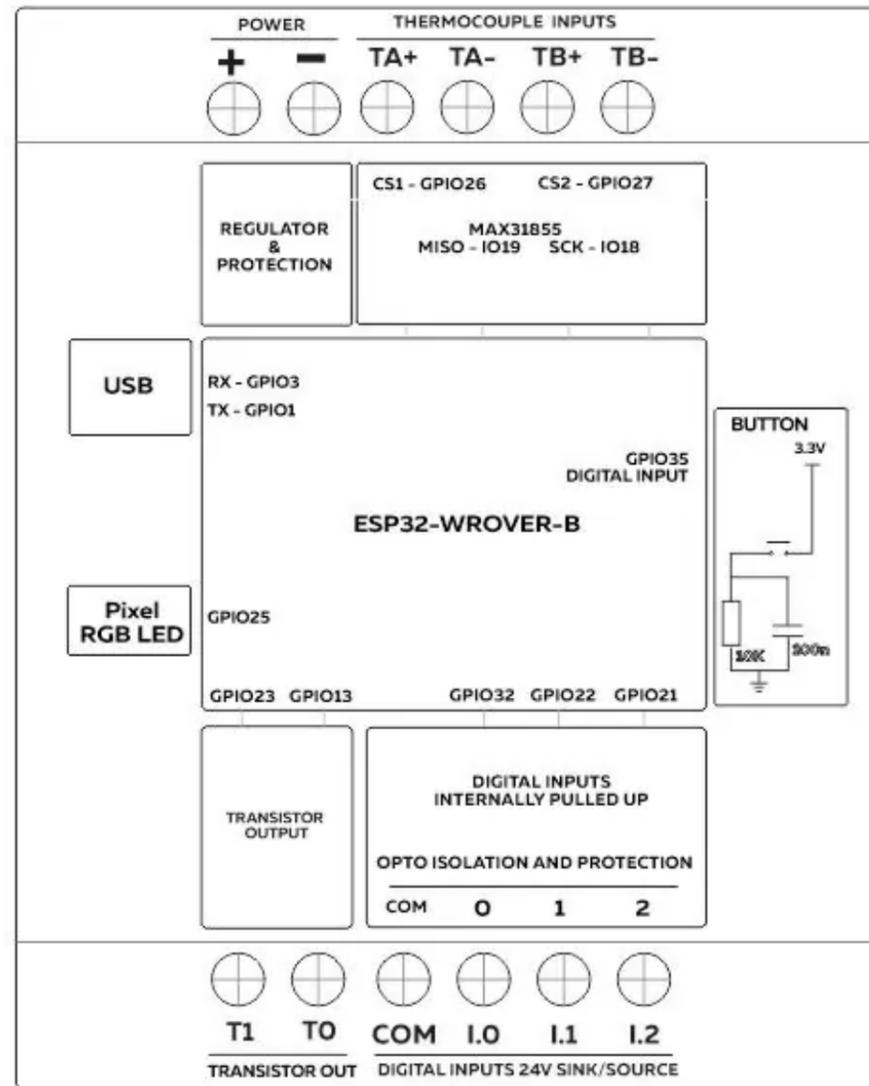




NORVI AGENT 1-BT03 – DATASHEET

Product Features



- ESP32-WROVER-B Module
- Built-in Button on front panel
- Digital Inputs
- Thermocouple Input
- Transistor Outputs
- DIN-Rail mount

Main

Range of Product	NORVI AGENT 1
Product type	Programmable Node
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	Standard 12 – 24V DC / Low Power : 3.3 – 6V DC
Communication	WiFi / Bluetooth
Inputs and Outputs	3 x Digital Inputs 2 x Thermocouple Inputs 2 x Transistor Outputs
Displays and Visual Indicators	4 X LED / Digital Inputs

Complementary

Product Unified Code	NORVI AGENT 1-BT03-ES-SI
Product Part Numbers	NORVI AGENT 1-BT03-ES-SI

