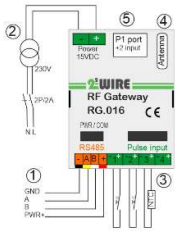


## RG.016 RF Gateway (MEMO3)



The RF gateway has 4 binary/analog inputs (counting and/or time-measuring and/or temperature measurement), one serial input P1 (DSMR 2.x,4.x,5.x), an RF868MHz transceiver, a Modbus connection.

### Sec. 1. Connect:



#### Nutrition:

**Communication via Modbus: (1)**  
The RF Gateway is connected to the MEMO web server via Modbus (4 conductors) and is also powered from there.

**Communication via RF:**  
Only here external power supply(2) 15VDC needed, automatic fuse provided 2P/6A Use wire with section **0.5mm<sup>2</sup>** and with solid core to fit in the terminals

#### (5)P1 port:

Connect the P1 port directly to the digital meter (RJ11 4P/4C) via an RJ11 cable (max.3 meter length).

#### (3)Analog/Binary Inputs:

Up to 4 pulse inputs (0..5V, 2mA) can be connected to the gateway (regardless of Modbus or RF). The mode in the configuration determines the type of input: Counter (pulses) or Time (timebase), or Temperature (NTC sensor). The location in the configuration determines the hardware input: Line 1= input 1; line 2 = input 2,...

- Pay attention to polarity if the impulse generator is a semiconductor.
- This impulse generator must be 'potential-free', otherwise an optical isolator must be placed.
- The pulse duration should be greater than 20msec and the speed between 2 pulses should not be faster than 10 pulses/sec.
- The distance to the encoder may be 2 metres (max. section 0.5mm<sup>2</sup>). If a larger distance (max 10m) should be used, shielding connected to the grounding.
- Use wire with section 0.5mm<sup>2</sup> and solid core to fit into the terminals

#### (4)Antenna:

Screw the supplied antenna onto the SMA connector, order an antenna with magnetic base when mounted in a metal cabinet.

#### LoRa-FSK:

Underneath the antenna socket there is a jumper. This MUST be present for use with the WS.503 as this is the selector for 'FSK' or 'LORA'. Delete only if the GW is used with the MILO (FSK only).

#### (1)Modbus:

At the bottom left a 4-pin Modbus connector: 1=GROUND, 2 = A, 3 = B, 4 = power supply from the Memo Use shielded EIB bus cable 4x 0.5mm<sup>2</sup> and with solid core (Max. 50 meters) and respect the color code GAB=black, yellow and white. Line topology can be terminated and both bus ends between A and B terminal with end resistor 120 Ohm.

#### Wired or wireless:

In addition to pulse inputs and the P1 port, the meters type EMM.xxx meters are also wirelessly connected to MEMO3.

## 2. Configuration in MEMO3:

Login as installer under Level3: password 'Level3' and then press

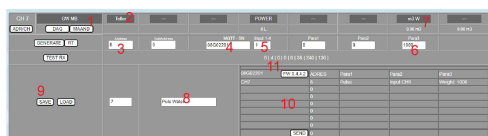


'CANCEL'. Create a channel with 'ADD CHANNEL x(Y)'. When the channel appears, click on the CHx button so that the channel configuration opens.

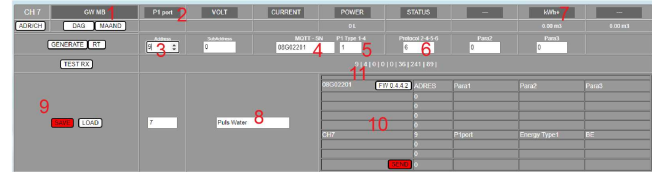
#### Wired via Modbus

(1) For module type you choose 'GW MB' and for (2) mode you choose :

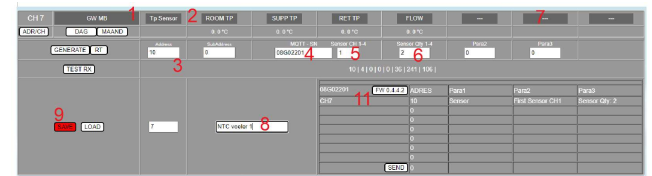
- (2)'Counter'. (4) Enter the serial number e.g. '08G02201'. (5) Choose Input 1,2,3,4. (6) For para 3(6), give pulse weight = number of pulses for 1 unit (e.g. 1000 pulses = 1m<sup>3</sup> water). (7) Choose the unit. (8) Give name



