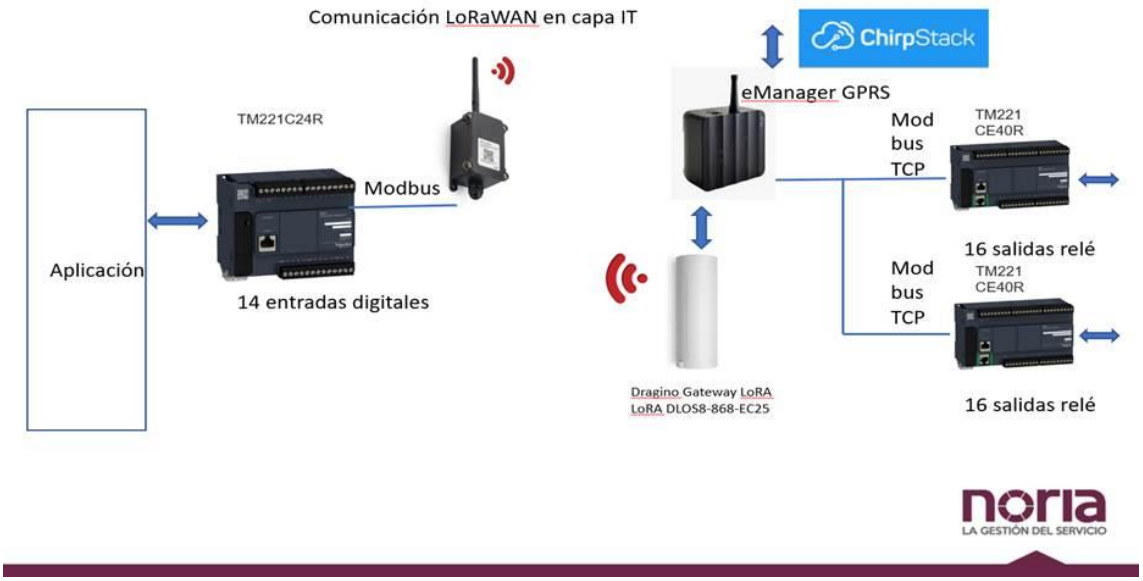
LORAWAN PLC NETWORK

PLC M221 as LoRaWAN Node



Let’s apply a Modbus to LoRaWAN converter like RS485-BL or RS485-LN

Using a RJ45 patchcord with free wires for the serial Modbus RTU port.

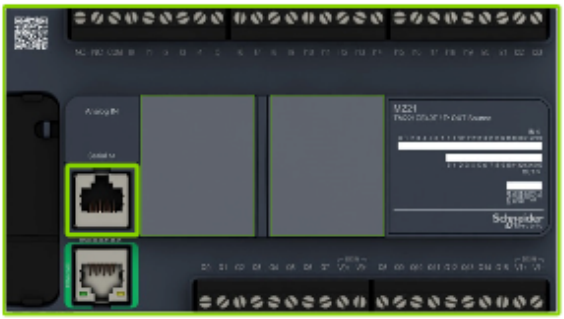
Blue A+

White B-

Configuring PLC Modbus settings

Propiedades | Configuración | Programa

- Mensajes
- MyController (TM221CE40T)
  - Entradas digitales
  - Salidas digitales
  - Entradas analógicas
  - Contadores muy rápidos
  - Generadores de pulsos
  - Bus de E/S
  - ETH1
    - Modbus TCP
    - Adaptador Ethernet/IP
  - SL1 (línea serie)
    - Modbus



