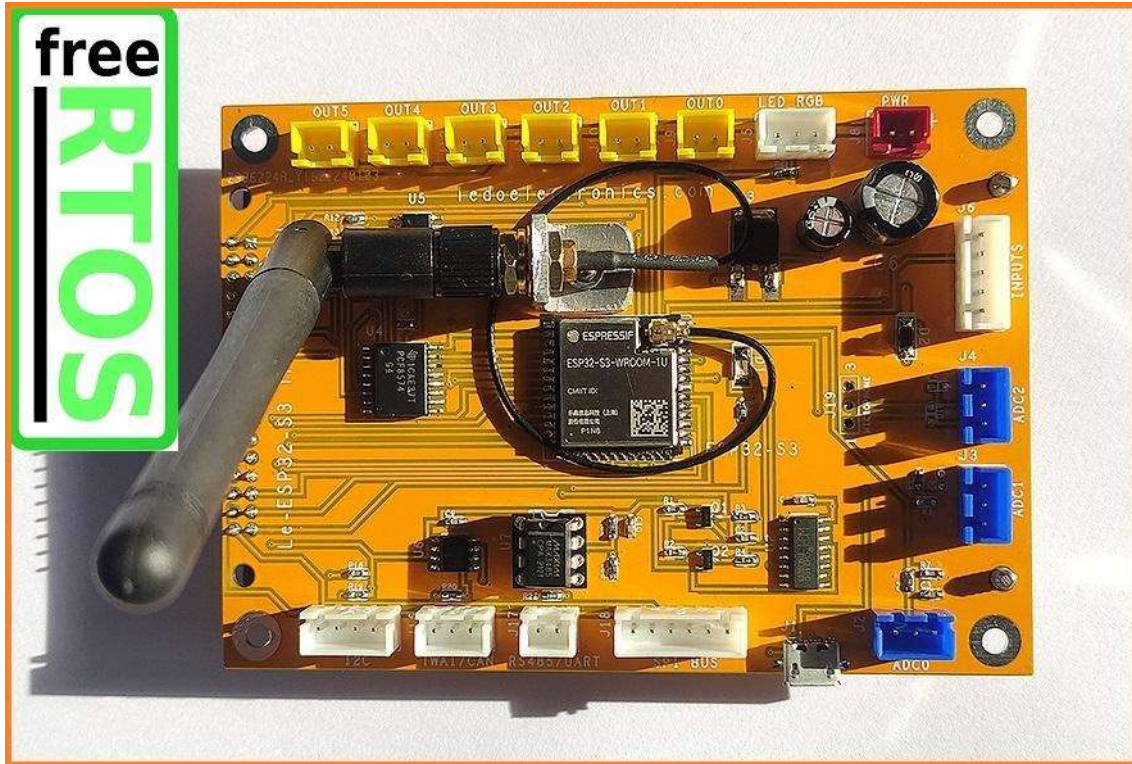
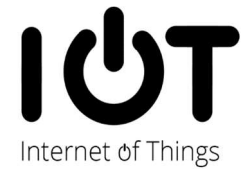


IoT Module

Le-ESP32-S3-TFT4.0



- For IoT application development, simple WEB server, TCP/IP station
- Bluetooth
- Powerful and compact control system based on Espressif's ESP32-S3 dual-core 32-bit microcontroller
- 240 MHz 32 bits CPU, 512 KB RAM, 4 MB / 8MB Flash
- Digital and analog inputs and outputs
- Touch screen TFT 4.0" color 480 x 800 pixels. NE35510 and AD7843 controllers
- WIFI, Bluetooth, USB, I2C, SPI, CAN Bus and RS485 / UART communications
- Connectors for rotary encoder or three push buttons
- PC programming via USB port
- Compatible with Espressif IDE, Arduino, PlatformIo, etc.
- Compatible with Google and Amazon IoT platforms, among others
- Power supply voltage: 6V...12V DC / 100 mA

