

Jordi Binefa www.binefa.com

- Project repository
- Electronic schematic
- Key components
- Arduino IDE settings
- Firmware programming

 Project repository: https://github.com/jordibinefa/IoT-02

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README.md	Initial commit		2 years ago

• Schematic



- CPU (ESP32)
- LDR
- Buttons
- Latching Relay



• CPU (ESP32)





Latching Relay

HFD2

c RU us

File No.:E133481





Features

- High sensitive: 150mW
- Matching standard16 pin IC socket
- High switching capacity 60W/125VA
- Bifurcated contacts
- Epoxy sealed for automatic wave soldering and cleaning
- Single side stable and latching type available
- Environmental friendly product available (RoHS compliant)
- Outline Dimensions: 20.2 x 10.0 x 10.6 mm

CONTACT DATA

Contact arrangement	2C
Initial contact resistance	50mΩ
Contact material	see ordering info.
Contact rating (Res. load)	2A 30VDC 1A 125VAC
Max. switching power	60W / 125VA
Max. switching voltage	220VDC / 250VAC
Max. switching current	2A
Min. applicable load	10mV 10μA
Electrical life	1 x 10⁵ops (at 2A 30VDC) 5 x 10⁵ ops (at 1A 30VDC)
Mechanical life	1 x 10 ⁸ OPS

CHARACTERISTICS

Initial insulati	on resistance	1000MΩ (at 500VDC)	
Dielectric	Contacts to coil	1coil: 1500VAC 1min.	
		2coil: 1000VAC 1min.	
Suengui	Contacts to contact	1000VAC 1min.	
Operate time (at nomi. volt.)		Max. 4ms	
Release time (at nomi. volt.)		Max. 3ms	
Set time (latching)		3ms	
Reset time (latching)		3ms	
Bounce time		1.5ms	
Ambient tem	perature	-40 °C to +85 °C	
Humidity		5 to 85% RH	
Vibration resistance		10 to 55Hz 196m/s2 (20g)	
Shock	Functional	490m/s ² (50g)	
resistance	Destructive	980m/s² (100g)	
	Contact to contact	2.0pF	
Capacitance	Contact set to contact	1.5pF	
	Contact to coil	5.0pF	
Termination		PCB (DIP)	
Unit weight		4.5g	
Construction		Sealed IP67	

ModBus







ProSoft Technology video explaining ModBus RTU and ModBus TCP



• LoRa Module (SPI)





SPI bus explanation

• I2C (BME280)



• I2C (OLED 0.96")



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I2C bus explanation

Made with KiCAD



Programmable with

• Arduino IDE

Platform IO

		IoT-02_11_modbus_bme280 Arduino 1.8.15	×	
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File Edit

https://www.arduino.cc/

Installing ESP32 Add-on in Arduino IDE

 In your Arduino IDE, go to File / Preferences. Enter the following into the Additional Board Manager URLs :

https://dl.espressif.com/dl/package_esp32_index.json

- Open the Boards Manager. Go to Tools / Board: "..." / Boards Manager ... Search for ESP32 and press install button for the ESP32 by Espressif Systems. Approximately 300MB are automatically downloaded.
- Once it is installed, close the board installation popup. Select *Tools / Board: "..." / ESP32 Dev Module*. Select the Port at *Tools / Port / /dev/ttyUSB0* (in Windows the port is *COMx*)

Arduino IDE libraries (493MB)

• These libraries are for compiling code examples

Download all GitHub codes and Arduino IDE libraries on your computer. Libraries must be placed in the *libraries* directory inside *Arduino* folder (*/home/user* in GNU / Linux and *My Documents* in Windows)

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http://rebost.binefa.cat/iot/arduino/

Sequence to select programming mode on IoT-02 board:

- Press the red button (**RST**)
- Press the IOO white button
- Stop pressing the red button (**RST**)
- Stop pressing the *IO0* white button

Uploading example firmware

From Arduino IDE, open IoT-02_07_SSD1306_BME280.ino file, previously downloaded with other example codes.

Set IoT-02 board in programming mode, connect the red board, and upload the firmware by pressing the round button with right pointing arrow (



Physical connection with other devices



Practical Demonstration