Configuración de línea serie

Ajustes de protocolo

Protocolo: Modbus

Configuración de línea serie

Velocidad de transmisión: 19200

Paridad: Ninguna

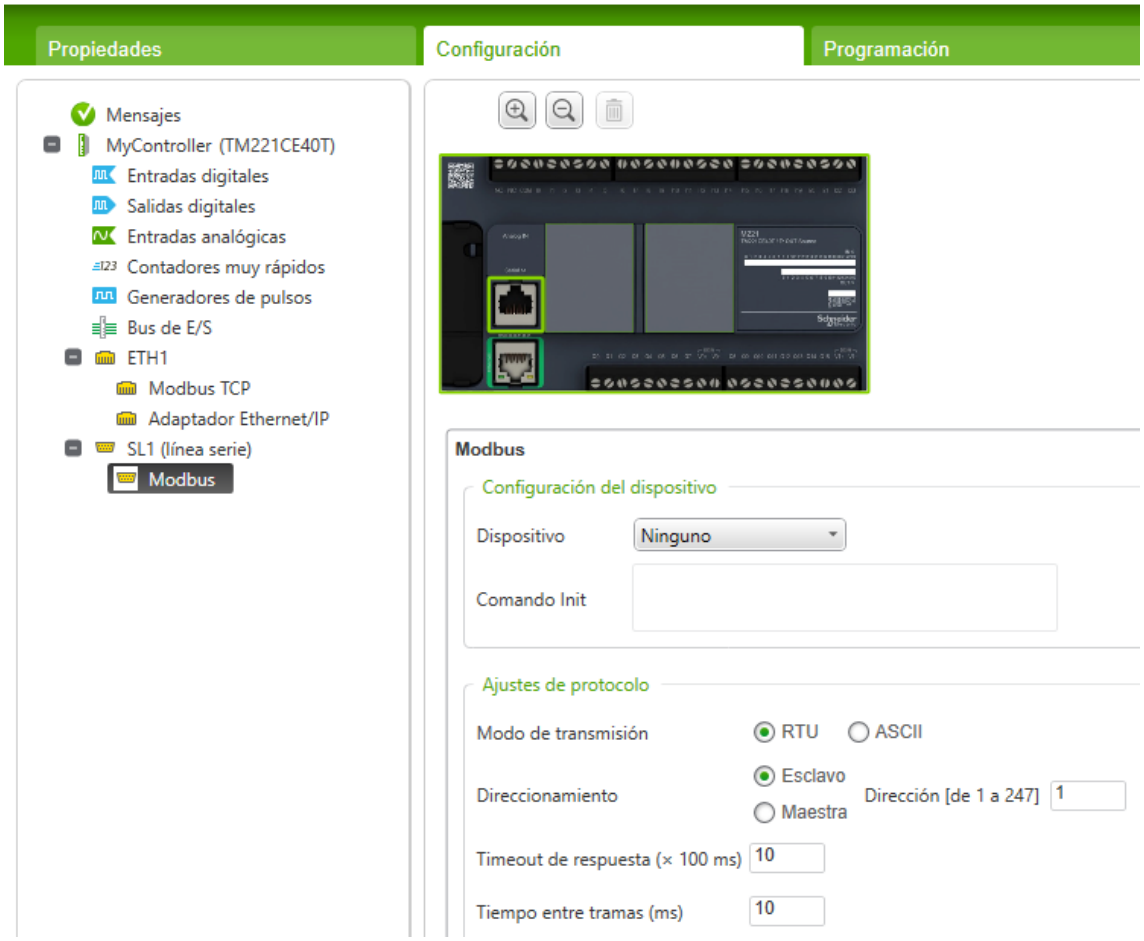
Bits de datos: 8

