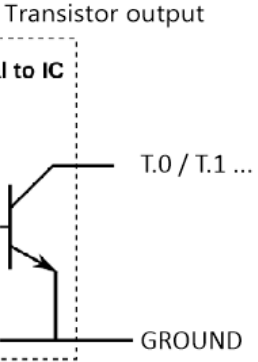
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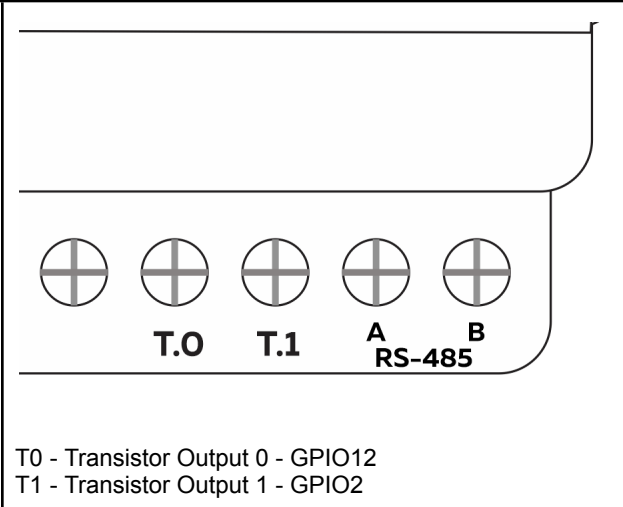
Terminal Arrangement	 <p>I0 - Analog Input 0 - ADS1115 Channel 0 I1 - Analog Input 1 - ADS1115 Channel 1 I2 - Analog Input 2 - ADS1115 Channel 2 I3 - Analog Input 3 - ADS1115 Channel 3</p>
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## Transistor Outputs

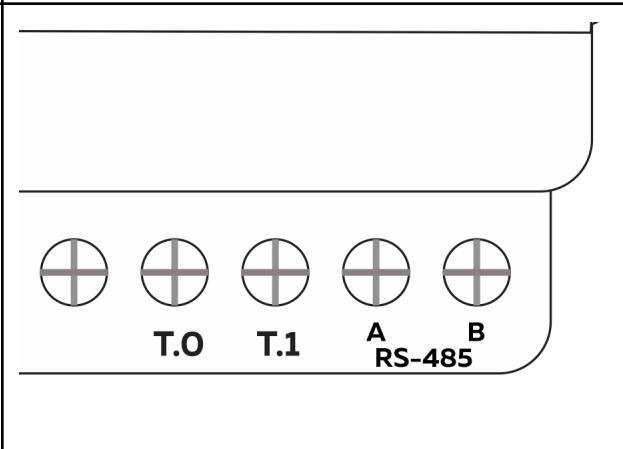
Number of Transistor Outputs	2
Transistor Output Type	OPEN COLLECTOR
Maximum Sink/Source Current (mA)	100mA
Maximum Applicable Voltage	36V DC
Maximum Switching Frequency	1 kHz
Internal Schematic	 <p>Transistor output</p> <p>I to IC</p> <p>T.0 / T.1 ...</p> <p>GROUND</p>

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Terminal Arrangement	 <p>T0 - Transistor Output 0 - GPIO12 T1 - Transistor Output 1 - GPIO2</p>
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## Communication Channels RS-485 Communication

Communication Mode	HALF-DUPLEX
Transceiver	MAX485
Unit Load	1/4
Flow Control / Direction Control Pin	GPIO22
TX Pin	GPIO26
RX Pin	GPIO25
Terminal Arrangement	

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## GSM / LTE Communication

Model of GSM Modem	SIM7500A
Manufacturer	SIMCom
FCC ID	UDV-201606
TAC	86147503
Method of Handling	AT Command over UART
Default Baud Rate	115200 bps
RESET Pin	GPIO21
TX Pin	GPIO33
RX Pin	GPIO32



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## GPIO Map

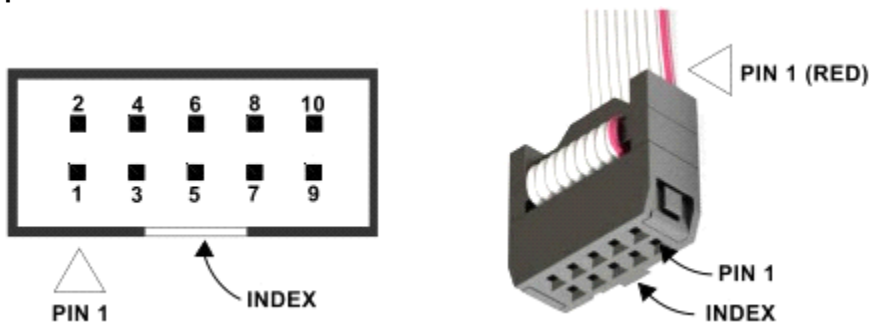
GPIO	Description	Usage
0	outputs PWM signal at boot	NRST
1	debug output at boot	RX0 - USB
2	connected to on-board LED	OUTPUT 2 (Transistor)
3	HIGH at boot	RX0 - USB
4		
5	outputs PWM signal at boot	Digital Input 5
6	connected to the integrated SPI flash	
7	connected to the integrated SPI flash	
8	connected 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	OUTPUT 1 (Transistor)
13		Digital Input 4
14	outputs PWM signal at boot	Digital Input 3
15	outputs PWM signal at boot	Chip Select - microSD
16		SDA - I2C
17		SCL - I2C
18		SCLK - microSD
19		MISO - microSD
21		RESET GSM Module
22		RS-485 Flow Control
23		MOSI - microSD
25		RS-485 - RXD
26		RS-485 - TXD
27		
32		RX- GSM Module

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33		TX - GSM Module
34	input only	Digital Input 1
35	input only	Digital Input 2
36	input only	<b>Front Panel Buttons</b>
39	input only	Digital Input 0

## Expansion Port



PIN	ESP32 Connection
1	NOT CONNECTED
2	TXD0
3	5V DC
4	RXD0
5	BOOT IO0
6	NOT CONNECTED
7	3.3V DC
8	SCL - GPIO17
9	GROUND
10	SDA - GPIO16

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