

Pickdata MIO40 water pulse counter to LoRa with Dragino RS485-LN

Application: Water meter counter and other signals on a farm:

Control por radio LoRa

Elementos de campo

Sensores distancia Silos
LDD575 LoRaWAN Distance Detection Sensor



Contadores de agua



Transductor de presión 4-20mA Genebre




Power Consumption (exclude RS485 device):

- Max 32mA@12v
- 200R Transient 55mA@12v

Power Input 7~ 24V DC.

Dragino RS485-LN Modbus to LoRawan converter

Dragino LT-33222-L LoRa I/O Controller

Elementos de estación base

El cliente provee acceso a internet
En estación base y ordenador PC

Hasta 20 Km en visión directa

Dragino Gateway LoRa LoRA DLOS8-868-EC25



Teltonika Router RUT



Schneider Edge Box



Schneider Machine Advisor



Elementos a ofertar

- Kit Bombeo solar
- Dragino RS485-LN -- RS485 to LoRaWAN Converter
- Dragino LT-33222-L LoRa I/O Controller
- Dragino LDD575 LoRaWAN Distance Detection Sensor
- Dragino Gateway LoRa DLOS8-868-EC25
- Edge Box Schneider
- MIO40 Pickdata
- Router Teltonika RUT240
- Configuración-puesta en marcha



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LA GESTIÓN DEL SERVICIO







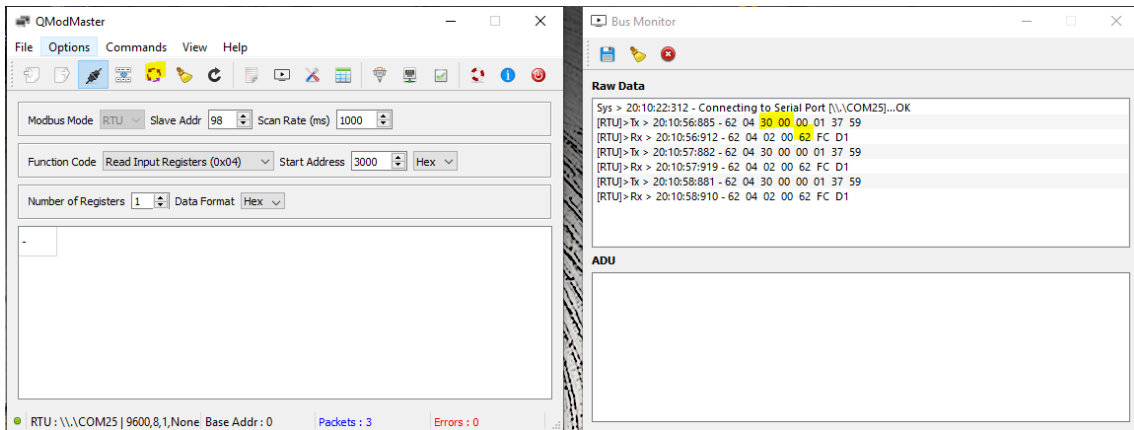
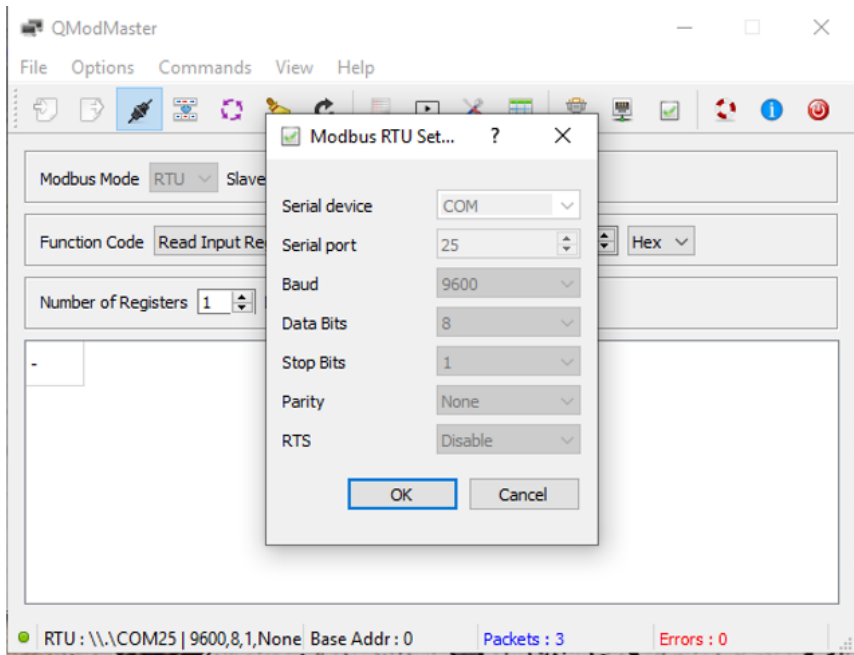
You can connect up to four water meters to one MIO40

On this application the water meters are inside of rear building, and the Gateway is on the roof of main building. Same idea for power meters, etc.