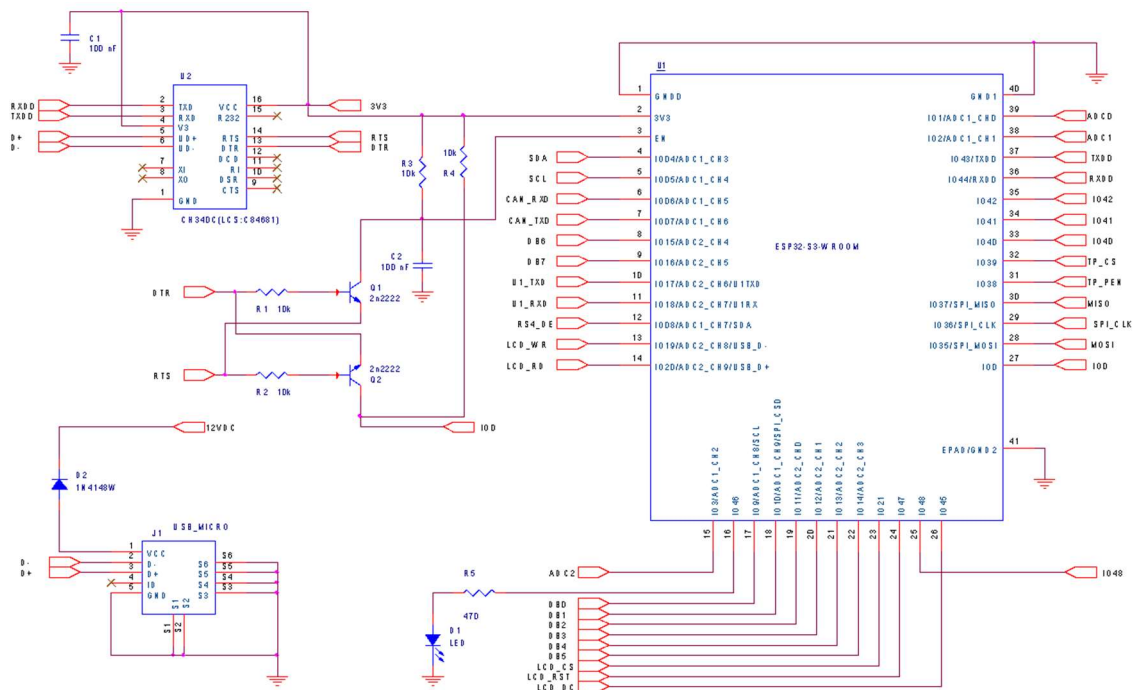


Fig.2. CPU and USB programming circuit.

The IC U2 and the transistors Q1 and Q2, allow the automatic programming of the ESP32-S3 microcontroller, from the IDE of Espressif, Arduino and PlatformIO, so that to load the project it is only necessary to power the module, and connect it to the PC via a USB cable. In these development environments, one of the ESP32-S3- WROOM, NODEMCU-32-S3, etc boards must be chosen.

ESP32-S3 resource usage table

PIN ESP32-S3	USAGE	CONNECTOR
IO04	I2C SDA	J15-1
IO05	I2C SCL	J15-2
3V3	POWER	J15-3
GND	GND	J15-4
IO46	SYSTEM LED	
IO06	CAN RX (SN65HVD232)	J16-1 (CAN H)
IO07	CAN TX (SN65HVD232)	J16-2 (CAN L)
GND	GND	J16-3
IO18	UART RX / RS485	J17-1 (RS485 A)
IO17	UART TX / RS485	J17-2 (RS485 B)
IO08	RS485 DE	
IO21	LCD CS	J7-1
IO45	LCD DC	J7-2
IO19	LCD WR	J7-3
IO20	LCD RD	J7-4
IO47	LCD RST	J7-5
IO09	LCD DB0	J7-6
IO10	LCD DB1	J7-7
IO11	LCD DB2	J7-8
IO12	LCD DB3	J7-9
IO13	LCD DB4	J7-10
IO14	LCD DB5	J7-11
IO15	LCD DB6	J7-12
IO16	LCD DB7	J7-13
	LCD BKL	J7-23
	3V3	J7-24
	3V3	J7-25
	GND	J7-26
	GND	J7-27
	NC	J7-28
IO37	TP DO	J7-29
IO35	TP DI	J7-30
IO38	TP PEN	J7-31
GND	NC	J7-32
IO39	TP CS	J7-33
IO36	TP CLK	J7-34
3V3	ENCODER PWR	J6-1
IO40	ENCODER A	J6-2
IO41	ENCODER B	J6-3
IO42	ENCODER PUSH	J6-4
GND	ENCODER GND	J6-5
IO01 (ADC0)	ENTRADA ANALOGICA	J2-1
GND	GND	J2-2
IO02 (ADC1)	ENTRADA ANALOGICA	J3-1
GND	GND	J3-2

