QE-BR-ETH485

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CONTENTS

SAFETY WARNINGS AND CAUTIONS

The following warnings and cautions must be observed to ensure personal safety and prevent damage.

Death or **serious injury** may result from failure to heed this warning.

Material damage or **serious personal injury** may result from failure to heed this warning.

The manufacturer **declines all responsibility** for electrical safety in the event of improper use of the equipment.

It is essential to read the entire contents of this manual before carrying out any work.

Installation and commissioning must be carried out by qualified personnel only.

Before commissioning, make sure that:

- the maximum values for all connections are not exceeded; refer to the product data sheet;
- the connection cables are not damaged or live during wiring;
- the direction of current flow and phase rotation are correct.

During installation, ensure that a switch or circuit-breaker is near the product and easily accessible.

The unit must be uninstalled if safe operation can no longer be guaranteed (e.g. visible damage). Disconnect all connections in this case. The unit should be returned to the manufacturer or to an authorised service centre for repair.

WARNING: High-intensity magnetic fields may alter the values measured by the transformer. Avoid installation near: permanent magnets, electromagnets, or iron masses. If irregularities are detected, reposition or move the unit to a more suitable location.

Failure to observe the warnings may result in damage to the equipment or failure to operate as intended.

Please note that the information on the nameplate must be observed.

It is necessary to comply with national regulations when installing and picking materials for power lines.

Repairs and modifications must be carried out only by the manufacturer. It is forbidden to open the case and make any changes to the device. Tampering with the device will invalidate the warranty.

The product described in this document may only be used for the specified application. The maximum performance data and environmental conditions specified in the product data sheet must be observed. Proper transport and storage, as well as professional assembly, installation, handling and maintenance are required for the correct and safe operation of the device.

Use under ambient conditions other than those specified, application of signals or voltages other than those specified, may cause significant deviations from the specified measurement tolerances, which may be irreversible.

Although the contents of this document have been checked for accuracy, it may contain errors or inconsistencies and we cannot guarantee its completeness or accuracy.

This document is subject to periodic revision and updating. QEED reserves the right to make changes to the product and/or its technical documentation at any time in the interests of continuous quality improvement. Always consult the latest version of the documentation available on the website:

www.qeed.it

If you find any errors or missing information in this document, please notify us by e-mail to:

technical@qeed.it

Disposal of waste electrical and electronic equipment (applicable in the European Union and other countries with separate collection). The symbol on the product or its packaging indicates that the product should not be treated as household waste. Instead, it will be handed over to an authorised collection point for the recycling of electrical and electronic waste. Ensuring that the product is disposed of properly will prevent potential negative effects on the environment and human health, which could otherwise be caused by inappropriate waste management of the product. Recycling materials helps to conserve natural resources. For further information, please contact your local authority, waste disposal service or the retailer from whom you purchased the product.

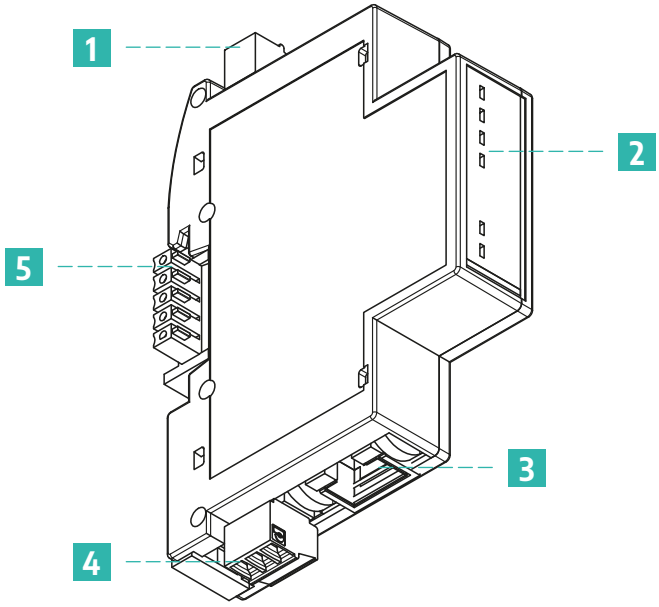
PRODUCT OVERVIEW

The QE-BR-ETH485 is a Modbus TCP (10/100 Ethernet server) to Modbus RTU (RS485 master) converter capable of extending the reach of networks and facilitating the transfer of process data between different levels of IT and industrial communication architecture. It accepts up to 10 clients and has an integrated WEB server page for configuring the various communication parameters.

