QEED
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I/O DIGITAL INTERFACE - 8 INPUT
RS485 MODBUS Slave

QE-8DI

MADE IN ITALY CE

I/O Digital Modbus Slave Interface, **USB configurable**, DIN rail mounting, **3-way galvanically isolated**, universal power supply AC/DC, **n°8 DIGITAL INPUT.**

POWER SUPPLY	10..40 Vdc, 19-28 Vac, 50-60 Hz
OUTPUT	n°1 RS485 Modbus Slave
ABSORPTION	Maximum 1 VA
PROTECTION INDEX	IP 20
WORKING TEMPERATURE	-15…+65°C
STORAGE TEMPERATURE	-40°C… +85°C
ISOLATION	3 way: Digital inputs, serial output RS485 and Power supply, are galvanically isolated at 1,5 kV
HUMIDITY	10...90% not condensing
ALTITUDE	Up to 2000 m s.l.m.
MOUNTING	DIN rail mounting with removable terminals, RS485 bus and Supply connection ready on the base of module (connector not included, on request)
CONNECTIONS	Removable terminals 3,5 mm
CE STANDARDS	EN61000-6-4/2006 + A1 2011; EN64000-6-2/2005; EN61010-1/2010
DIMENSIONS	17,5 x 93 x 68 mm (terminals excluded)
CONFIGURATION	By free software FACILE QE-8DI to configure all of the conversion parameters via USB port or via RS485. Dip-switch for setting default baudrate
HOT SWAPPING	The module QE-8DI has HOT SWAPPING technology, this enables the module to be inserted and removed from the system without the need to restart the device Modbus Master connected to it

DIGITAL INPUTS:

DIGITAL INPUTS: n°8.
TYPES: PNP with common negative, n°8 counter/totalizer inputs at 32 bit, max frequency 10 kHz.
Output 5 Vdc for detecting the presence of optomos contacts.

SERIAL COMMUNICATION:

- RS485 Modbus Slave;
- Bus connection on the base of module by adapter (option) or on terminals. Dip-switch for setting address and baudrate;
- Configuration over USB.

N°8 DIGITAL INPUTS:

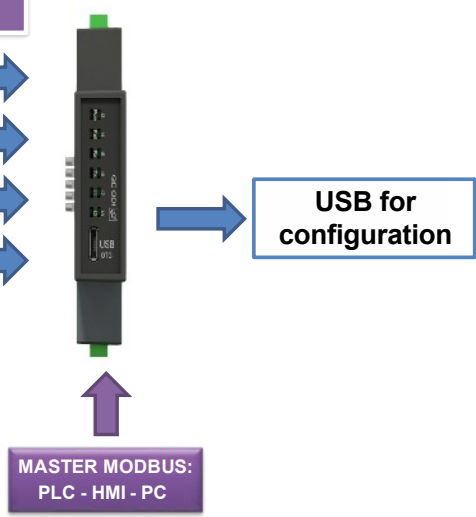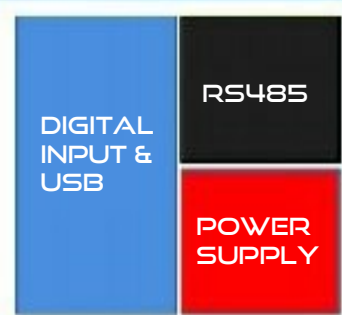**All the inputs could be Totalizer or free contact**

USB for configuration

MASTER MODBUS: PLC - HMI - PC

**3-WAY GALVANIC ISOLATION**

DIGITAL INPUT & USB

RS485

POWER SUPPLY

QE-8DI

I/O DIGITAL INTERFACE - 8 INPUT
RS485 MODBUS Slave

DESCRIPTION:

The QE-8DI is a slave module with n°8 digital inputs. Thanks to the presence of the RS485 serial port it can perform advanced functions such as I/O module with Modbus RTU protocol. The QE-8DI behaves as slave device providing an output at 5 V for the detection of Optomos contact. It also accept 24 Vdc as digital input.