Bits de parada: 1

Medio físico

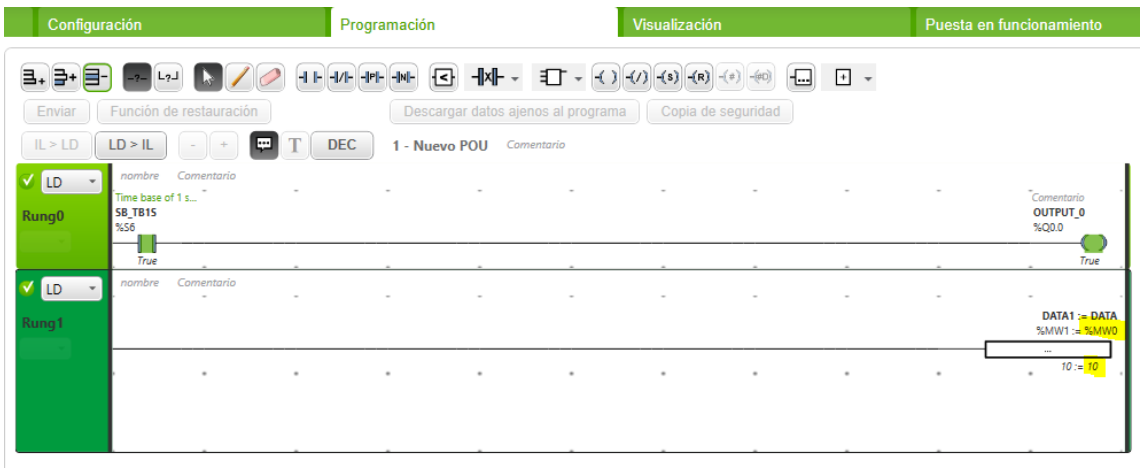
- (•) RS-485
- ( ) RS-232

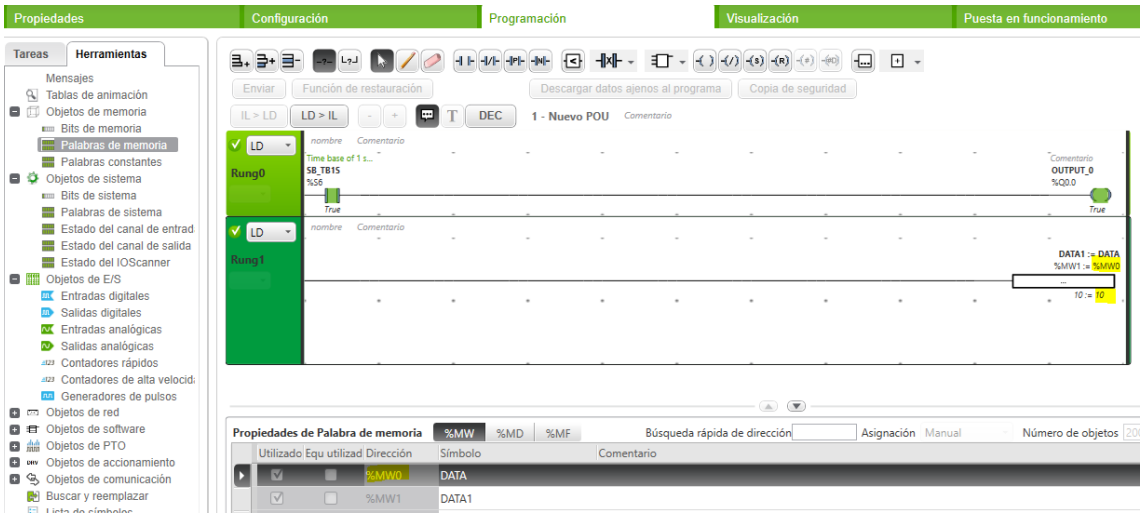
Polarización: No



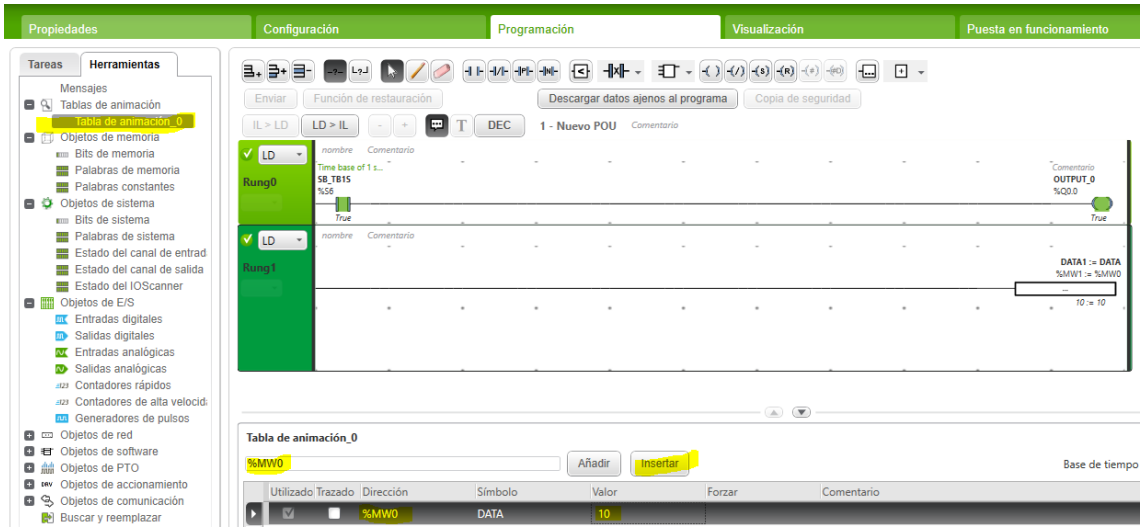
