Sommario

QBR1A


PRELIMINARE


RESET
BOOT
FUNC
MMC
SD
PROG
PORT
SIM
CARD
USER
PORT
qem

1. Informations

1.1 Release

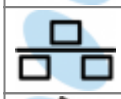
Document release	Description	Note	Date
01	New manual	Valid for hardware release 01	20/06/2012

The controller has been designed for industral environments in conformity to EC directive 2004/108/CE.

- EN 61000-6-4: Electromagnetic compatibility - Generic standard on emission for industrial environments
  - EN55011 Class A: Limits and measurement methods
  - EN 61000-6-2: Electromagnetic compatibility - Generic standard on immunity for industrial environments
    - EN 61000-4-2: Electromagnetic compatibility - Electrostatic discharge immunity
    - EN 61000-4-3: Immunity to radiated, radio-frequency electromagnetic field
    - EN 61000-4-4: Electrical fast transients
    - EN 61000-4-5: Surge immunity
    - EN 61000-4-6: Conducted disturbance induced by radio-frequency
    - Moreover the product is conform to the following standards:
      - EN 60529: Housing protection rating IP64
      - EN 60068-2-1: Environmental testing: Cold
      - EN 60068-2-2: Environmental testing: Dry heat
      - EN 60068-2-14: Environmental testing: Change of temperature
      - EN 60068-2-30: Environmental testing: Cyclic damp heat
      - EN 60068-2-6: Environmental testing: Sinusoidal vibration
      - EN 60068-2-27: Environmental testing: Shock vibration
      - EN 60068-2-64: Environmental testing: Random vibration

2. Description

QBR1A is a LAN/GPRS router produced for the Teleassistance of QEM products.
It can be equipped with:

Standard equipment	
	8 system leds
	1 serial (RS232/TTL) COM1 (Use in combination with the accessory IQ009)
	1 multistandard serial (RS232/422/485) - COM2
	1 ETHERNET port
	1 Memory Card MMC/SD reader
	Clock calendar
	2 standard digital inputs
	2 digital outputs
Optional equipment (Refer to the table Hardware versions)	
	1 multistandard serial (RS232/422/485) – COM3 PORT
	1 CANbus port
	8 standard digital inputs
	8 digital outputs

2.1 Product Identification

The Ordering Code provides the exact product features.
Make sure that the product features meet your requirements.

2.1.1 Product Label

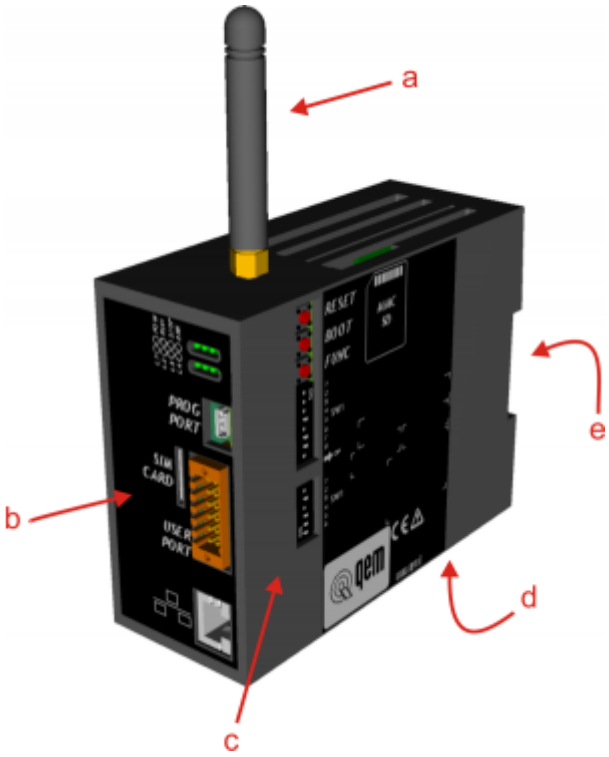
- **a - Ordering Code**
- **b - Week made**: indicates the week and year of manufacture
- **c - Part number**: unique code that identifies an ordering code
- **d - Serial number**: product serial number, different for individual product
- **e - Hardware release**: version of hardware release

2.1.2 Hardware versions

There are currently 2 hardware versions:

Ordering code	Features	Part Number
QBR1A01E0/0/24V	Router LAN	94020001
QBR1A01E0/GPRS/24V	Router LAN/GPRS	94020002

2.2 Product Configuration



- **a** = GPRS antenna
- **b** = connections side
- **c** = settings side
- **d** = power supply and I/O connectors
- **e** = connection for Omega DIN

2.2.1 Firmware versions

Version	Description
01	Connection with QNet, with GPRS and LAN modem

3. Electrical features

3.1 General features

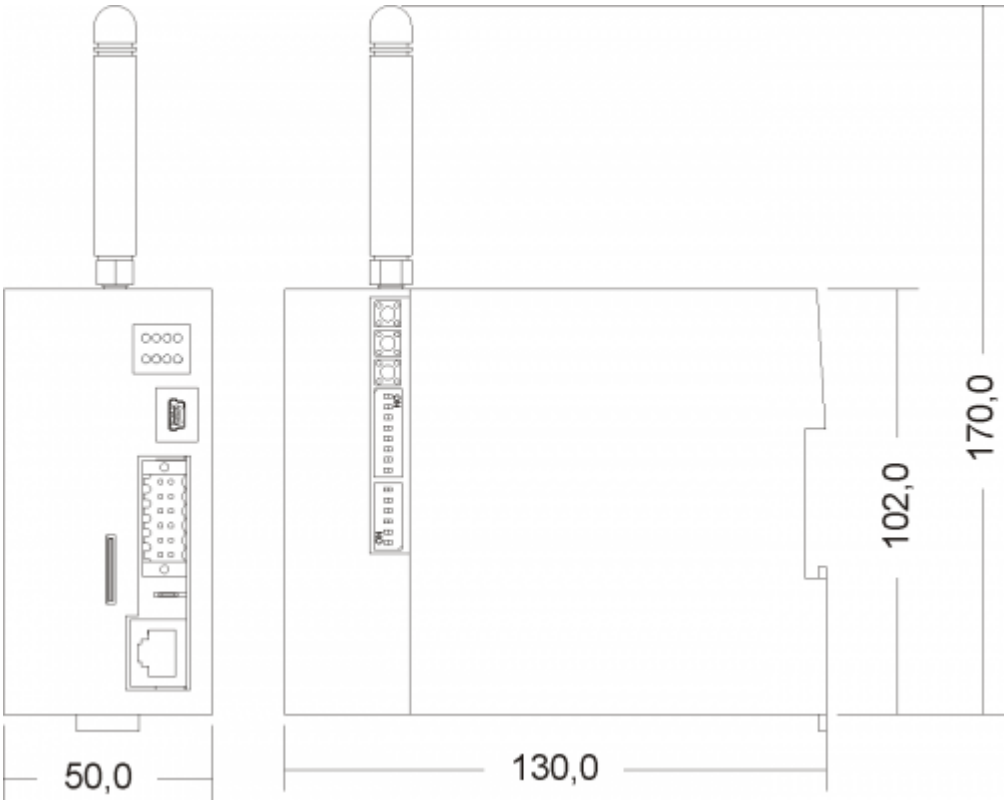
Weight (maximum hardware configuration)	Fix Me!
Box material	Fix Me!
Signal leds	8
System keyboards	24
Working temperature	0 ÷ 50°C
Relative humidity	90% without condensation
Altitude	0 - 2000m s.l.m.
Transport and storage temperature	-25 ÷ +70 °C
IP protection	IP20