IO03 (ADC2)	ENTRADA ANALOGICA	J4-1
GND	GND	J4-2
PIN ESP32-S3	USAGE	CONNECTOR
	+12V DC	J5-1
IO48	RGB LED	J5-2
	GND	J5-3
	SPI MISO	J18-1
	SPI MOSI	J18-2
	SPI CLK	J18-3
	SPI CS	J18-4
	3V3	J18-5
	GND	J18-6

Use of the PCF8574 expander

PCF8574 IO	USAGE	CONNECTOR
	12V DC	J9-1
P0	SALIDA RELE	J9-2
	12V DC	J10-1
P1	SALIDA RELE	J10-2
	12V DC	J11-1
P2	SALIDA RELE	J11-2
	12V DC	J12-1
P3	SALIDA RELE	J12-2
	12V DC	J13-1
P4	SALIDA RELE	J13-2
	12V DC	J14-1
P5	SALIDA RELE	J14-2

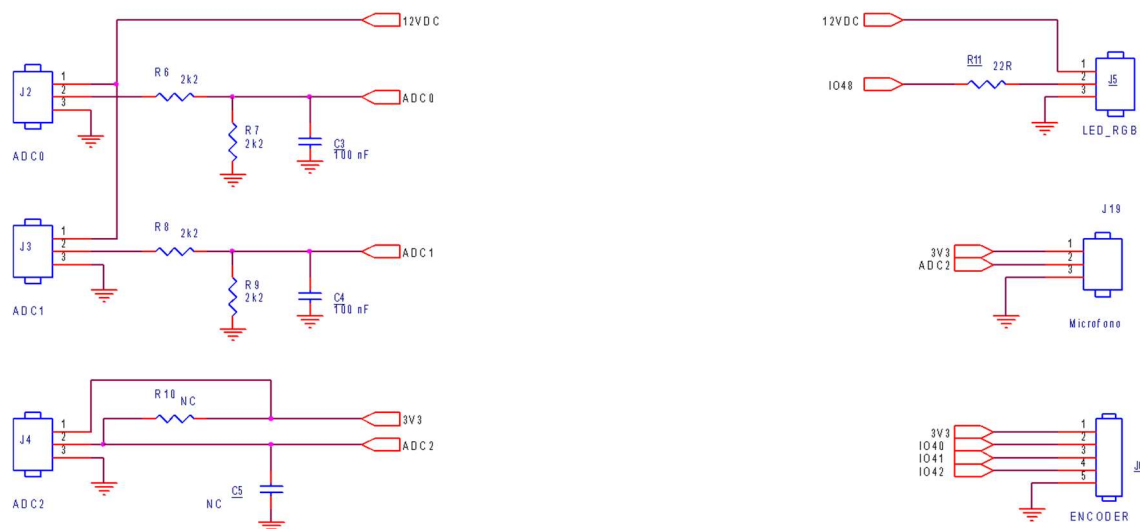


Fig.3. Analog and digital inputs.