Reading %MW0 with M221

Let's have some value in %MW0



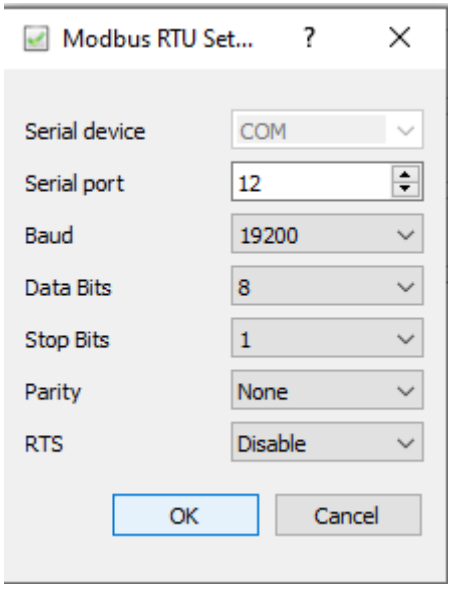


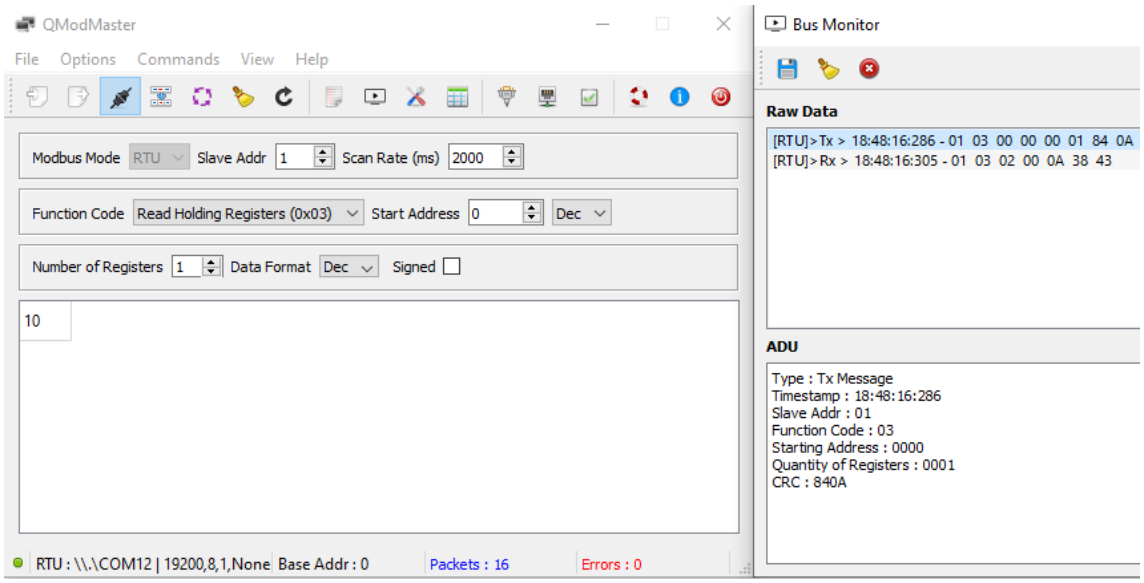
For example inserting the value of %MW0 with animation tables