3.2 CPU (F level technology)

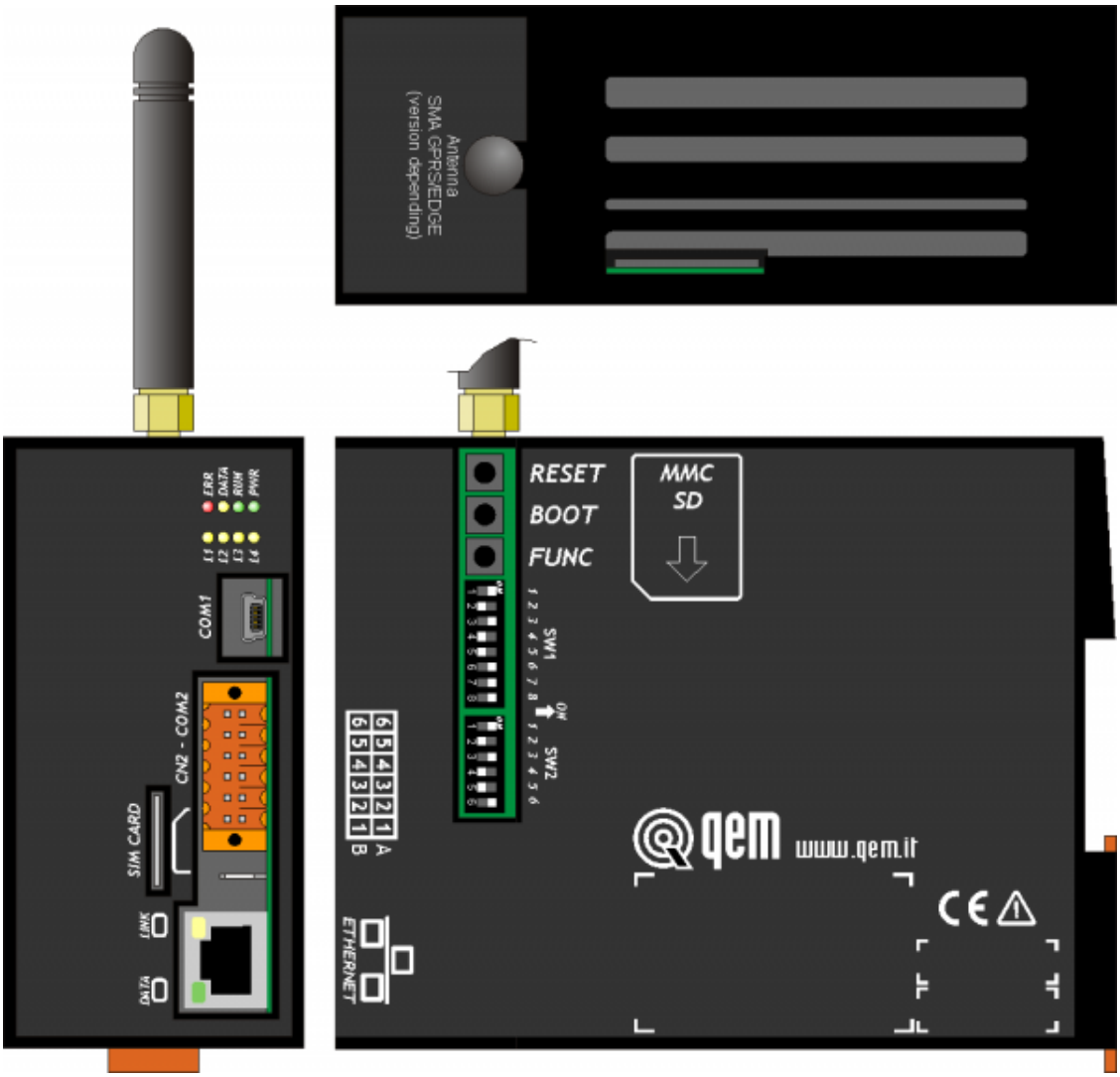
RISC microprocessor (32 bit)	
Work frequency	200MHz
RAM	16MB
Flash	8MB