- (2)'Time'. (4) Enter the serial number e.g. '08G02201'. (5) Choose an input 1,2,3,4. (6) For para 3, enter constant consumption after 1 hour (e.g. 2450 ml fuel oil after 1 hour of operation) and select the appropriate unit(7)
- (2)'P1 port'. (4) Enter the serial number e.g. '08G02201'. (5) Choose P1 Type where 1 = IMPORT H+L, 2 = EXPORT H+L, 3 = GAS, 4 = WATER and (6)fill Protocol (DSMR 5 Belgium = 6) and (7)choose the correct unit . (8) Give a name.



- (2)'Tp sensor', (4)Enter the serial number e.g. '08G02201'. Choose Input(5) 1,2,3,4 and enter a number of consecutive sensors at (6)Sensor Qty because they have to physically come one after the other.



- (3) Enter **Modbus address** and that **MUST be unique and therefore DIFFERENT for each channel** of this RG.016 module. If necessary, click on the on/off button 'ADR/CH' to get an overview of the different addresses. (9) Press 'SAVE'
- (10) Summary table of max. 8 inputs on the RG module
- (11) Press to upgrade the module.

#### UPGRADING FIRMWARE:

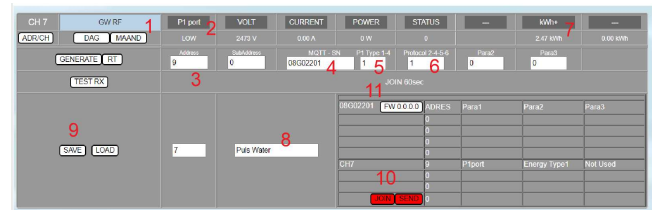
In the MEMO you can see under 'configuration' under 'SETTINGS' under 'FIRMWARE VERSIONS' whether the current FW is current. If there is a new version for 'RF GATEWAY RG.016', you can press 'DOWNLOAD' and download the latest version from the internet. Once the firmware is loaded, you can upgrade with (11) the RG.016 module.

#### Wireless via LoRa

One can connect one or more RG.016 modules to MEMO3 via LoRa:

- For LoRa communication, the black JUMPER (just behind the antenna) must be on 2 pins. (With MILO RF FSK communication on only 1 PEN).
- In the case of wireless, the module must also be externally powered via a 15VDC.
- At the time of submission, the module must be 'joined' with MEMO3.

The configuration of the P1 inputs and the Puls inputs is done just like with the wired configuration, only here you choose the module type 'GW RF' and you have to JOIN the module for the first channel. As an example, we give a wireless connection with a P1 port input:



- (1) For module type you choose 'GW RF' and for (2) mode you choose either:

- 'P1 port'. (4) Enter the serial number e.g. '08G02201'. (5) Choose P1 Type where 1 = IMPORT H+L, 2 = EXPORT H+L, 3 = GAS, 4 = WATER and (6)fill Protocol (DSMR 5 Netherlands = 5) and (7)choose the correct unit . (8) Give a name.

NA. The protocol: 4 = NL 4.0, 5 = NL 5.0, and 6 = 5.0 BE. Of course, the protocol must be the same for every P1 channel used!

NA. Choose the units according to the data: kWh or m3 of gas or water NA. On the digital meter itself, gas MBUS meter must be meter 1, and water or gas meter 2 Mbus meter 2 (Max. 2 Mbus modules read via P1)

- (3) Enter **Modbus address** and that **MUST be unique and therefore DIFFERENT for each channel** of this RG.016 module. Click on the 'ADR/CH' button to get an overview of the different addresses. (9) Press 'SAVE'
- (10) Summary table of max. 8 inputs on the RG module
- (11) The module is now ready to JOIN.