Mechanical Properties

Enclosure	NORVI 202
Mounting / Installation Method	DIN RAIL / MOUNTING TABS
Terminal Type	SCREW TERMINAL
Terminal Arrangement	Top and Bottom
Length	59.00 mm
Height	86.00 mm
Width	35.00 mm

Environment

IP degree of protection	IP20
Operating altitude	0 – 2000 meters
Operating Temperature	– –10 ... +85° C (14...185 °F)
Storage altitude	0 – 3000 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)	24V DC
Current Consumption (mA)	400mA
Recommended Power Source	1A 24V DC

Processing

SOC / MCU	ESP32-WROVER-B
Flash Memory	4 MB
ROM	448 KB
SRAM	520 KB
PSRAM	8 MB

Peripherals

Built-in Buttons

Button 1 Pin	Digital Input GPIO35
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Indicators

Module Type	WS2812
Communication	One wire
Connection	GPIO25

INPUTS and OUTPUTS

Digital Inputs

Number of Digital Inputs	3
Digital Input Polarity	Sink and Source
Digital Input Maximum Voltage	32V DC
Digital Input Minimum Voltage	18V DC
Maximum Switching Frequency	1 kHz
Terminal Arrangement	Digital Input 0 – GPIO32 Digital Input 1 – GPIO22 Digital Input 2 – GPIO21

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
Terminal Arrangement	T.1 – GPI023 T.0 – GPI013

Thermocouple Inputs

Thermocouple Type	MAX31855
Resolution	14-Bit, 0.25° C
Versions Available	K, J, N, T, or E type
Supply Voltage Range	-0.3V to +4.0V
Junction Temperature	150° C
Continuous Power Dissipation	470.6mW
SPI MISO	GPIO19
SPI SCK	GPIO18
CS1 / Thermocouple TA	GPIO26
CS2 / Thermocouple TB	GPIO27
Terminal Arrangement	

Thermocouple Wire Connections and Nominal Sensitivities

TYPE	T- WIRE	T+ WIRE	TEMP RANGE (°C)	SENSITIVITY	COLD-JUNCTION SENSITIVITY
K	Alumel	Chromel	-200 to +1350	41.276 (0° C to +1000° C)	40.73
J	Constantan	Iron	-40 to +750	57.953 (0° C to +750° C)	52.136
N	Nisil	Nicrosil	-200 to +1300	36.256 (0° C to +1000° C)	27.171
S	Platinum/Rhodium	Platinum	+50 to +1600	9.587 (0° C to +1000° C)	6.181
T	Constantan	Copper	-250 to +400	52.18 (0° C to +400° C)	41.56
E	Constantan	Chromel	-40 to +900	76.373 (0° C to +1000° C)	44.123
R	Platinum/Rhodium	Platinum	-50 to +1770	10.506 (0° C to +1000° C)	6.158

GPIO Map

GPIO	Description	Usage
0	outputs PWM signal at boot	NRST
1	USB to Serial	TX0
2		
3	USB to Serial	RX0
4	input only	
5	input only	
12		
13	Output only	Transistor Output 0
14	outputs PWM signal at boot	
15	outputs PWM signal at boot	
16		
17		
18	Thermocouple Input	SPI SCK
19	Thermocouple Input	SPI MISO
21	input only	Digital Input 2
22	input only	Digital Input 1
23	Output only	Transistor Output 1
24		
25	Indicators	Pixel RGB LED
26	Thermocouple Input: TA Chip Select	CS1
27	Thermocouple Input: TB Chip Select	CS2
32	input only	Digital Input 0
33		
34		
35		Button
36		
37		
38		
39		

NORVI AGENT 1-BT03 – GUIA DEL USUARIO

Programación

El NORVI AGENT 1-BT03-ES-SI tiene un puerto mini USB para la conexión en serie con el SoC para la programación. Se puede utilizar cualquier IDE de programación compatible con ESP32 para programar el controlador. Siga esta Guía para programar controladores NORVI basados en ESP32 con el IDE Arduino.