All inputs/outputs are designed with 1500V isolation between RS485 terminals, power supply and Ethernet port.

There are 6 interface LEDs on the front for visual feedback on TCP and RTU operation and communication.

Designed for DIN rail mounting, it is T-BUS ready for fast connection without wiring.



1. Power supply terminals
2. Status LEDs
3. Ethernet port
4. RS485 Modbus RTU terminals
5. T-BUS terminal for both power supply and Modbus RTU communication (optional)

TECHNICAL SPECIFICATIONS

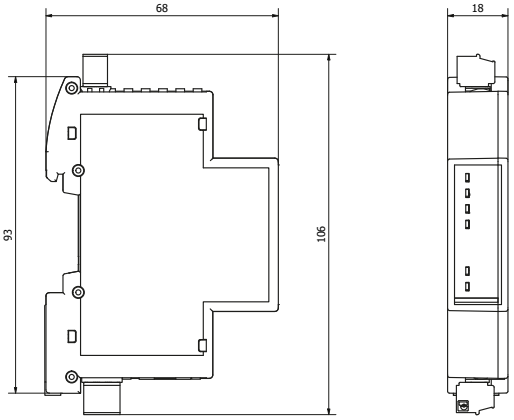
Electrical characteristics

Power supply	10÷40 VDC or 20÷28 VAC @50/60Hz
Current consumption	150mA max
Isolation	RS485 serial interface, USB interface and power supply are galvanically isolated from each other at 1.5 kV
Communication interface	Ethernet 10/100 RS485 Modbus RTU
Visual interface	Status LEDs

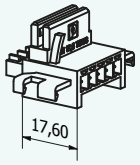
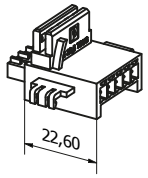
Communication characteristics

Modbus RTU	Baudrate	1200÷115200 bps
	Addresses	1÷247 (default 1)
	Data format	8 bits dati, parità NO/ODD/EVEN, bit stop 1 o 2
	Answer delay	1÷1000ms
	Connection	Tramite morsetto estraibile o T-BUS (opzionale)
	Default configuration	115200, 8, N, 1
Ethernet	Port	Lateral RJ45
	Speed	10/100 Mbps
	Number of slaves	MAX 247
	Number of clients	MAX 10
	Default configuration	Static IP address 192.168.178.29 Subnet 255.255.255.0 Gateway 192.168.178.1

General data

Working temperature	-15÷60° C
Storage temperature	-40÷85° C
Relative humidity	10÷90% not condensing
Elevation	Up to 2000m a.s.l.
Protection degree	IP20
Measurements	106x68x18 mm 
Weight	54 g
Terminal cable cross-section	0.05÷1.5 mm² (30÷14 AWG)
Approvals and certifications	EN61000-6-4/2006 + A1 2011; EN64000-6-2/2005; EN61010-1/2010 CE UKCA
Installation	Inside electrical panels and mounted on a DIN rail

Order Codes

Product	QE-BR-ETH485
Product without logo	QE-BR-ETH485-T-NL
T-BUS	QA-TBUS-17,5 width 17,6mm 
	QA-TBUS-22 width 22,6mm 

CONNECTION AND INSTALLATION

The instrument is designed to be installed inside electrical panels and mounted on a DIN rail, with or without the aid of the T-BUS connector for interfacing multiple instruments with reduced cabling.