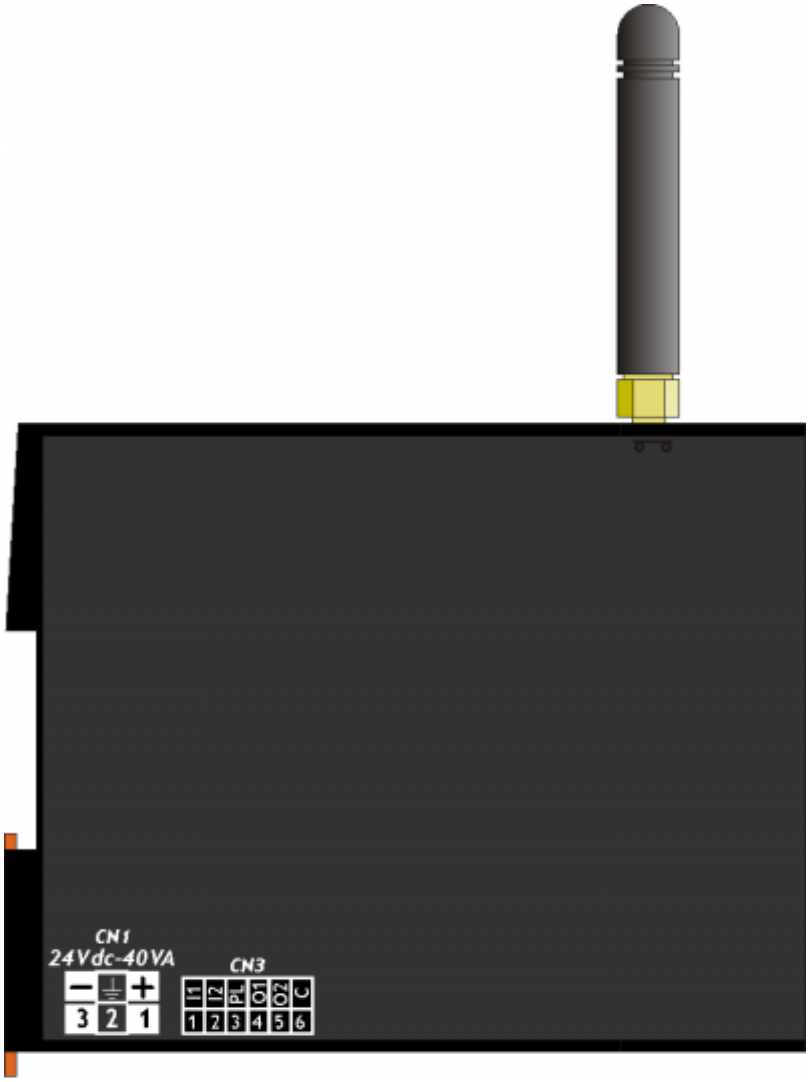
3.3 Dimensions

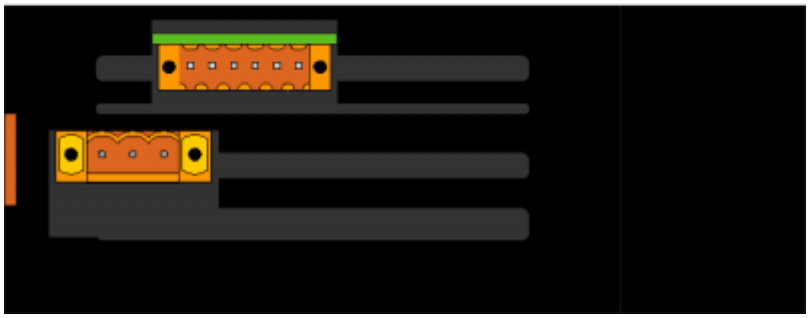
Lengths in mm



4. Electrica features and connections



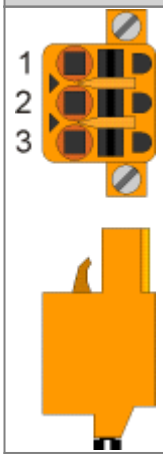

CN1
24Vdc-40VA
3 2 1
CN3
I1 I2 PE NO NC C
1 2 3 4 5 6



4.1 Power supply

	**• The wiring must be installed by skilled personnel and with appropriate antistatic measures.** **• Before handling the tool, disconnect the power supply and all the parts connected to it.** **• To ensure compliance with EC regulations, the power supply must have a galvanic insulation of at least 1500 Vac.**

Power supplies available	**24 Vdc**
Range	22 ÷ 27 Vdc
Max. absorption	 DISTINGUERE I 2 MODELLI

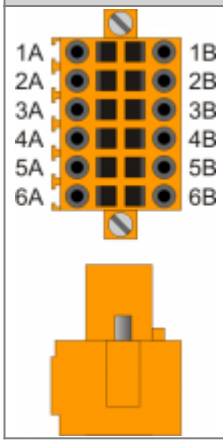
CN1	Terminal	Symbol	Description
	1	+	DC positive power supply
	2	TERRA	Ground-PE (signals)
	3	-	DC 0V power supply

4.2 COM1 PORT (USB mini-B)

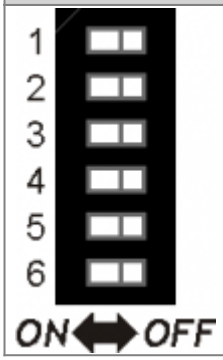
COM1 PORT	Description
	COM1 serial port TTL standard electric used for connection to a QMove+ product (DIP 8 of SW1 OFF) or to the PC for the Bridge configuration (DIP 8 of SW1 ON). In the latter case, you must use the IQ009 or IQ013 accessories.

4.3 COM2 PORT (multistandard)

4.3.1 Connettore COM2 PORT

CN2	Morsetto	RS232	RS422	RS485	Descrizione
	1A	-	-	A	Terminale A - RS485
	2A	-	-	B	Terminale B - RS485
	3A	0V	0V	0V	Comune COM2 PORT
	4A	0V	0V	0V	Comune COM2 PORT
	5A	TX	-	-	Terminale TX - RS232
	6A	Terra			
	1B	-	RX	-	Terminale RX - RS422
	2B	-	RXN	-	Terminale RX N - RS422
	3B	-	TX	-	Terminale TX - RS422
	4B	-	TXN	-	Terminale TX N - RS422
	5B	RX	-	-	Terminale RX - RS232
	6B	Terra			

4.3.2 COM2 PORT standard settings

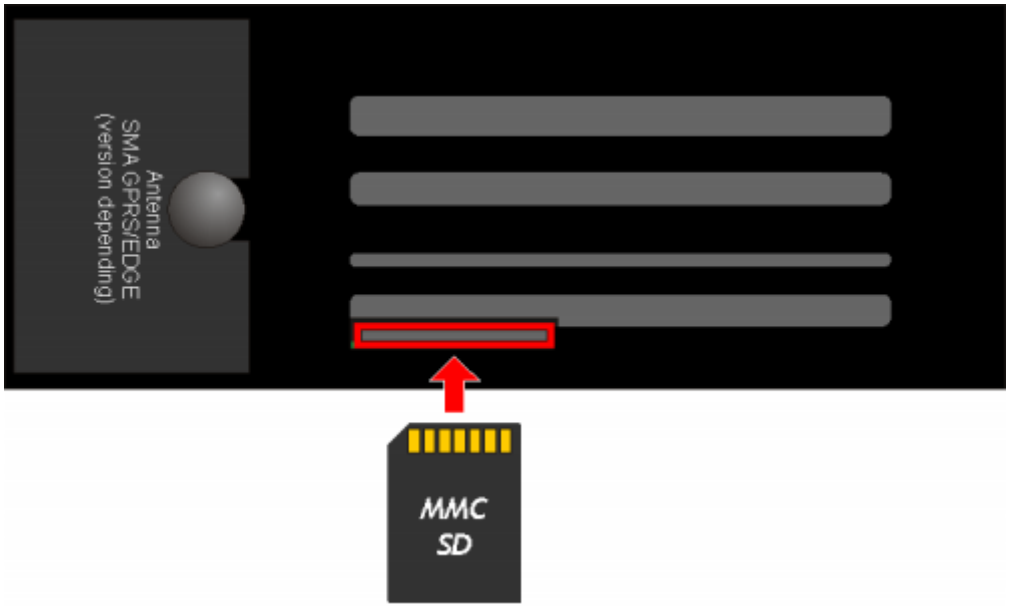
SW2	Num. Dip	Name DIP	Setting of the DIP			Function
	1	JP2	ON	X[1)]	X[2)]	Termination RS485
	2	JP3	ON	X[3)]	X[4)]	Polarization RS485
	3	JP1	ON	X[5)]	X[6)]	
	4		OFF	ON	OFF	COM2 PORT standard settings selection
	5		ON	OFF	OFF	
	6		OFF	OFF	ON	
			RS485	**RS422**	**RS232**	