ELECTRICAL CONNECTIONS:
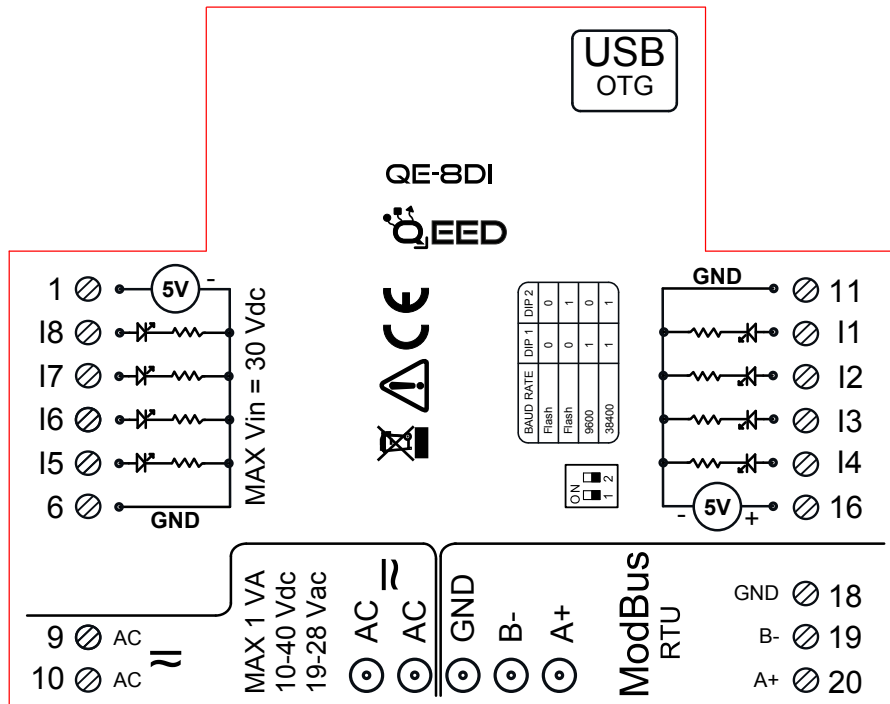
POWER SUPPLY:

10...40 Vdc or 20...28 Vac - Connectors 9 and 10, or by T-BUS connector (optional tool) on the base of the module.

DIGITAL INPUTS:

the QE-8DI accepts the input pulses up to 10 kHz, from mechanical contact, REED, 24 V, PNP.

SERIAL OUTPUT RS485:

available on connectors 18 (GND), 19 (B-), 20 (A+), or by T-BUS connector to be mounted on the module.

T-BUS CONNECTION (OPTION), needs T-BUS connector:

serial communication and power supply can be taken on the T-Bus. The female connector for the T-Bus is 5-way with pitch 3,81 mm.

PROGRAMMING THE DEVICE BY SOFTWARE   QE-8DI

Programming of the module QE-8DI may be performed in two different ways:

- via the free interface program FACILE QE-8DI through the micro USB port on the module or via RS485 connection;
- by connecting a PLC with RS485 serial connection (from terminals or T-Bus).

it is possible to configure the module by connecting it to the USB port of your PC without powering, this is possible because the QE-8DI is equipped with a microprocessor that manages the configuration and it is powered directly from the USB port.

To use the program FACILE QE-8DI, go on our website www.qeed.it in the PRODUCTS page, on the right menu, click on DOWNLOAD SOFTWARE and then click FACILE QE-8DI, you can install the program on your PC. Once downloaded, install it in the desired directory and run the program.
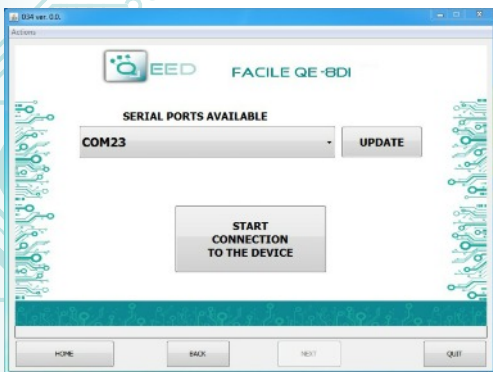
It is possible to use the program without connecting to the module, in this mode you can SAVE the configuration on your PC, which can then be sent to the QE-8DI later.