The functionality of the terminals is described below:

9 AC 10 AC ≂	Device power supply. **Please note**: Wiring must be protected against short circuits and/or accidental faults
GND 18 B- 19 A+ 20	RS485 Modbus RTU connection: terminals 32 (GND), 33 (B-), 34 (A+)
AC AC ≂ GND B- A+	T-BUS connection (requires optional T-BUS accessory): the T-BUS accessory can be fitted to the module base to provide both power supply and serial communication (see figure below). The number of modules supported by the bus depends on the power supply used (please check the power consumption of the modules)
ETH PORT	Ethernet Port

Figure 1: DIN-rail installation with T-BUS

RS485 bus termination

To avoid unbalances on the transmission bus, it is advisable to insert a termination resistor at the beginning of the RS-485 bus (typically on the USB-RS485 adapter) and at the end (typically on the last slave - which can also be activated by dip-switch). It is advisable to use 120Ω resistors with 1% tolerance, which corresponds to the typical impedance of RS485 cables.

The following images are for illustrative purposes only:

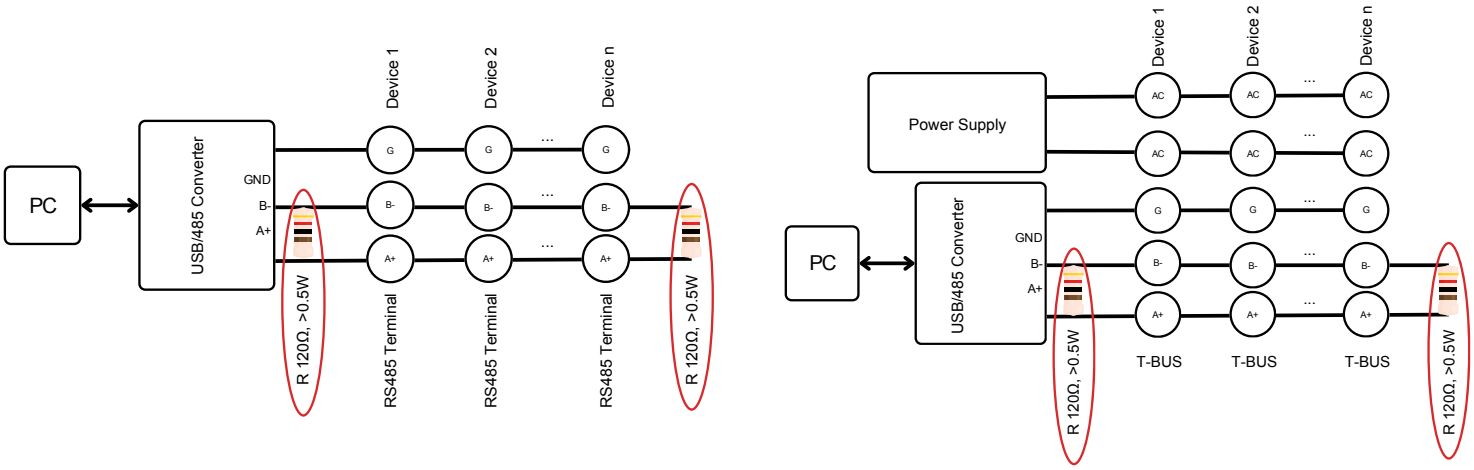


Figure 2: Figura 2: RS485 dynamic bus termination

STATUS LEDS

Function	Status	Meaning
Power (green)	ON	Powered device
Fail (yellow)	Quick flashing	Ethernet communication active (or bootloader enabled, see DIP switches)
	Slow flashing	Awaiting Ethernet communication
RX (red)	Flashing	The system is receiving data from the RS485
TX (red)	Flashing	The system is transmitting data on the RS485
Link (yellow)	ON	Ethernet network connection
ACT (yellow)	Flashing	Activity on the Ethernet network

DEVICE CONFIGURATION

DIP-Switch configuration

Using the DIP switches accessible through the hole in the product casing (see Figure 3 for illustration), the communication parameters of the module can be set as shown in the table:

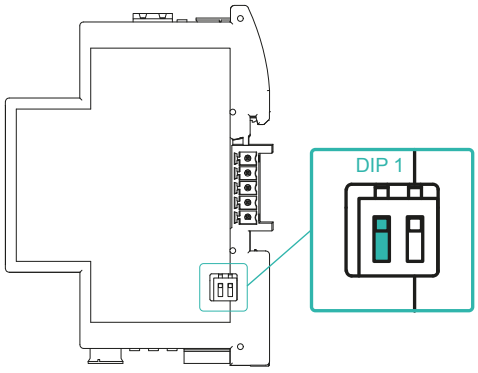


Figura 3: Dip switch for baud rate configuration

DIP1	DIP2	DESCRIPTION
OFF	OFF	Communication parameters from FLASH
ON	OFF	Default communication parameters (192.168.178.29; 115200,8, N,1)
OFF	ON	DHCP Enabled

Interfacing with the device

The QE-BR-ETH485 is designed to interface in Ethernet to serial configuration as an Ethernet server and Modbus RTU master (e.g. Modbus Poll).

In this structure, a Modbus TCP-IP client is connected via Ethernet to the QE-BR-ETH485 gateway, which has one or more Modbus RTU slaves (such as our QA-OMNI, QE-POWER-T, QI-POWER-485, etc.) connected to its RS485 serial port. An example representation could be:

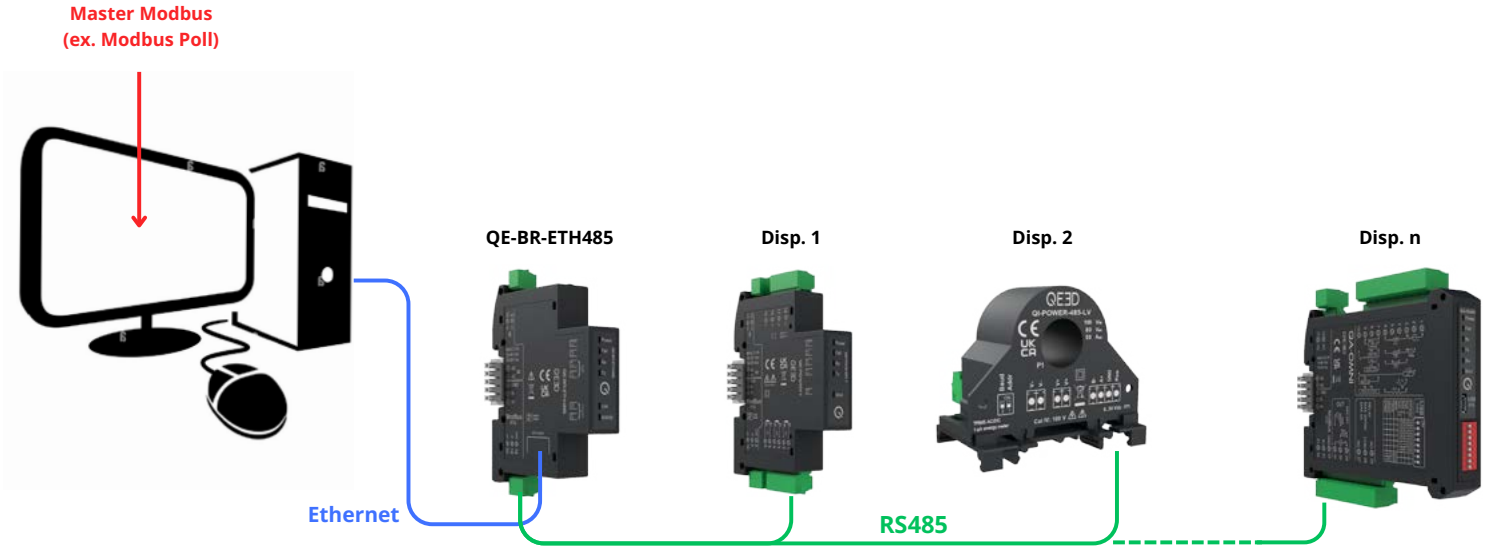


Figure 4: QE-BR-ETH485 connection

The QE-BR-ETH485 requires configuration of the Ethernet and serial network settings (baud rate, parity, etc.). Each slave device connected to the RS485 Modbus network must be configured with a different address and have the same Modbus RTU communication settings selected for the QE-BR-ETH485.