**JOIN**

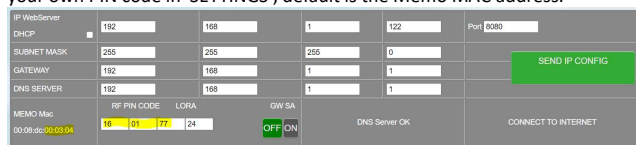
(10) To pair press 'JOIN', then energize the RF Gateway ( JOIN mode). Both LEDs on the GW will now blink alternately for 1 minute. Now press 'SEND' to pair the gateway with the MEMO3. (11) For 60 seconds, MEMO3 will try to 'join' with this gateway.

When answering 'JOIN OK', the GW is paired and the flashing of the LEDs stops. The firmware version of the gateway should appear and both will be paired. Optionally, you can try to upgrade via LoRa by pressing the Firmware button. (Takes a bit longer via RF, so better upgrade via Modbus).



**JOIN PIN code :**

As already described, all RF modules and the gateways must be assigned a PIN code for security of the RF network. With the MEMO you can enter your own PIN code in 'SETTINGS', default is the Memo MAC address.



When replacing a Memo, one enters the MAC of the previous Memo.

**EMM.xxx wirelessly pair over LoRa with the RF gateway**

Create a new channel and choose module type 'EMM.220-630' with mode 'energy'. Enter the unique Modbus address of the EMM.630 along with the desired sub-address ( 0= phase1; 1=phase2; 2=phase3).

In the MQTT-SN box, the Serial Number of the Gateway module (e.g. 08G02201) and SAVE the configuration. If the RF gateway has not yet been 'joined', you can do so as described above under 'JOIN'.

**LORA SETTINGS**

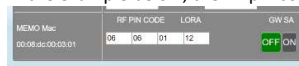
SETTING	SP	SYMBOLS	CF	RFW (MHz)	TR (ms)	RF ON AIR
01	7	512.4.5	525	512.4.5	525	LONGEST RANGE
02	7	512.4.6	525	512.4.6	525	LONGEST RANGE
03	7	512.4.7	525	512.4.7	525	LONGEST RANGE
04	8	256.4.5	525	256.4.5	525	
05	8	256.4.6	525	256.4.6	525	
06	8	256.4.7	525	256.4.7	525	
07	8	256.4.8	525	256.4.8	525	
08	9	512.4.5	525	512.4.5	525	
09	9	512.4.6	525	512.4.6	525	
10	9	512.4.7	525	512.4.7	525	
11	9	512.4.8	525	512.4.8	525	LONGEST RANGE
12	7	512.4.5	250	512.4.5	250	SM DRUM RANGE
13	7	512.4.6	250	512.4.6	250	SM DRUM RANGE
14	7	512.4.7	250	512.4.7	250	SM DRUM RANGE
15	7	512.4.8	250	512.4.8	250	SM DRUM RANGE
16	8	256.4.5	250	256.4.5	250	
17	8	256.4.6	250	256.4.6	250	
18	8	256.4.7	250	256.4.7	250	
19	8	256.4.8	250	256.4.8	250	
20	9	512.4.5	250	512.4.5	250	
21	9	512.4.6	250	512.4.6	250	
22	9	512.4.7	250	512.4.7	250	
23	9	512.4.8	250	512.4.8	250	
24	7	512.4.5	500	512.4.5	500	SHORT RANGE
25	7	512.4.6	500	512.4.6	500	SHORT RANGE
26	7	512.4.7	500	512.4.7	500	SHORT RANGE
27	7	512.4.8	500	512.4.8	500	SHORT RANGE
28	8	256.4.5	500	256.4.5	500	
29	8	256.4.6	500	256.4.6	500	
30	8	256.4.7	500	256.4.7	500	
31	8	256.4.8	500	256.4.8	500	
32	9	512.4.5	500	512.4.5	500	
33	9	512.4.6	500	512.4.6	500	
34	9	512.4.7	500	512.4.7	500	
35	9	512.4.8	500	512.4.8	500	

With RF, large distances can be bridged, provided the right settings are made. Usually, 20 meters should not be a problem and the setting does not play much of a role. If greater distances are required, or there are concrete walls, it may be necessary to adjust the RF settings. In the WS.503 we go to 'SETTINGS': here you can see the PIN code and the LORA setting. By default, the PIN is the last 3 digits of the MAC address. (HEXADECIMAL !) If you wish, you can change this PIN code of your choice. (NOTE: change PIN code or LORA is 'JOIN' all RF modules again!