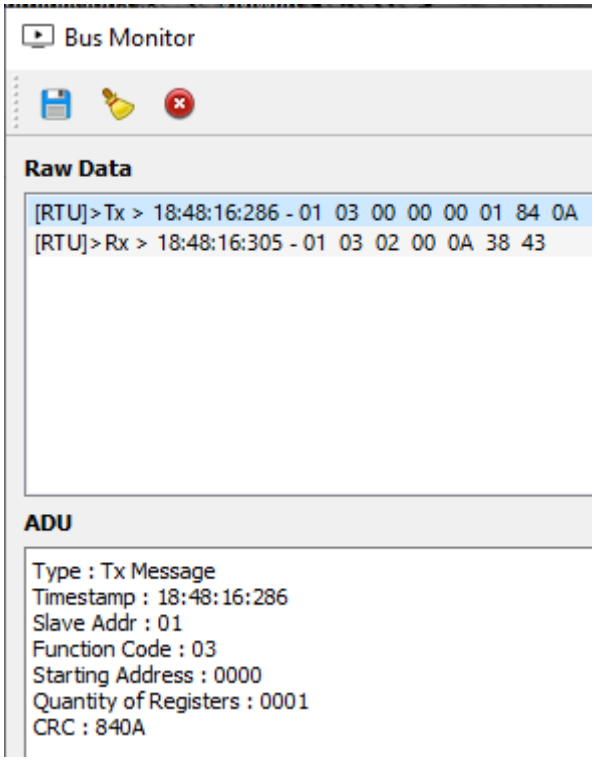


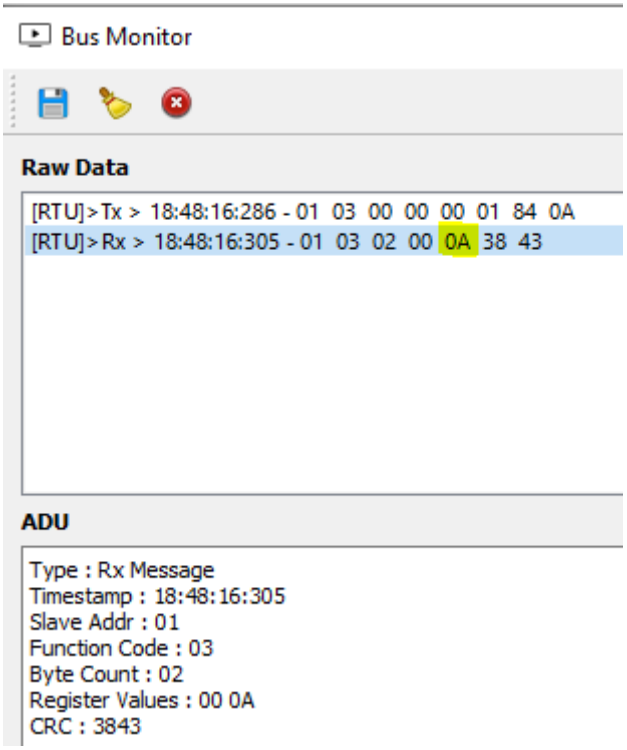
Let’s read with Qmod Master

With this settings




QModMaster
File Options Commands View Help
Modbus Mode RTU Slave Addr 1 Scan Rate (ms) 2000
Function Code Read Holding Registers (0x03) Start Address 0 Dec
Number of Registers 1 Data Format Dec Signed
10
RTU : \\.\COM12 | 19200,8,1,None Base Addr : 0
Packets : 16
Errors : 0
Bus Monitor
Raw Data
[RTU]>Tx > 18:48:16:286 - 01 03 00 00 00 01 84 0A
[RTU]>Rx > 18:48:16:305 - 01 03 02 00 0A 38 43
ADU
Type : Tx Message
Timestamp : 18:48:16:286
Slave Addr : 01
Function Code : 03
Starting Address : 0000
Quantity of Registers : 0001
CRC : 840A


Bus Monitor
Raw Data
[RTU]>Tx > 18:48:16:286 - 01 03 00 00 00 01 84 0A
[RTU]>Rx > 18:48:16:305 - 01 03 02 00 0A 38 43
ADU
Type : Tx Message
Timestamp : 18:48:16:286
Slave Addr : 01
Function Code : 03
Starting Address : 0000
Quantity of Registers : 0001
CRC : 840A



So the right values for the Dragino RS485-BL will be:

AT+COMMAND1=01 03 00 00 00 01,1

AT+DATACUT1=7,1,4+5

Let's setup the Dragino on TTS

DevEui= A8 40 41 95 C1 82 C9 43

AT+DEUI=?

AT+APPKEY=?

AT+APPEUI=?

1. Select the end device