SERIAL PORTS AVAILABLE:

check the available COM ports, press the UPDATE button. Your PC will assign a virtual COM connection with the QE-8DI. Press START CONNECTION TO THE DEVICE. It will confirm you the connection was successful with the module. If the connection does not happen, please check the RS485 serial connection (A +, B-), the position of the dip-switches (switching off and on the device) and the COM generated automatically by the device.
After connecting, you can proceed with the configuration of the device.
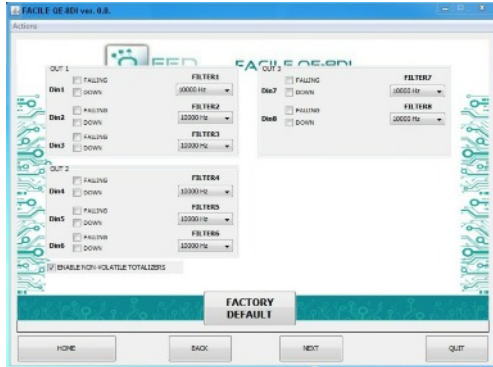
QE-8DI

PROGRAMMING THE DEVICE BY SOFTWARE

FALLING:
you can enable the function " FALLING " with the selection of the relative box to the corresponding digital input (for the default the count is "rising").

FILTER:
you can select n°6 filter levels to set the sampling rate (to filter any bounces of contacts).

DOWN:
selecting this field, the count is enabled on backwards (default is forward).

ENABLE NON-VOLATILE TOTALIZERS:
enabling this field, the totalizers are maintained even when turned off (non-volatile memory).

MODBUS COMMUNICATION:

This is the last window of the device configuration. The left column contains the parameters to be set for the communication speed BAUDRATE (from 1200 to 115200), the PARITY (None, Odd, Even), the STOP BIT (1 or 2), the Modbus address to be assigned to the device.
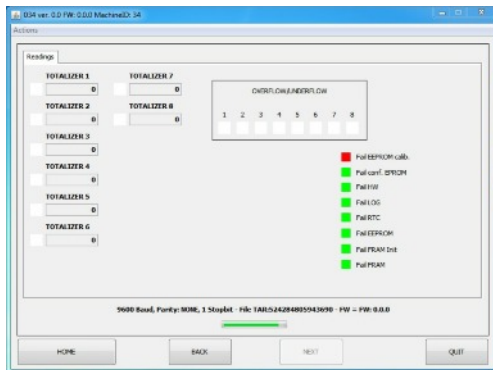
TOTALIZER:
shows the number of counts for the respective digital input (n° maximum of counting up to 2^{32}). It's possible to insert a value of arbitrary start.
The laterals "flag status digital input" indicate whether the corresponding digital input is active.

OVERFLOW / UNDREFLOW:
When one of the totalizers reaches the maximum allowed, the indicator turns YELLOW.

LED FAIL:
shows any malfunctions of the device.

MODBUS REGISTER MAP — QE-8DI

REMARKS:
- Modbus connections: A+ and B-;
- Modbus Register reference: with reference to the logical address, for ex. 40010, corresponds to physical address n°9 as per Modbus RTU standard;
- Modbus functions supported: 3 (Read multiple registers), 6 (Write single), 16 (Write Multiple Holding Registers).