It is not necessary to specify the registers to be polled, since the conversion from Ethernet to serial is done in real time and transparently. The Modbus TCP client requests the read/write of a ModBUS register via Ethernet, the gateway converts the request to the serial slaves to Modbus RTU and the Modbus RTU response from the interrogated slave is then converted to the Modbus TCP client.

It is possible to interface with the QE-BR-ETH485 in 2 different ways:

- With DHCP enabled
- With default configuration

By setting DIP switches DIP1 ON - DIP 2 OFF (default configuration), it is necessary to be on the same network as the QE-BR-ETH485. If it does not already exist, a network with the same structure as the static IP of the device must be created.

This can be done by adjusting the network settings of your PC. An example is given below for illustrative purposes only:

Figure 5: Network IP settings

The factory default configuration for the Ethernet port is as shown in the data sheet:

- Static IP address 192.168.178.29
- Subnet 255.255.255.0
- Gateway 192.168.178.1

PLEASE NOTE: Before connecting the unit to the Ethernet network, make sure that the IP address 192.168.178.29 is not being used by another Ethernet device!

Do not connect more than one device with the same IP address to the same network.

By setting DIP switches DIP1 OFF - DIP 2 ON (DHCP enabled), the router to which the QE-BR-ETH485 is connected will automatically assign an IP to the product. To find out which IP is assigned, it is necessary to use a search tool for devices connected to the network (e.g. **https://www.advanced-ip-scanner.com/it/**). Once the network scan has started, find the product labelled HTTP, Bridge and note the IP given.

You can now access the QE-BR-ETH485 via the web server.

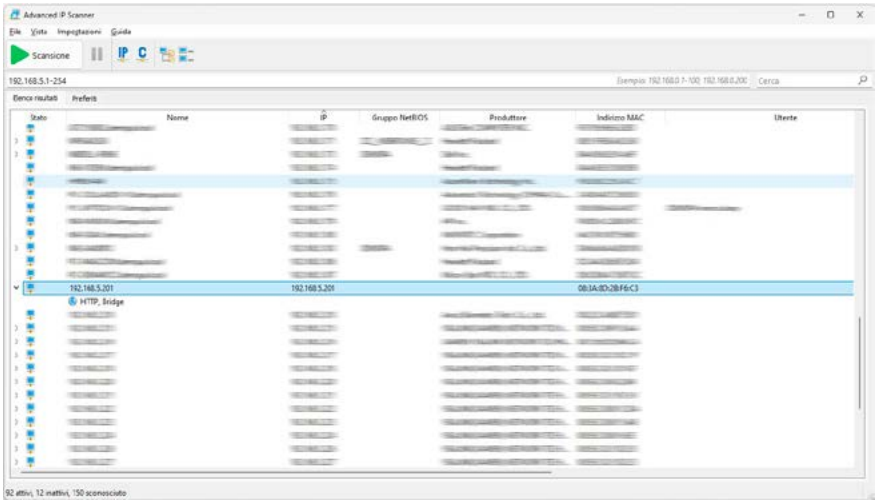


Figure 6: Advanced IP Scanner

WEB SERVER

The QE-BR-ETH485 includes a web server for real time configuration and display of parameters.

To access the web pages, enter the IP address of the unit in a browser (default IP 192.168.178.29 or the IP assigned by DHCP).

From the web server, it is possible to act on the configuration parameters of the serial port (Fig. 7), the Ethernet port (Fig. 8), to update the QE-BR-ETH485 firmware in case of new releases (Fig. 9) and to obtain product information (Fig. 10).