Default MIO40 address is 98

Configure qModMaster to 9600, 8, N, 1 and connect



62 in Hex is address 98 in decimal

Let's read pulse counter channel 1

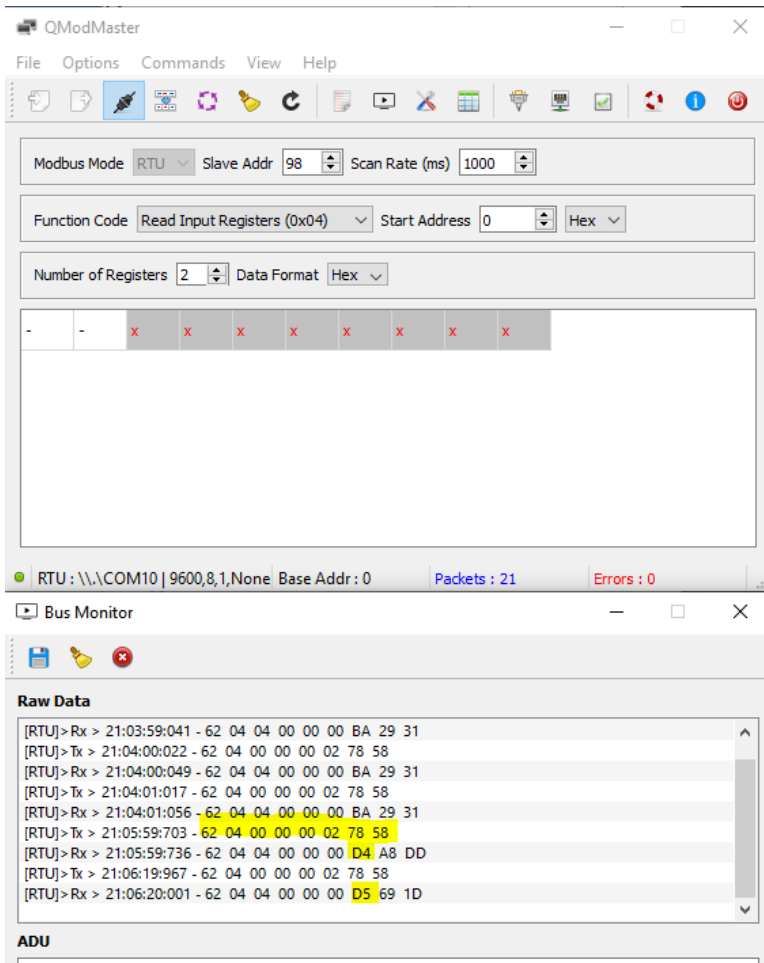
We have to read on register 0

MODBUS RTU COMMANDS

Magnitude	Input Registers	Unit	Function
Peripheral number	0x3000		4,16(0x10)
Baud rate	0x3001	1: 9600 bps 2: 19200 bps	4,16(0x10)
Device version	0x3500-0x3502	Format: "V1.10" values in ASCII and last by always 0	4
Serial number	0x3503-0x3504		4
Meter value 1	0x0000-0x0001		4
Meter value 2	0x0002-0x0003		4
Meter value 3	0x0004-0x0005		4
Meter value 4	0x0006-0x0007		4
Digital input state Activated = Closed (1) Deactivated = Opened (0) Minimum 0 Maximum F	0x2000	0000: deactivated inputs 0001: Input 1 activated 0003: Input 1&2 activated Bin 0001: LSB E1 Bin 1000: MSB E4	4
Digital output control Activated = Closed (1) Deactivated = Opened (0) Minimum 0 Maximum F	0x1000	0000: deactivated outputs 0001: Output 1 activated 0003: Output 1&2 activated Bin 0001: LSB E1 Bin 1000: MSB E4	4,16(0x10)
Impulse digital output control Activated = Closed (1) Deactivated = Opened (0) Minimum 0 Maximum F	0x1500	0000: deactivated pulses 0001: Output impulse 1 0003: Output impulse 1&2 Bin 0001: LSB E1 Bin 1000: MSB E4	4,16(0x10)

First we read count value D4, then we apply one pulse on input 1 so one count more