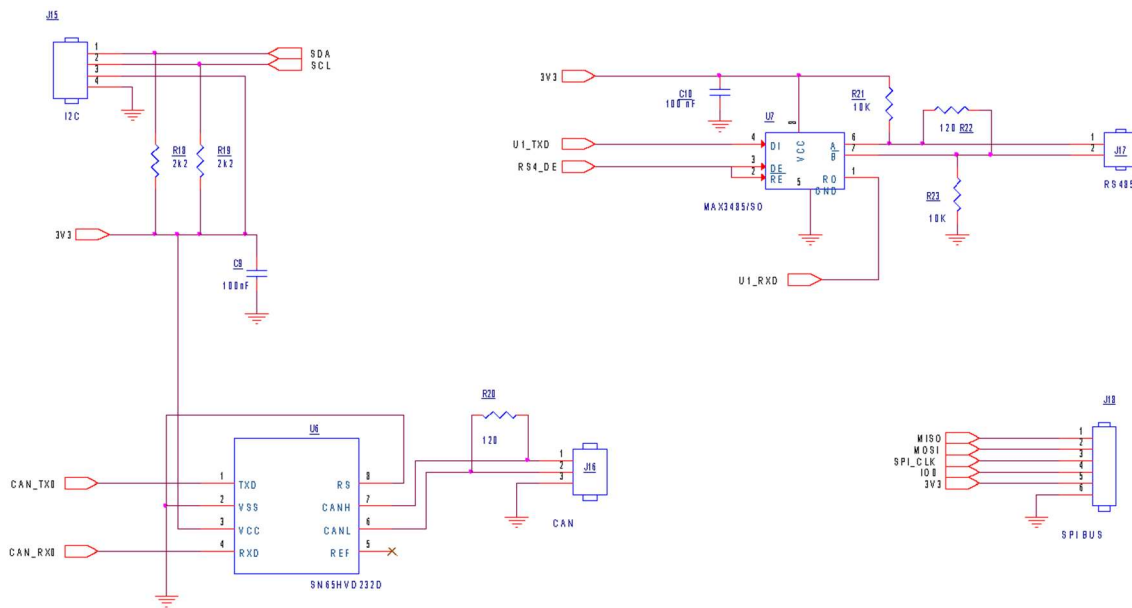


Fig.4. I2C, SPI, CAN Bus and RS485.

The RS485 conversion chip (U7) is mounted in a socket, so that it can be removed if we want to use the interface in UART mode. In this case, we need to connect jumpers between pins 4 and 6 and pins 1 and 7 of the DIP8 socket.

The computing power of the 32-bit microcontroller, the presence of analog and digital inputs and outputs, its large number of communication buses, and the color graphic touch screen make this board an attractive option for the design of control systems and various IoT applications.