Register Name	Comment	Register Type	R/W	Default Value	Modbus Address
Machine Id	Machine ID	unsigned short	R	34	40001
Firmware Version	Firmware version	unsigned short	R	X	40002
Status	bit[0]=fail eeprom calibration; bit[1]=fail eeprom configuration; bit[2] = fail hw; bit[3]=fail log; bit[4]=fail rtc, bit[5]=fail eeprom; bit[6] fail fram	unsigned short	R	0	40003
Digital input	(bit 0 = din1 ... bit 7 = din8)	unsigned short	R		40004
Dip	DIPSW status : bit 0-1=dip switch status	unsigned short	R		40006
Overflow	Overflow/Underflow bit 0 tot1, ... , bit 7 tot8	unsigned short	R/W	0	40012
Totalizer din 1	Totalizer 1	unsigned long	R/W	0	40015 40016
Totalizer din 2	Totalizer 2	unsigned long	R/W	0	40017 40018
Totalizer din 3	Totalizer 3	unsigned long	R/W	0	40019 40020
Totalizer din 4	Totalizer 4	unsigned long	R/W	0	40021 40022
Totalizer din 5	Totalizer 5	unsigned long	R/W	0	40023 40024
Totalizer din 6	Totalizer 6	unsigned long	R/W	0	40025 40026
Totalizer din 7	Totalizer 7	unsigned long	R/W	0	40027 40028
Totalizer din 8	Totalizer 8	unsigned long	R/W	0 / 0	40029 40030
Totalizer mode	: bit 0 falling/rising tot1, ..., bit 7 falling/rising tot8	unsigned short	R/W	0	40079
Filter din 1	Number of samples for the filter (every 41us)	unsigned short	R/W	1	40080
Filter din 2	Number of samples for the filter (every 41us)	unsigned short	R/W	1	40081
Filter din 3	Number of samples for the filter (every 41us)	unsigned short	R/W	1	40082
Filter din 4	Number of samples for the filter (every 41us)	unsigned short	R/W	1	40083
Filter din 5	Number of samples for the filter (every 41us)	unsigned short	R/W	1	40084
Filter din 6	Number of samples for the filter (every 41us)	unsigned short	R/W	1	40085
Filter din 7	Number of samples for the filter (every 41us)	unsigned short	R/W	1	40086
Filter din 8	Number of samples for the filter (every 41us)	unsigned short	R/W	1	40087
Up down mode	: bit 0 up/down tot1, ..., bit 7 up/down tot8	unsigned short	R/W	0	40092
Non-volatile memory	:bit14=1 vale FRAM per count	unsigned short	R/W	0	40093
Modbus addr parity stopbits	: MSB = address (1); LSB = bit[1-0] parity = none/odd/even; bit[2] =stopbit ½	unsigned short	R/W	256	40094
Modbus baudrate	: value 0=1200,1=2400,2=4800,3=9600,4=19200,5=38400,6=57 600,7=115200	unsigned short	R/W	5	40095
Command	SAVE_TARAT = 0XC1B0; SAVE_SETT = 0XC1C0; READ DIP = D166; RESET = C1A0;	unsigned short	R/W	0	40121
Command param 2		unsigned short	R/W	0	40123
uid_l	Calibration file name	unsigned short	R/W		40124
uid_m	Calibration file name	unsigned short	R/W		40125
uid_h	Calibration file name	unsigned short	R/W		40126
HW version	Hardware version	unsigned short	R/W		40127

FIRMWARE Upgrade

The QE-8DI can upgrade the firmware via the USB port using a standard pen drive where the new file will be placed.

The firmware will allow you to implement new functionalities and correct any anomalies that may occur. In order to upgrade the firmware simply, remove power from the module, insert the pen drive with the file, restore power. The new firmware will be uploaded without altering the configuration loaded during programming. During the update phase the LED FAIL light will be blinking.

MODBUS BAUD RATE CONFIGURATION BY DIP-SWITCH

Through the two way dip-switch on the side of the module, you can change the baud rate for default communication.
In case all the dip switches are set to zero, the module will take the communication settings from EEPROM, otherwise it will take parameters from the dip-switch.

DIP 1	DIP 2	BAUD RATE
0	0	Flash
0	1	Flash
1	0	9600
1	1	38400

In order to assign addresses different from 1 (the default one), you need to take advantage of the interface software FACILE QE-8DI.

POWER SUPPLY by TERMINALS:
10...40 Vdc or 10...28 Vac - Connectors 9 and 10.

POWER SUPPLY by T-BUS CONNECTION (T-BUS connector required):
it is possible to mount the accessory T-BUS to carry both power and serial communication. The number of modules supported by the function of the power supply bus is used (check the absorption of the modules).

INTERFACE PROGRAM FACILE QE-8DI
FACILE QE-8DI is the configuration software for QE-8DI module.
The software is free and downloadable from the website: www.qeed.it/category/software.
To communicate with the module you have to connect via USB port directly on your PC.
It is possible to configure the module via RS485

LEDS - FRONT SIGNALS:

Power: power presence on the device.
Fail: presence of a failure/error on the device. It is activated in the case have been activated by FAIL messages on FACILE QE-8DI. One or more events FAIL are active.
Rx, Tx: the module is communicating via RS485 (LED blinking).
I1...I8: digital input active.

MOUNTING INSTRUCTIONS:

To mount the QE-8DI on DIN rail, we recommend to place the top of the form on the edge of the omega bar, then pushing the bottom until it clicks. The module is equipped with a slider fastening that will be pushed forward in order to ensure the perfect fastening of the module on the bar.