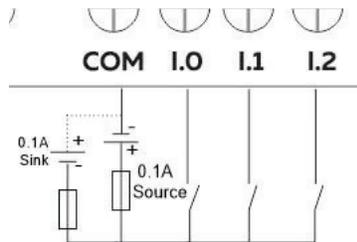
SoC: ESP32-WROVER-B

Puerto de Programación: USB UART

Entradas Digitales

Cableado de Entradas Digitales

Las entradas digitales del NORVI AGENT 1-BT03-ES-SI pueden configurarse como conexiones de fuente y de sumidero. La polaridad inversa de la entrada digital debe suministrarse al terminal común.



NORVI AGENT 1-BT03-ES-SI Cableado de entrada digital

Programación de Entradas Digitales

La lectura del GPIO correspondiente del ESP32 da el valor de la Entrada Digital. Cuando las entradas están en estado OFF, el GPIO pasa a HIGH, y cuando la entrada está en estado ON, el GPIO pasa a LOW. Consulte la tabla de asignación de GPIO en la hoja de datos para el GPIO de entrada digital.

```
#define INPUT1 32

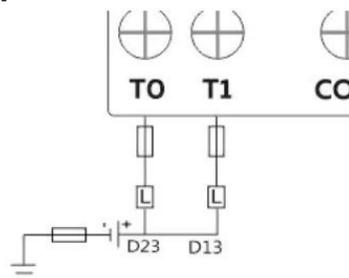
void setup() {
  Serial.begin(115200);
  Serial.println("Device Starting");

  pinMode(INPUT1, INPUT);
}

void loop() {
  Serial.print(digitalRead(INPUT1));
  Serial.println("");
  delay(500);
}
```

Salidas Transistor

Cableado de Salidas Transistor



NORVI AGENT 1-BT03-ES-SI Cableado de salida de transistor

Programación de Salidas de Transistor

La lectura del GPIO correspondiente del ESP32 proporciona el valor de la salida del transistor. Consulte la tabla de asignación de GPIO en la hoja de datos para el GPIO de salida del transistor.

```
#define OUTPUT1 23

void setup() {
  Serial.begin(115200);
  Serial.println("Device Starting");
  pinMode(OUTPUT1 , OUTPUT);
}

void loop() {
  digitalWrite(OUTPUT1, HIGH);
  delay(500);
  digitalWrite(OUTPUT1, LOW);
  delay(500);
  Serial.println("");
  delay(500);
}
```

Entrada de Termocupla

SPI MISO	GPIO19
SPI SCK	GPIO18
CS1 / Thermocouple TA	GPIO26
CS2 / Thermocouple TB	GPIO27

Programación de Entradas de Termocuplas

```
#include <SPI.h>
#include "Adafruit_MAX31855.h"
// Example creating a thermocouple instance with software SPI on any three
// digital IO pins.
#define MAXDO 19
#define MAXCS_1 26
#define MAXCS_2 27
#define MAXCLK 18

// Initialize the Thermocouple
Adafruit_MAX31855 thermocouple_1(MAXCLK, MAXCS_1, MAXDO);
Adafruit_MAX31855 thermocouple_2(MAXCLK, MAXCS_2, MAXDO);

void setup() {
  Serial.begin(115200);
  Serial.println("MAX31855 test");
  // Wait for MAX chips to stabilize
  delay(500);

  Serial.print("Initializing sensor 1...");
  if (!thermocouple_1.begin()) {
    Serial.println("ERROR.");
    while (1) delay(10);
  }

  Serial.print("Initializing sensor 2...");
  if (!thermocouple_2.begin()) {
```

```

    Serial.println("ERROR.");
    while (1) delay(10);
}

// OPTIONAL: Can configure fault checks as desired (default is ALL)
// Multiple checks can be logically OR'd together.
// thermocouple.setFaultChecks(MAX31855_FAULT_OPEN | MAX31855_FAULT_SHORT_VCC);
// Short to GND fault is ignored
Serial.println("DONE.");
}

void loop() {
    double c1 = thermocouple_1.readCelsius();
    double c2 = thermocouple_2.readCelsius();
    if (isnan(c1)) {
        Serial.println("Thermocouple 1 fault(s) detected!");
        uint8_t e = thermocouple_1.readError();
        if (e & MAX31855_FAULT_OPEN) Serial.println("FAULT: Thermocouple is open - no connections.");
    }
    else {
        Serial.print("C1 = ");
        Serial.println(c1);
    }

    if (isnan(c2)) {
        Serial.println("Thermocouple 2 fault(s) detected!");
        uint8_t e = thermocouple_2.readError();
        if (e & MAX31855_FAULT_OPEN) Serial.println("FAULT: Thermocouple is open - no connections.");
    }
    else {
        Serial.print("C2 = ");
        Serial.println(c2);
    }
    delay(200);
    Serial.println("");
}