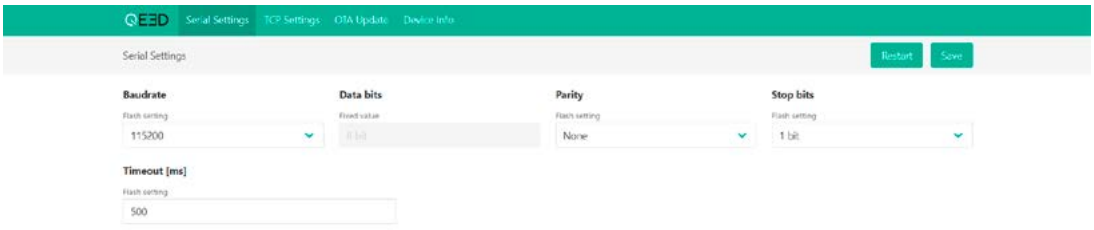


Figure 7: Modbus RTU settings page

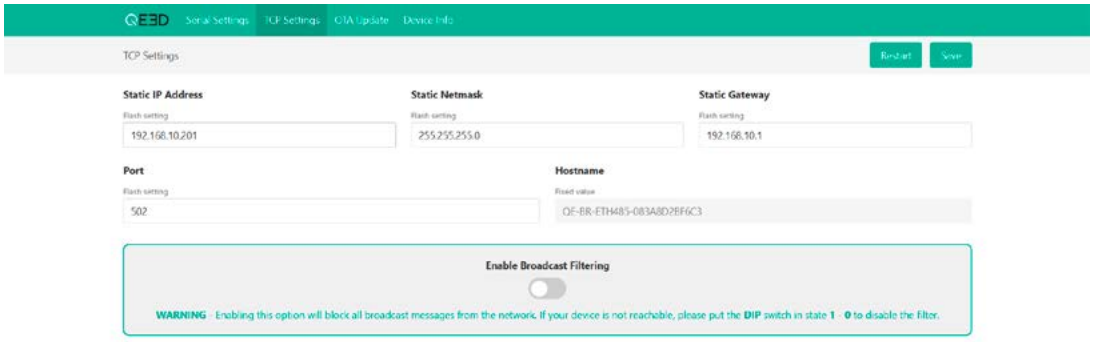


Figure 8: TCP settings page

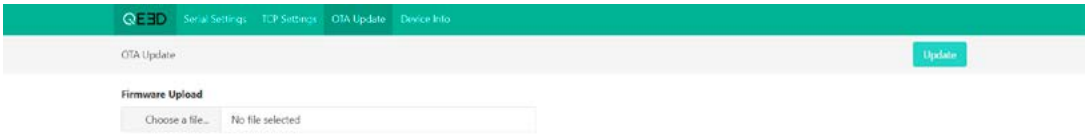


Figure 9: FW update page

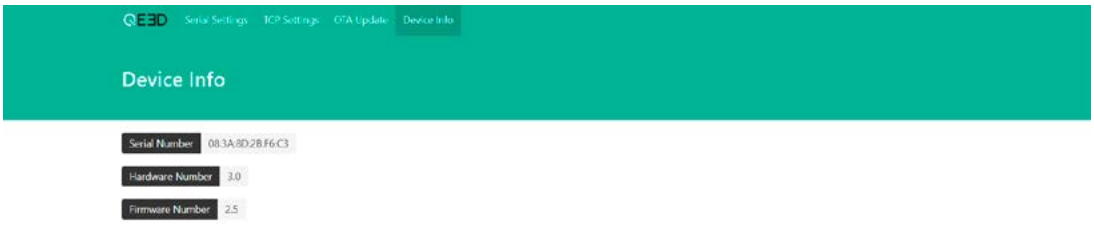


Figure 10: Device info page

BROADCASTING FILTER

In some networks that are particularly prone to broadcast transmissions, the QE-BR-ETH485 may, after a certain period of time depending on the traffic exchanged, experience communication difficulties and stop working.

To solve this problem, set up 'Broadcast filtering' using the appropriate button on the TCP settings page (Figure 2).

It should be noted that once this filter has been activated, the product may no longer be detectable by the discovery tools, so if the IP address of the device is no longer known in order to connect, it will be necessary to use the default settings (DIP switch DIP1 ON - DIP 2 OFF), remove the filter, reposition the DIP switch DIP1 OFF - DIP 2 ON  (DHCP enabled) and search for the device again.

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As standards, specifications, and design change from time to time, please ask for confirmation of the information given in this publication.