Brand * | Model * | Hardware Ver. * | Firmware Ver. * | Profile (Region) *

Dragino Technology Co.,... | RS485-BL | Unknown ... | 1.0 | EU_863_870

RS485-BL

MAC V1.0.3, PHY V1.0.3 REV A, Over the air activation (OTAA), Class A

LoRaWAN RS485/UART Converter -- WaterProof Battery Powered

Product website

2. Enter registration data

Frequency plan *

Europe 863-870 MHz (SF9 for RX2 - recommended)

AppEUI *

`A0 00 00 00 00 00 01 01` `00`

DevEUI *

`A8 40 41 95 C1 82 C9 43`

AppKey *

Let’s change the period of messages

```
AT+TDC=?
600000

OK
```

To 10 seconds

```
AT+TDC=10000

OK
```

rs485-bl

ID: rs485-bl

Last seen 9 seconds ago ↑3 ↓1

Overview | Live data | Messaging | Location | Payload formatters | Claiming | General settings

Time	Type	Data preview			
↑ 20:51:13	Forward uplink data message	MAC payload:	0D 48 01	FPort: 2 SNR: 8.75 RSSI: -29 Bandwidth: 125000	
↑ 20:51:03	Forward uplink data message	MAC payload:	0D 4F 01	FPort: 2 SNR: 11.25 RSSI: -29 Bandwidth: 125000	
↑ 20:50:53	Forward uplink data message	MAC payload:	0D 4A 01	FPort: 2 SNR: 11.75 RSSI: -30 Bandwidth: 125000	
↑ 20:50:45	Forward uplink data message	MAC payload:	0D 54 01	FPort: 2 SNR: 8.25 RSSI: -30 Bandwidth: 125000	

```
AT+BAUDR=?
9600

OK
```