Then we read value D5, so it is counting and we are Reading correctly



So the right command is 62 04 00 00 00 02 (78 58) with a length of 6 bytes

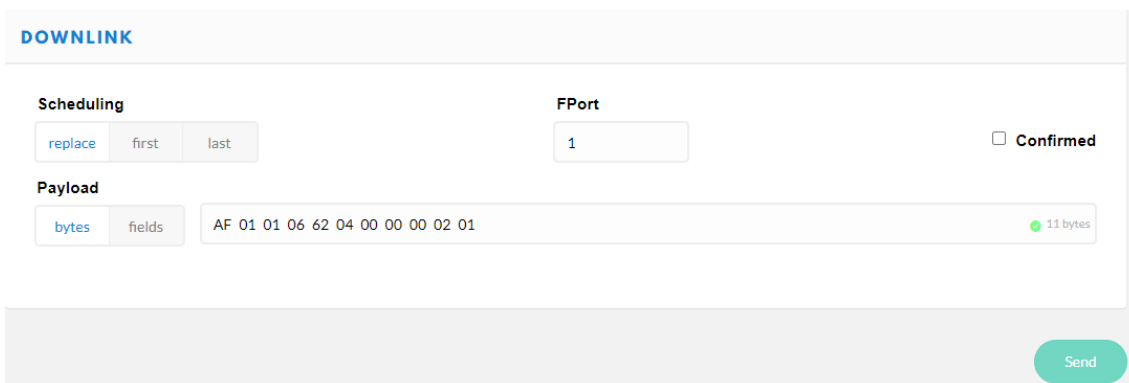
And the data is located on bytes 6 to 7

So the right commands are

AT+COMMAND1=62 04 00 00 00 02,1

Or downlink

AF 01 01 06 62 04 00 00 00 02 01



Example:

AF 03 01 06 0A 05 00 04 00 01 00: Same as AT+COMMAND3=0A 05 00 04 00 01,1

AT+DATACUT1=9,2,6~7 or AT+DATACUT1=9,2,6+7

Or downlink

AF 01 02 04 09 02 06 07 01

DOWNLINK

Scheduling

replace first last

FPort: 1

Confirmed

Payload

bytes fields AF 01 02 04 09 02 06 07 01 9 bytes

Send

AF 03 02 06 10 01 05 06 09 0A 00: Same as AT+DATACUT3=16,1,5+6+9+10

AF 03 02 06 0B 02 05 07 08 0A 00: Same as AT+DATACUT3=11,2,5~7+8~10

Type Code 0xAF

0xAF downlink command can be used to set AT+COMMANDx or AT+DATACUTx.

Note: if user use AT+COMMANDx to add a new command, he also need to send AT+DATACUTx downlink.

Format: **AF MM NN LL XX XX XX XX YY**

Where:

- ◇ MM: the ATCOMMAND or AT+DATACUT to be set. Value from 01 ~ 0F,
- ◇ NN: 0: no CRC; 1: add CRC-16/MODBUS ; 2: set the AT+DATACUT value.
- ◇ LL: The length of AT+COMMAND or AT+DATACUT command
- ◇ XX XX XX XX: AT+COMMAND or AT+DATACUT command
- ◇ YY: If YY=0, RS485-LN will execute the downlink command without uplink; if YY=1, RS485-LN will execute an uplink after got this command.

Example:

AF 03 01 06 0A 05 00 04 00 01 00: Same as AT+COMMAND3=0A 05 00 04 00 01,1

And it Works

Now the payload is incrementing as son as we closet he contacto n input 1

APPLICATION DATA || pause 🗑 clear

Filters: uplink downlink activation ack error

	time	counter	port	
▲	23:04:00	127	2	payload: 01 01 0D rpm: 269
▲	23:03:50	126	2	payload: 01 01 0C rpm: 268
▲	23:03:40	125	2	payload: 01 01 0C rpm: 268
▲	23:03:30	124	2	payload: 01 01 0B rpm: 267
▲	23:03:20	123	2	payload: 01 01 0A rpm: 266
▲	23:03:10	122	2	payload: 01 01 0A rpm: 266
▲	23:03:05	121	2	payload: 01 01 0A rpm: 266
▼	23:02:59		1	payload: AF 01 02 04 09 02 06 07 01
▲	23:03:00	120	2	payload: 01 00 00 rpm: 0
▼	23:02:53		1 <i>scheduled</i>	payload: AF 01 02 04 09 02 06 07 01