```

Botones Integrados

Botón 1 Pin	Entrada Digital GPIO35
-------------	------------------------

GPIO Conexión de botones

Programación de Botones

```

#include <Adafruit_NeoPixel.h>
#define BUTTON_PIN 35 //Digital IO pin connected to the button. This will be
#define PIXEL_PIN 25 // Digital IO pin connected to the NeoPixels.
#define PIXEL_COUNT 1
Adafruit_NeoPixel strip = Adafruit_NeoPixel(PIXEL_COUNT, PIXEL_PIN, NEO_GRB + NEO_KHZ800);
bool oldState = HIGH;
int showType = 0;

void setup() {

```

```

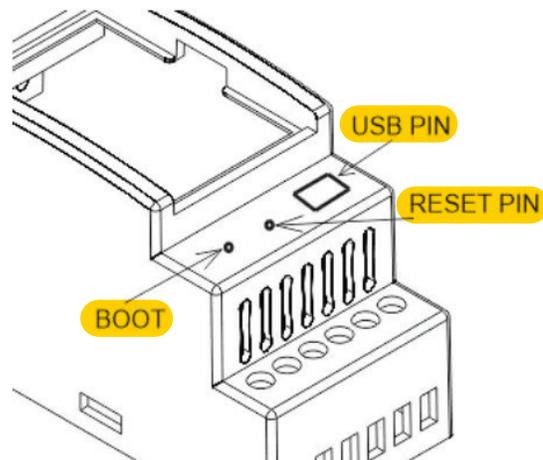
Serial.begin(115200);
pinMode(BUTTON_PIN, INPUT_PULLUP);
strip.begin();
strip.show(); // Initialize all pixels to 'off'
Serial.println("RS-485 TEST");
}

void loop() {
  bool newState = digitalRead(BUTTON_PIN);
  if (newState == LOW && oldState == HIGH) {
    delay(20);
    newState = digitalRead(BUTTON_PIN);
    if (newState == LOW) {
      showType++;
      if (showType > 9)
        showType = 0;
      startShow(showType);
    }
  }
  oldState = newState;
}

void startShow(int i) {
  switch (i) {
    case 0: colorWipe(strip.Color(0, 0, 0), 50); break;
    case 1: colorWipe(strip.Color(255, 0, 0), 50); break;
    case 2: colorWipe(strip.Color(0, 255, 0), 50); break;
    case 3: colorWipe(strip.Color(0, 0, 255), 50); break;
    case 4: theaterChase(strip.Color(127, 127, 127), 50); break;
    case 5: theaterChase(strip.Color(127, 0, 0), 50); break;
    case 6: theaterChase(strip.Color(0, 0, 127), 50); break;
    case 7: rainbow(20); break;
    case 8: rainbowCycle(20); break;
    case 9: theaterChaseRainbow(50); break;
  }
}

```

USB y Reinicio



USB, BOOT and Reset