[1), 2), 3), 4), 5), 6)] X = not significant setting

4.4 ETHERNET PORT

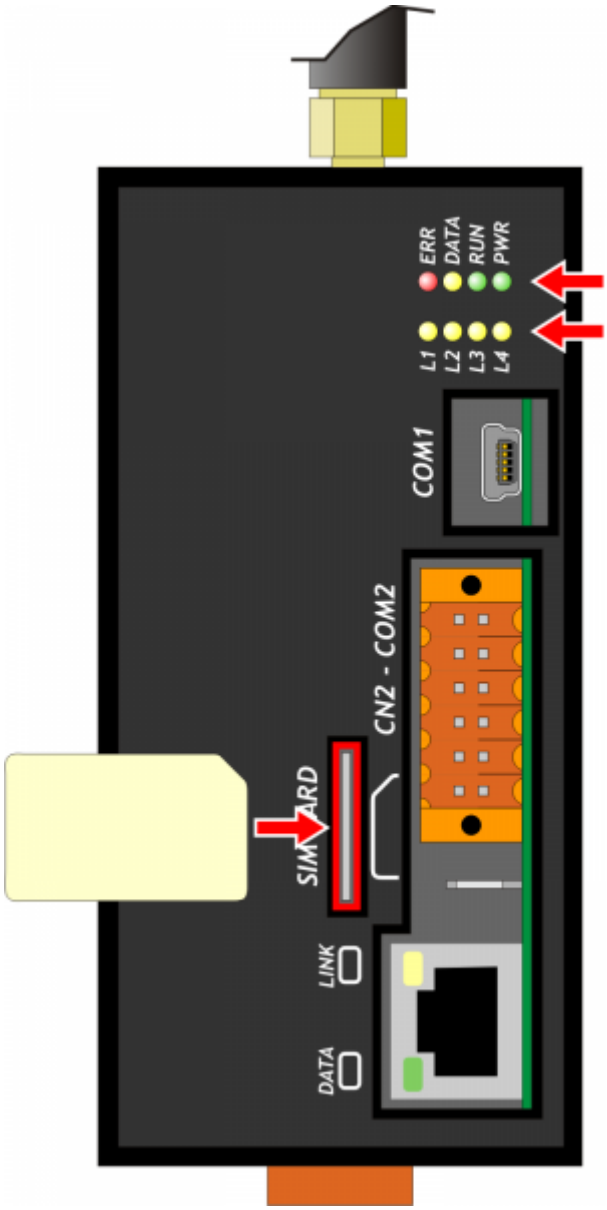
ETHERNET PORT	Description
	RJ45 connector. LED: * LINK: green led = cable connected * DATA: yellow led = data exchange (the flashing led indicates data communication between connected devices)

4.5 MMC/SD



Memory card slot (highlighted by the arrow)

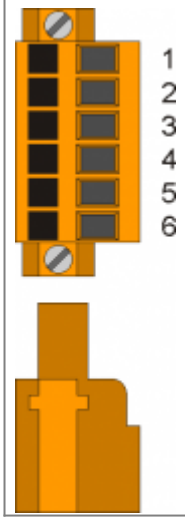
4.6 SIM CARD



Slot for SIM card (highlighted by the arrow)

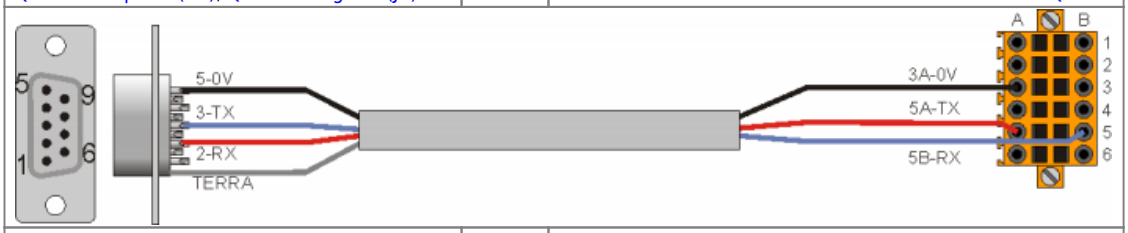
4.7 2 standard digital inputs and 2 standard digital outputs

	The electrical features are given in paragraph Electrical features. **The connection examples are provided in paragraph Connection examples**

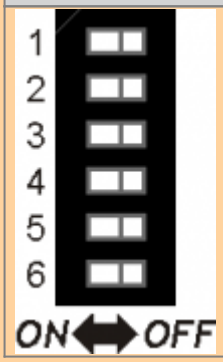
CN3	Terminal	Symbol	Description
	1	I1	Input I1
	2	I2	Input I2
	3	PL	Common of the digital inputs
	4	O1	Outputs O1
	5	O2	Outputs O2
	6	COM	Common of the digital outputs