In the case of LORA, a number between 0 and 35 can be entered. The lower the number, the greater

the distance, but at the expense of response time. (the more RF channels, the longer the orbital time to retrieve data for the real-time measurements. Sometimes 1 minute is not achievable, so the resolution of the logs becomes more than 1 minute.). Below is a table for the LORA setting: (time on air for package approx. 40 bytes)

In the example below, the RF pin code is that of a MiLo server and the



LoRa is set to 12 MEDIUM RANGE

**7. Technical data:**

- RF frequency: 868-869 MHz with adjustable LoRa settings
- RF modulation: FSK or LORA (via JUMPER on the RG.016 module)
- Max RF power: +15dBm, Transmitting power: 10mW
- Sensitivity: FSK: -105dBm / LORA: -130dBm
- Range indoor/outdoor: FSK: approx. 30m/100m; LORA 50m/300m

**Operating conditions:**

- Operating temperature range: 10 °C to 50 °C
- Storage temperature range: -10 °C to 60 °C
- Maximum humidity: 90 % no condensation, Max. altitude: 2000m

**Physical Properties:**

- Housing: plastic, self-extinguishing according to . UL94-V0
- Degree of protection: IP20, EN 60529
- Mounting indoors or in waterproof housing
- Dimensions (hwxw): 62mmx90mmx36mm, 65 grams

**Connections:**

**Inputs:** Digital or Analog NTC 10k

- Digital Input(IN1... 4): Potential-free !! max 5V/2mA (0-logic: < 0.7V) pulse duration: min. 10 ms, max 10 pulse/sec.
- Analog inputs(IN1... 4): temperature sensor NTC 10k range – 15 to +85°C

**P1 port:** digital meter BE+NL (DSMR 2.x;4.x;5.x)

**Power supply:**

- Wired: power supply via Modbus (-,A,B,+)
- Wireless: External 15VDC/1.5A (MeanWell DR-15-15)

**Modbus :** G,A,B,+ connect

**Labels:**

- RoHS: Non-toxic, cf. WEEE/RoHS Directives
- CE: In accordance with EMC and low voltage directive: HBES – EN 50090-2-2 and EN60950 – 1: 2006.

**8. Installation instructions**

Installation must be carried out by a certified installer and in accordance with the regulations in force. The module must be built into a fireproof fuse box. During installation, the following must be taken into account (non-exhaustive list):

- the applicable laws, standards and regulations.
- the state of the art at the time of installation.
- This manual, which only mentions general provisions and should be read in the context of each specific installation.
- the rules of good workmanship.
- the specified specs in this manual, otherwise there is a risk of damage to the module.

This manual must be attached to the electrical installation file. On the 2-Wire website you can always find the most recent manual of the product.

**9. Support**

Would you like to have the product repaired in case of a possible defect? Please contact your supplier or order "inspection module" online.

**10. Warranty provisions**

The warranty period is two years from the date of delivery. The delivery date is the invoice date of purchase of the product by the consumer. If no invoice is available, the production date applies. The consumer is obliged to inform Qonnex bvba in writing of the lack of conformity, and this at the latest within two months after discovery. In the event of a lack of conformity, the consumer is only entitled to a free repair or replacement of the product, which is determined by Qonnex.

Qonnex is not responsible for a defect or damage resulting from incorrect installation, improper or negligent use, incorrect operation, transformation of the product, maintenance in violation of the maintenance instructions or an external cause such as moisture damage or damage due to overvoltage. The mandatory provisions in national legislation on the sale of consumer goods and the protection of consumers in countries where Qonnex sells directly or through distributors, agents or permanent representatives take precedence over the above provisions.

Qonnex bv B-9310 Aalst Belgium [info@2-wire.be](mailto:info@2-wire.be) [www.2-wire.net](http://www.2-wire.net)

**General:**

Din rail module for RF communication to the MILO or MEMO.



Qonnex