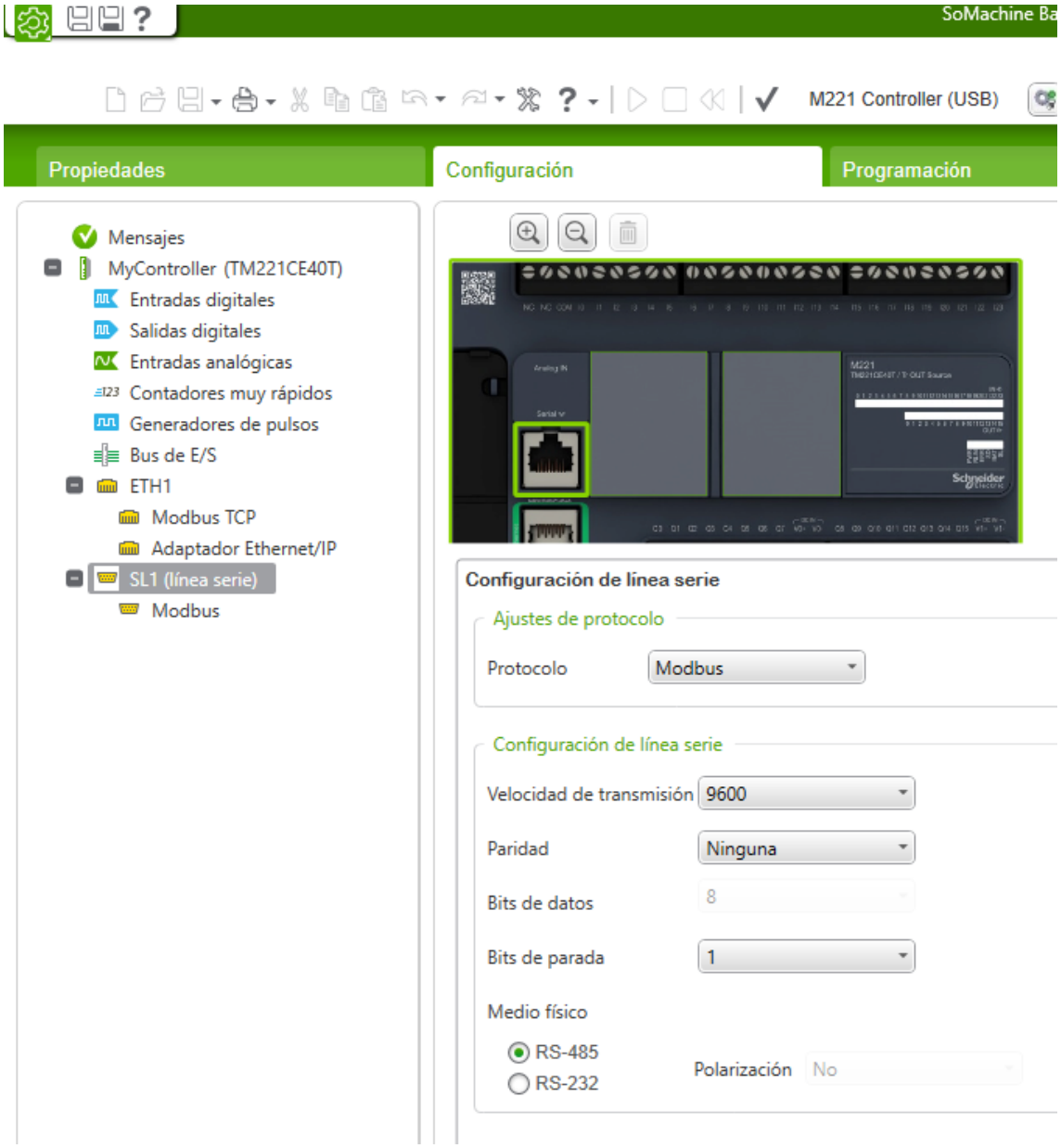
```
AT+PARITY=?
0

OK
```

```
AT+STOPBIT=?
0

OK
```

Let’s change the PLC serial speed to 9600 so it is the default value from Dragino