5. Connection examples

5.1 Connection between QBR1A (COM2) and the Qmove (C1, J1) Prog port

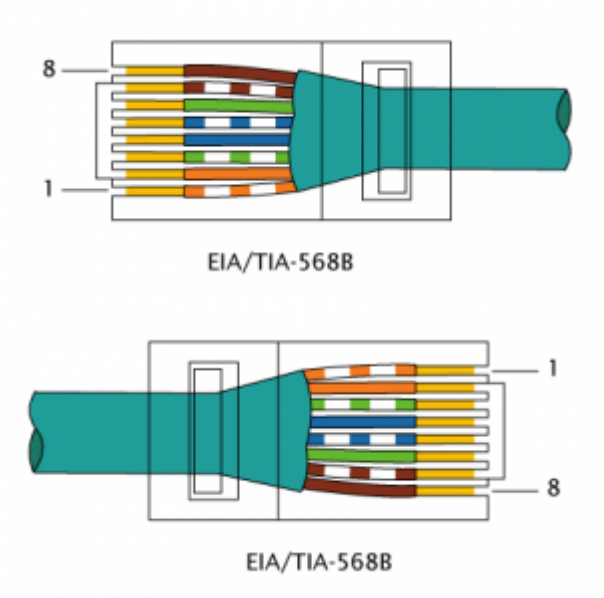
Qmove compatto (C1), Qmove integrato (J1)		QBR1A
		
DSUB 9P-M 22010025		WEIDMULLER B2L 3.5/12 22020159

Set the dip switch SW2 as in table:

SW2	Num. Dip	Setting of the DIP
	1	OFF
	2	OFF
	3	OFF
	4	OFF
	5	OFF
	6	ON

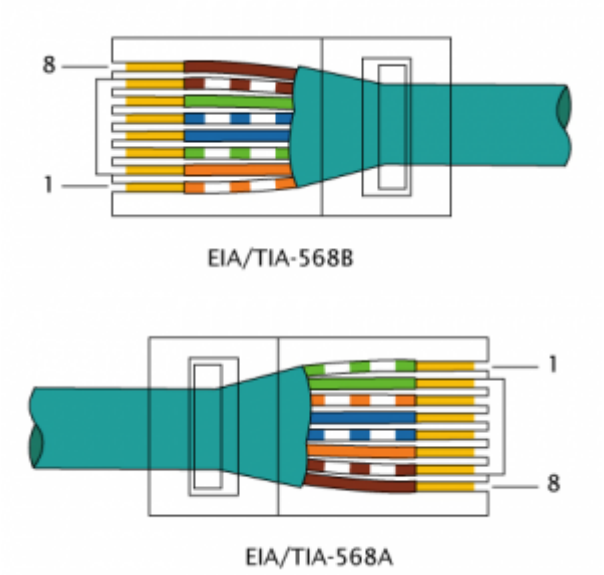
5.2 Connection between the PC and the QBR1A (LAN)

Is it necessary to use a **direct ethernet cable** as per specification EIA/TIA-568B-568B.

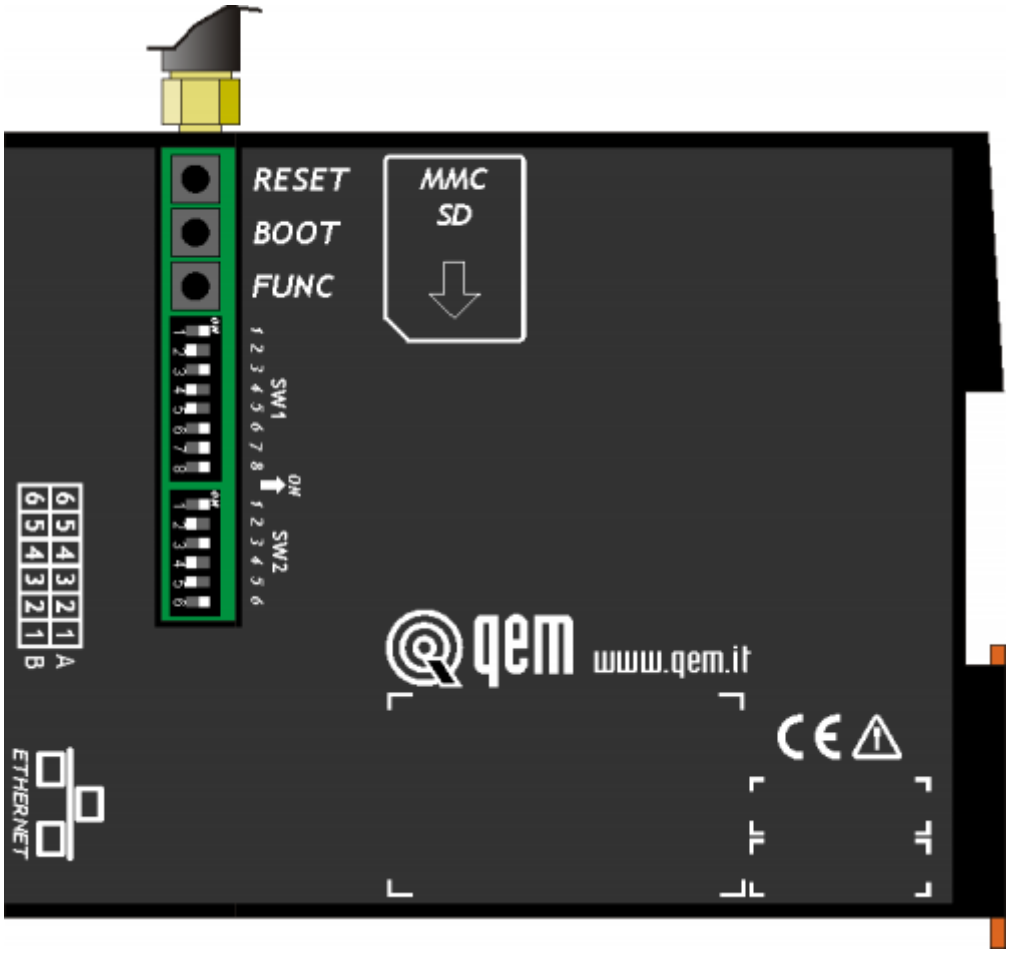


5.3 Connection between the QBR1A (LAN) and the QMove (LAN)

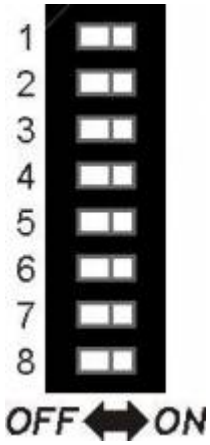
It is necessary to use an **ethernet crossover cable** specification EIA/TIA-568B-568A .