Now we need to change the payload decoder to see counter instead of rpm

PAYLOAD FORMATS

Payload Format

The payload format sent by your devices

Custom

decoder converter validator encoder

```

1 function Decoder(bytes, port) {
2   // Decode an uplink message from a buffer
3   // (array) of bytes to an object of fields.
4   var decoded = {};
5
6   if (port === 2) decoded.counter = bytes[1]*256+bytes[2];
7
8   return decoded;
9 }

```

APPLICATION DATA

Filters: uplink downlink activation ack error

	time	counter	port				
▲	23:08:50	156	2	dev id: 87654321	payload: 01 01 40	counter: 320	
▲	23:08:40	155	2	dev id: 87654321	payload: 01 01 40	counter: 320	
▲	23:08:30	154	2	dev id: 87654321	payload: 01 01 3F	counter: 319	
▲	23:08:20	153	2	dev id: 87654321	payload: 01 01 3E	counter: 318	

If I take power off we have to resend again the downlinks since the programmed commands are lost ¿??

DOWNLINK

Scheduling

replace first last

FPort

1

Confirmed

Payload

bytes fields

AF 01 01 06 62 04 00 00 02 01

11 bytes

Send

DOWNLINK

Scheduling

replace first last

FPort

1

Confirmed

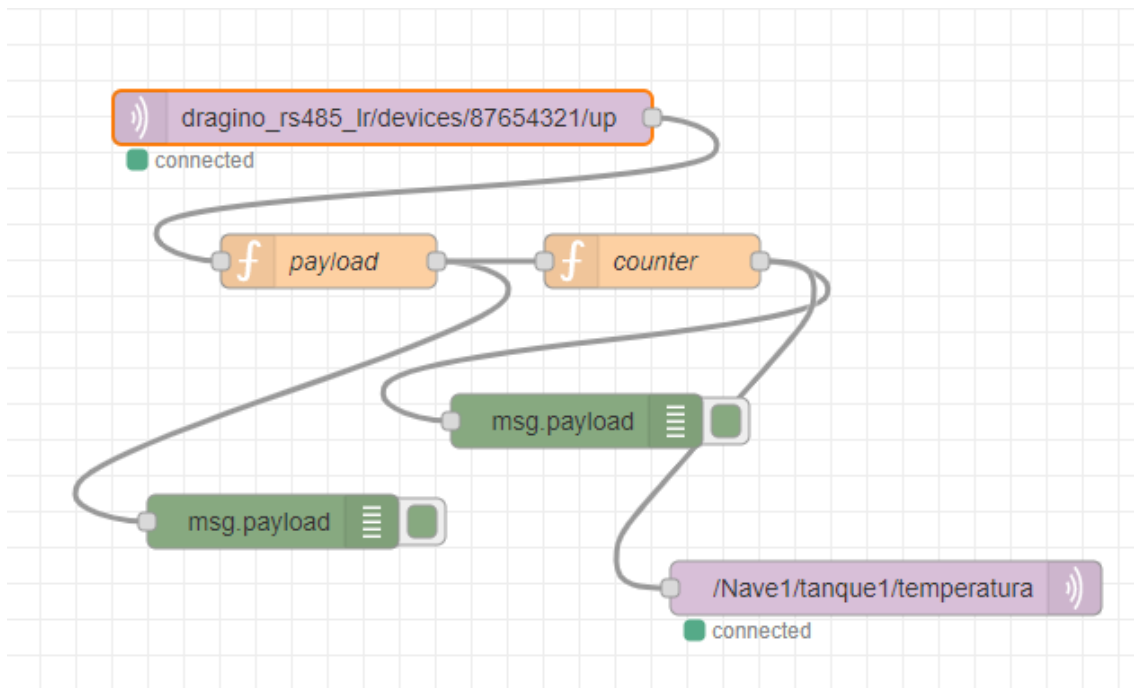
Payload

bytes fields

AF 01 02 04 09 02 06 07 01

9 bytes

Send



```

2/10/2020 14:31:12 node: 2e8d2b6e.7ca774
msg.payload : number
430

2/10/2020 14:31:22 node: 735d80b2.fa28f
msg.payload : Object
  { counter: 430 }

2/10/2020 14:31:22 node: 2e8d2b6e.7ca774
msg.payload : number
430

2/10/2020 14:31:32 node: 735d80b2.fa28f
msg.payload : Object
  { counter: 430 }

2/10/2020 14:31:32 node: 2e8d2b6e.7ca774

```

And with this Flow you send the counter data to the mobile

As you can see on this video

[MIO40 to LoRaWAN](#)

And you can find the code here

<https://github.com/xavierflorensa/Water-meter-to-LoRaWAN>

Now we want to reset the counter with this command

Writing on address

But this will be covered on further versions