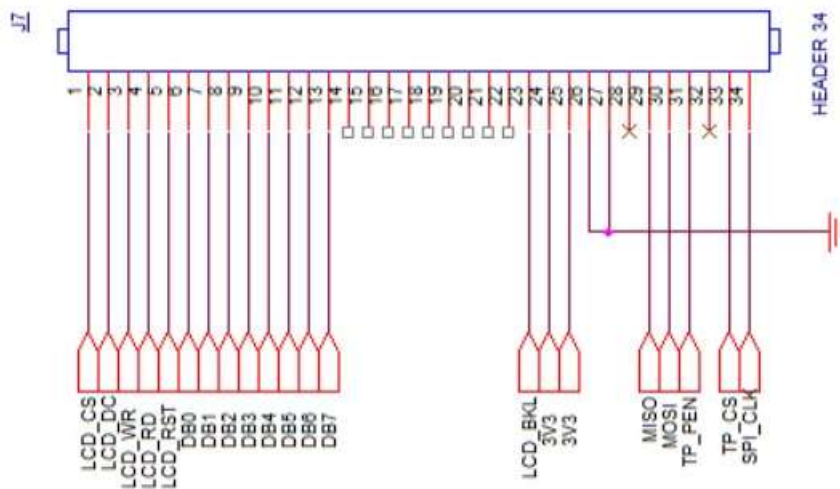
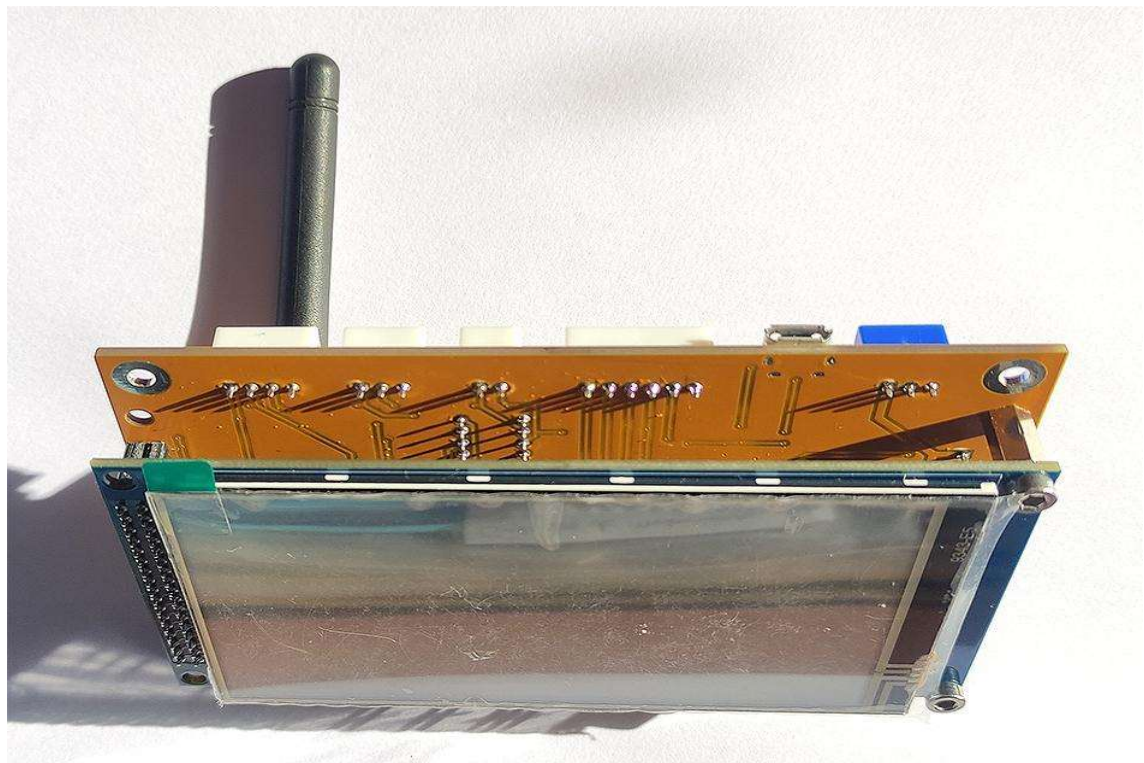
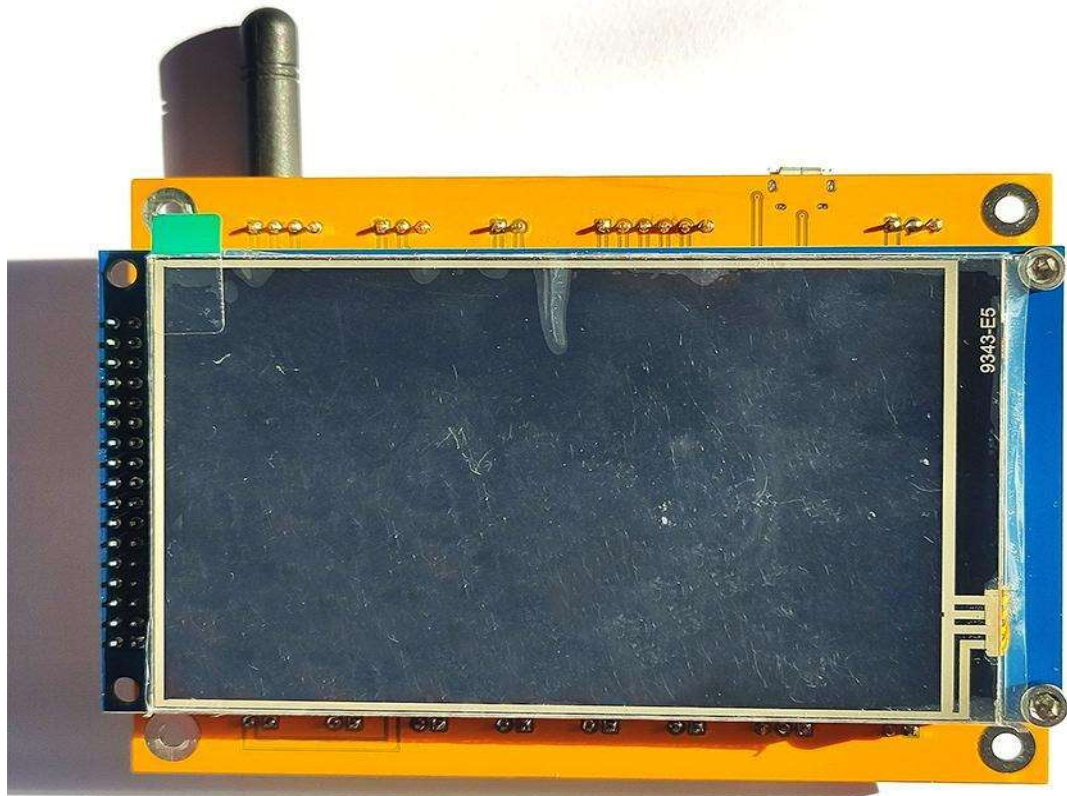


Fig.5. TFT Touch Connector.





Conclusions:

Unlike other IoT modules on the market, this one is characterized by being compact and versatile, oriented to be used also in real process control equipment, it has everything necessary to adapt to a very diverse range of applications, without the need to add other modules.