6. Settings, procedures and signals



6.1 SW1 selector

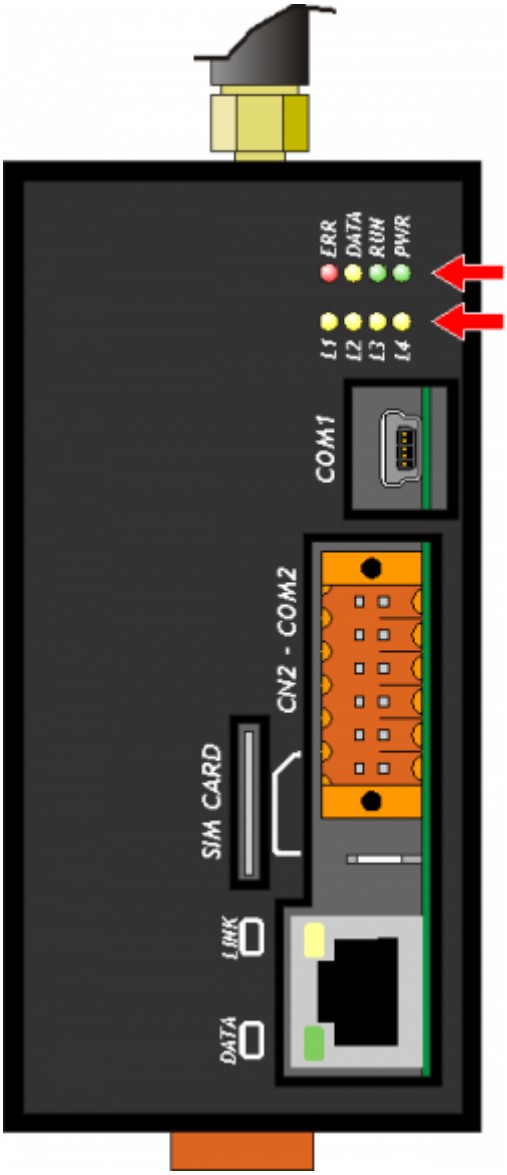
SW1	Dip	Name	Function
	1		n.u.
	2		n.u.
	3		n.u.
	4		n.u.
	5	AUTOUPDATE	**ON** = When you connect to the QNet network, checks for a new firmware and then download and upgrade. At the end system performs a Reboot. See section Upgrade Firmware
	6	DIAGNOSTICS	**ON** = Displays antenna signal strength in leds L1-L4 (see the section Fix Me!)
	7		n.u.
	8	RESOURCE CONFIGURATION	**OFF** = Select the COM1 (mini-USB) for communication with a QMove using the cable supplied with the accessories IQ009 or IQ013. **ON** = Put the Bridge in Configuration mode, select the COM1 (mini-USB) for communication with a QMove using the cable supplied with the accessories IQ009 or IQ013. **!!! WARNING !!!** *You must have special attention to the correct connection because the two different modes of operation reverse signals RX/TX then you could damage the electronic components.*

Default: only dips 5 and 6 ON

Fix Me! Verificare l'immagine del dip-switch: ON e OFF sono rovesci.

6.2 Led

The **“PWR, RUN, DATA, ERR”** leds are the system leds while the **“L1, L2, L3** and **L4”** leds are used to display different data depending on conditions/application settings.



6.2.1 Alerts

6.2.1.1 Leds meaning

Led ON

Led OFF

Led flashing

Led	Color	State	Description
PWR	Green		Bridge operative and communication module initialized.
			If this is the only lampegiante, led shows the status of communication module initialization. If **DATA** led flashing, reports that the Bridge is in edit mode **Configurazione/Configuration Mode**.
RUN	Green		Bridge waiting**Enabling the connection**.
			Short blinking = Bridge waiting **Activation command connection**. Slow blinking = Bridge to connect/disconnect to/from network QNet.
			Bridge connected to the network QNet.

Led	Color	State	Description
DATA	Yellow		If the **PWR** led is on, report the arrival the network information by QNet. If the **PWR** led flashing, report that the bridge is in **Configurazione/Configuration Mode**.
ERR	Rosso		If all other leds are in OFF, report an hardware error. See the section Hardware error codes. If the **PWR** led is flashing, report an error during the initialization phase of the communication module. In the case of GPRS modem make sure you have inserted the SIM card and the PIN code. If the **RUN** led is flashing, report an error during the QNet network connection. In the case of the GPRS modem make sure you have signal (see the section Antenna signal strength). You can view a description of the error message by using the utility BridgeConfigurator.

6.2.1.2 Hardware error codes

If a malfunction is detected when power on of any devices, the system hangs and the error is reported by the blinking of the led only ERR while all the other leds remain in OFF.

The flashing numbers indicates the error type as to the following table:

Flashing numbers	Error
1	Exception
2	FPGA
3	Media
4	Bootloader
5	Firmware
6	Resource
7	Modem
8	Memory write

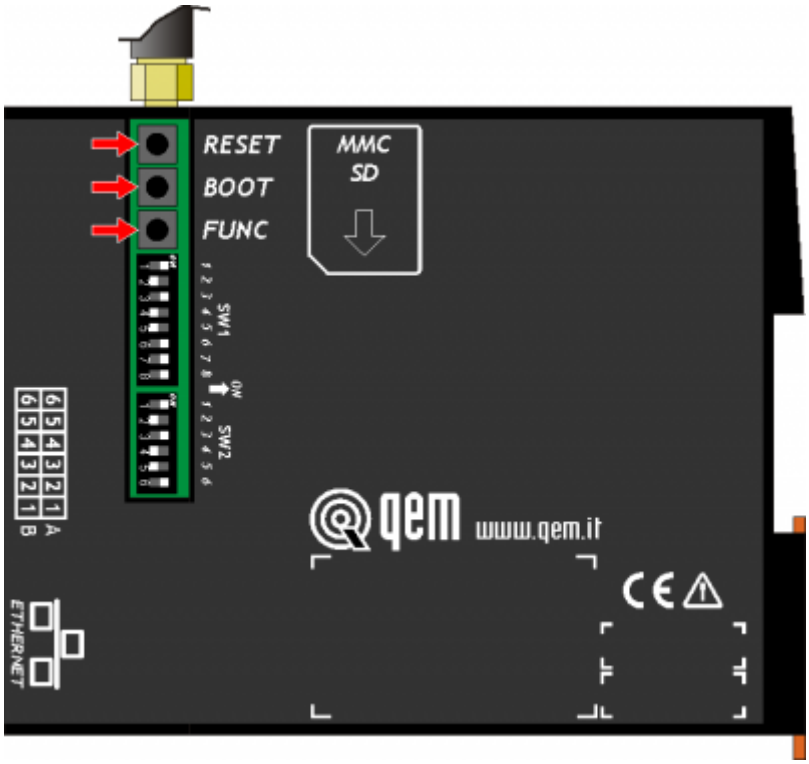
Each of these reports indicates a serious error. The product must be sent to customer support QEM.