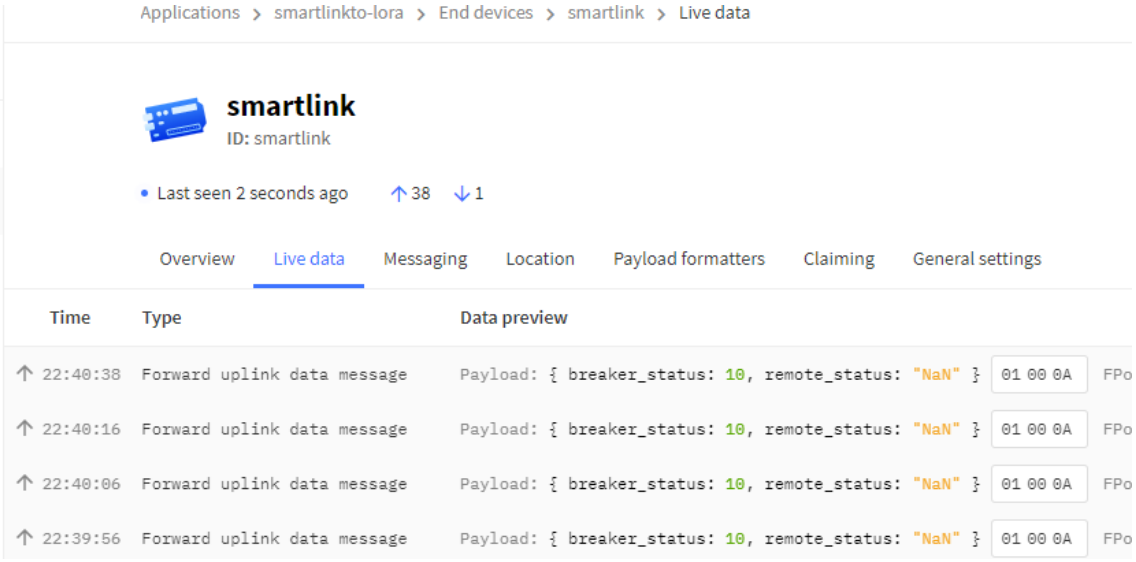
You can find the PLC code here

https://github.com/xavierflorensa/Schneider-M221-as-LoRaWAN-node

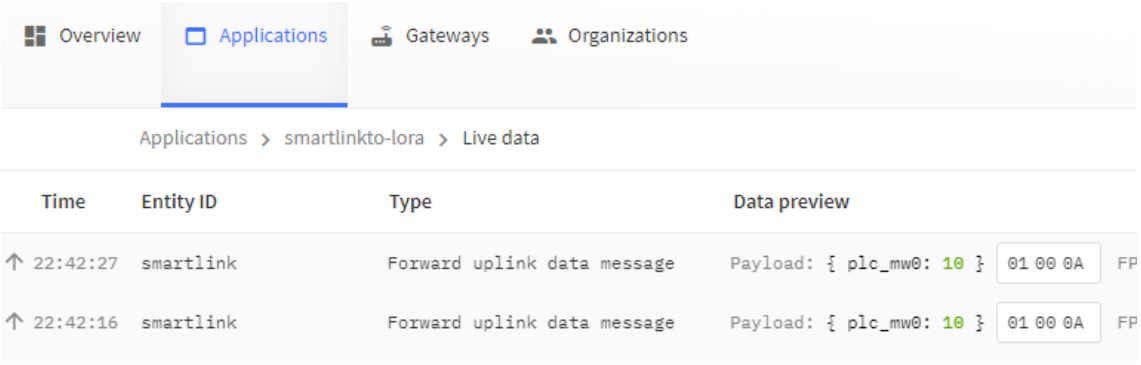
We test now with Dragino RS485-LR

It Works

```
CMD1    = 01 03 00 00 00 01 84 0a
RETURN1  = 01 03 02 00 0a 38 43
Payload  = 01 00 0a
```



Let’s change payload decoder



Now you can get these data thru mqtt by Edge computing on the receiver PLC and inject per Modbus to it.