6.2.1.3 Antenna signal strength

If you have a Bridge with GPRS modem antenna signal strength value (RSSI) you receive through the flashing of leds L1, L2, L3, L4.

L1	L2	L3	L4	Description
				No signal (-113 dBm o meno) o scarso
				-111 dBm < RSSI < -77 dBm Insufficient signal
				-77 dBm < RSSI > -69 dBm Sufficient signal
				-69 dBm < RSSI > -63 dBm Good signal
				RSSI > -63 dBm Optimal signal **In some cases, employees by the operator, this message appears even when no signal.**

6.3 Keys

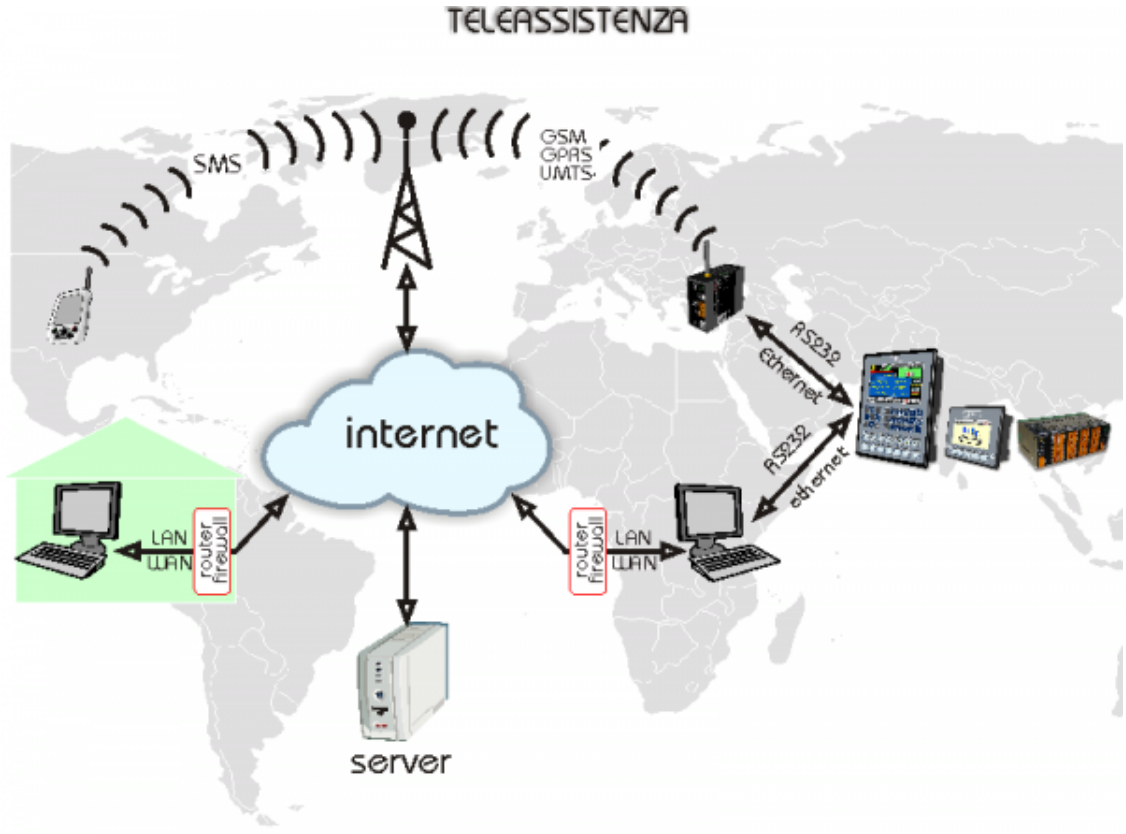


Fix Me! - Nel Bridge il RESET è all'esterno, quindi BOOT e FUNC.

Name	Description
 FUNC	If the condition of *Enable the connection* satisfied, pressed for at least 1 second to activate the QNet network connection (the **RUN** led flashes).
 BOOT	Pressed at power ON, set the instrument in Boot state, allowing access to firmware update.
 RESET	The system gets restarted.

7. The QNet network

The QNet network provides the structure for connecting two or more QRM nodes (Qem Resource Manager) through the Internet network.



7.1 The QRC server

The QRC (Qem Resources Control) server, is a server QEM that manages the connection permissions between the various network QNet nodes.

7.2 The QRM-QRMB

The QRM (Qem Resource Manager) or the QRMB (Qem Resource Manager for Bridge) are the Nodes that share, using the resources, the means to access more tools Qem.

7.3 The network QNet resources

Are considered **resources** all *communication channels* provided by various nodes QRM-QRMB to connect the different QMove systems.

7.4 Directions for network administrators

The connection to the QNet network using an encrypted protocol.
On a LAN network, therefore every Bridge will open a connection TCP/IP OUT on the gate **8005** way the server QEM QRC at the address **qrc.q-move.eu** (188.95.77.82). To enable the auto-update the firmware it is also necessary that the Bridge can take advantage of the FTP Protocol (gate TCP/IP 20-21) always log on to the server at the address in QEM QRC **qrc.q-move.eu** (188.95.77.82). To enhance safety on the LAN every other type of communication can be blocked.

8. General information of operation

8.1 Introduction

This chapter will introduce some concepts and describes some product operations. These contents are partly related and implemented in the firmware.

8.2 The Bridge resources

Are considered **resources** all the *comunication channels* provided by the Bridge to connect more QMove systems. The **channel** word will be synonymous with **resource**.
All serial port (COM) on the Bridge are resources. In the base versione there are two serials: COM1 and COM2. With the expansion is available the serial: COM3.
In the case of presence of the Ethernet port, 3 channels of communication are generated: LAN1, LAN2, LAN3.

In the maximum configuration, the Bridge can have 6 channels of communication, that can be connected to a QMove system.

8.3 The Manager channel

Is there a particular communication channel, used exclusively by the QNet network called **Manager**.
It safeguard all communication to the **QRMB**.

8.4 Conditions and Enables

To ensure that the Bridge run is the status of the connection if desired **Enable the connection**.
By default, the condition is satisfied as long as the **I1 input** is active. When the condition *Enable the connection* is satisfied, for default, the **O1 output** is active.

8.5 Operating States

This section describes the operating States.

8.5.1 Boot

The **Boot** phase, is the first to be performed after switching on (or the reset) of the instrument.
During this phase runs a scan of all leds.
If an hardware failure is detected, the system hangs and only **ERR** led flashes indicating the type of error (see the section Hardware error codes).

8.5.2 Recognition and Hardware configuration

The Bridge check that all devices are operational.
The phase is signalled by the blinking of the **PWR** led only.
In case of error the **ERR** led starts blinking.

One of the possible errors, in the presence of the **Modem 3G** module, is the non-inclusion of the SIM CARD or the PIN error (parameter *gprs1_pin*).

8.5.3 Connection request waiting

The Bridge is waiting to connect to the network QNet network.
The **PWR** led is steadily lit.
The **RUN** led, if in OFF, indicates that the conditions of qualification for the connection isn't verified.
When the enable conditions are met, the **RUN** led start flashes briefly and the **O1 output** is active.

8.5.4 Connection to a QNet network

The Bridge is connecting to the QNet network.
The **PWR** led is in ON and steadily lit and the **RUN** led is flashing continuously.

8.5.5 Firmware Upgrade

If the SW1 dip n°5 (AUTOUPDATE) is ON, before connecting to the QNet network, the Bridge check if a firmware update.
If it discovers an new firmware, it gets downloaded.
This stage is marked by a continuous flashing of L1, L2, L3 e L4 leds.

• At the end of the download the Bridge goes in the BOOT state to store in the flash the new firmware.
• DO NOT TURN OFF the Bridge.

Finished updating, the Bridge will automatically reboot.

8.5.6 Error

The error message occurs with the **ERR** led.
The Bridge, in some cases, attempts to do so failed.

8.6 Configuration

8.6.1 Bridge System Info

The following lists contain information parameters of Bridge, *Bridge System Info*, that can be read by the application Utility QRM BridgeConfigurator.

Name	Type	Default	Description
Firmware			
name	stringa	QBR1A	Nome del firmware in uso.
version	string	1.0.1	Current firmware version.
serial number	entire	12345678	Serial Number of the connected Bridge.
checksum	string	12345678	Checksum of the used firmware.
Timedate			
date	date	20120131	Data used, in the form **YYYMMDD**. *Example, 20120131, 31 gennaio 2012*
time	time	165513	Time used, in the form **hhmmss**. *Example, 165513, 16.55.13*
Module data: LAN			
Device LAN	string	2	Indicates that the connection to the server QRC is: LAN
manufacture	string		Producer
model	string		Model
mac	string		MAC address
dhcp	entire	0	DHCP Type
ip address	ip	192.168.0.253	IP address
netmask	ip	255.255.255.0	Netmask
gateway	ip	0.0.0.0	Gateway address
Module data: modem 3G			
Device 3G	string	2	Indicates that the connection to the server QRC is: LAN
manufacture	string		Producer
model	string		Model
fw	string		Firmware version
imei	string		IMEI code
iccid	string		ICCID code
imsi	string		IMSI code
Features			
mtu_qrm	entire		Specifies the MTU value of the QRMB server
mtu_bridge	entire		Specifies the MTU value of the Bridge
channels_com	entire	2	Specifies the available COM channels
channels_tcp	entire	0	Specifies the available TPC channels

8.6.2 Bridge System Settings

Lists the configuration parameters of the Bridge, *Bridge System Settings*, that can be modified by the application QRM BridgeConfigurator Utility.

Name	Type	Default	Description
Section QRM-Bridge			
qrc_ip	string	188.95.77.82 qrc.q-move.eu	IP Address/Hostname of the QRMB server that the Bridge connects.
qrc_port	number	8005	QRMB server TCP port number to which the Bridge connects.
Section FTP			
ftp_ip	string	188.95.77.82 qrc.q-move.eu	IP Address/Hostname of the FTP server athat the Bridge connects for firmware update.
ftp_port	number	21	FTP server TCP port number
ftp_user	string		User name for FTP server authentication. If empty, it is automatically generated by the Bridge.
ftp_pass	string		User password for authentication to the FTP server. If empty, it is automatically generated by the Bridge.
Section ETH (valid only with network interface)			
eth0_mac	string	00:00:00:00:00:00	MAC address of Bridge network interface (if present).
eth0_dhcp	number	0	Type of DHCP Client setting: 0 = disable
eth0_dhcpip	string	0.0.0.0	IP Address/DHCP Hostname server . *(currently not supported)*
eth0_ip	string	192.168.0.253	IP Bridge address.
eth0_nm	string	255.255.255.0	Network mask.
eth0_gw	string	192.168.0.1	IP gateway address.
eth0_dns1	string	0.0.0.0	DNS1 IP Address. *(currently not supported)*

Name	Type	Default	Description
eth0_dns2	string	0.0.0.0	DNS IP Address. *(currently not supported)*
GPRS Modem section (valid with the modem)			
gprs1_pdp	string	ibox.tim.it	GPRS context.
gprs1_pin	number		PIN code of the SIM (normally empty or 0000).
module_pref	number	0	**Default module**: With the Bridge who have both Ethernet interface and GPRS, indicates the module that is used when connecting to the QRC. 0 = LAN 1 = GPRS
Additional functionality			
fn_autoconnect	number	1	**Auto-login**: 0 = Disable (default) 1 = At the power ON of the Bridge the connection operations are enabled (simulates I1 on). 2 = At the power ON of the Bridge is immediately connected to the QNet network, if the ratings are valid (simulates I2 on). 3 = At the power ON of the Bridgee is immediately connected to the QNet network (simulates I1 and I2 on).
fn_i01	number	0	**Input 1 function**: 0 = Abilitazione alla connessione (default). Stato: Continuo. Con l'ingresso alto, vengono abilitate le operazioni di connessione. Con l'ingresso basso, vengono chiuse eventuali connessioni in essere ed inibite le successive (anche WAKE-UP).
fn_i02	number	0	**Input 2 function**: 0 = Enable/Disable connection (default). State: Impulsive. Minimum duration of command: 1 sec. The activation of the input will cause the network connect/disconnect procedure to the QNet network. If FunctionI1 is 0, the input issubject to the consent of I1 (active).
fn_o01	number	0	**Output 1 function**: 0 = Ready connect (default). Output OFF: if I1 is OFF or the start up conditions are not valid. Steady output: if I1 is in ON and if all start up conditions are valid (SIM ok, network presence, etc...).
fn_o02	number	0	**Output 2 function**: 0 = Connection state (default). Output OFF: Connection is not present or in progress. Steady output: Connected to the QNet network.