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## INSTRUCTION MANUAL — QA-8DO

**DESCRIPTION:**

The QA-8DO is a slave module with n°8 relays output. Thanks to the presence of the RS485 serial port can perform advanced functions such as I/O module with Modbus RTU protocol.

**QA-8DO**

**INSTRUCTION MANUAL**

## ELECTRICAL CONNECTIONS

| | |
|---|---|
| 16 AC MAX 2,5 VA 10-40 Vdc | **POWER SUPPLY:** |
| 17 AC 20-28 Vac | 10...40 Vdc or 20...28 Vac - Connectors 16 and 17, or by T-BUS connector (optional tool) on the base of the module. |

| Left terminals | Right terminals | DIGITAL OUTPUT: |
|---|---|---|
| 1 NC | NO 18 | n°8 relays SPDT 5 A / 250 Vac. |
| 2 COM RELAY MAX 250Vac MAX 5A | COM 19 RELAY MAX 250Vac MAX 5A | RL1 - O1: digital output n°1. |
| 3 NO RL4 - O4 | NC 20 RL8 - O8 | RL2 - O2: digital output n°2. |
| 4 NC | NO 21 | RL3 - O3: digital output n°3. |
| 5 COM RELAY MAX 250Vac MAX 5A | COM 22 RELAY MAX 250Vac MAX 5A | RL4 - O4: digital output n°4. |
| 6 NO RL3 - O3 | NC 23 RL7 - O7 | RL5 - O5: digital output n°5. |
| 7 NC | NO 24 | RL6 - O6: digital output n°6. |
| 8 COM RELAY MAX 250Vac MAX 5A | COM 25 RELAY MAX 250Vac MAX 5A | RL7 - O7: digital output n°7. |
| 9 NO RL2 - O2 | NC 26 RL6 - O6 | RL8 - O8: digital output n°8. |
| 10 NC | NO 27 | |
| 11 COM RELAY MAX 250Vac MAX 5A | COM 28 RELAY MAX 250Vac MAX 5A | |
| 12 NO RL1 - O1 | NC 29 RL5 - O5 | |

| | |
|---|---|
| ModBus RTU GND 32 B- 33 A+ 34 | **SERIAL OUTPUT RS485:** available on connectors 32 (GND), 33 (B-), 34 (A+), or by T-BUS connector to be mounted on the module. |
| AC AC GND B- A+ | **T-BUS CONNECTION** (OPTION), needs T-BUS connector: it may be affixed to the accessory T-BUS based on the module to bring both power and serial communication. The number of modules supported by the bus is a function of the power supply used (check the absorption of the modules). |

# PROGRAMMING THE DEVICE BY SOFTWARE          QA-8DO

The programming of the module QA-8DO may be performed in two different ways:

- via the interface program free FACILE QA-8DO through the micro USB port on the module or via RS485 connection;
- via the RS485 serial connection (from terminal or T-Bus).

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

To use the program FACILE QA-8DO, go on our website www.qeed.it in the PRODUCTS page, on the right menu, click on DOWNLOAD SOFTWARE and then click FACILE QA-8DO, 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 QA-8DO at a later time.

**SERIAL PORTS AVAILABLE:**

check the available COM ports, press the UPDATE button. Your PC will assign a virtual COM connection with the QA-8DO. Press START CONNECTION WITH 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.

**CONFIGURATION:**
by selecting the first two boxes on this page you can load the parameters "FROM FILE " and "FROM DEVICE".
To run a new configuration starting from the default settings, click on "NEW CONFIGURATION FROM DEFAULT PARAMETERS".
By clicking the last box, there will be shown the "REAL TIME" measures performed by the device.

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## PROGRAMMING THE DEVICE BY SOFTWARE    QA-8DO

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**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.

**FACTORY DEFAULT:**
by clicking on this box, all settings return to the default value.



**D-OUT INIT-STATE:**
selecting the respective box, the state from normally open (NO) switch to a normally closed (NC).

**ENEABLE NON-VOLATILE D-OUT:** enabling this field, the outputs state is stored in nonvolatile memory. At power up, the outputs will take this state.

**TIME OUT:** enabling the time out (0 - disabled), the device show the outputs to the initial condition when the communication with the "master" module is interrupted.

**FACTORY DEFAULT:**
by clicking on this box, all settings return to the default value.
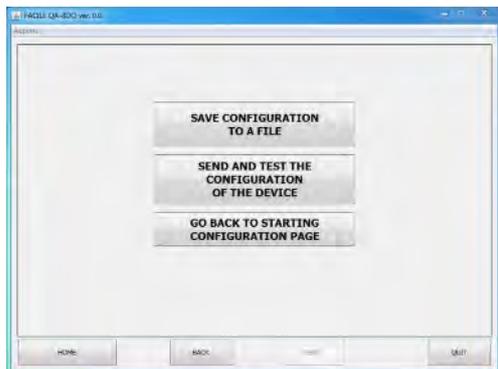


The picture on the right show the last page of the software FACILE QA-8DO. By clicking on the first box you can save the configuration to a file. By clicking on the box in the middle of the page you can send (to QA-8DO) and test the configuration. By clicking on the last box you can return to the configuration page.

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# MODBUS REGISTER MAP            QA-8DO

**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).

| Register Name | Comment | Register Type | R/W | Default Value | Modbus Address |
|---|---|---|---|---|---|
| machine_id | Machine ID | unsigned short | R | 27 | 40001 |
| fw_ver | Firmware version | unsigned short | R | xxx | 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_init; bit[7]=fail fram | unsigned short | R | 0 | 40003 |
| digital_output_eff | (bit 0 = dout1 ... bit 7 = dout8) real output state | unsigned short | R |  | 40005 |
| dip | DIPSW status : bit 0-7=dip switch status | unsigned short | R |  | 40006 |
| digital_output_imp | (bit 0 = dout1 ... bit 7 = dout8) | unsigned short | R/W |  | 40011 |
| timeout_comm | timeout [sec*10], after wich output are switched to dout_init_state. (0= disabled) | unsigned short | R/W | 0 | 40079 |
| dout_init_state | : bit 0 dout1 ... bit 7 dout8; bit14=1 enable timeout; bit15=1 enable FRAM for DOUT | unsigned short | R/W | 0 | 40093 |
| modbus_addr_parity_stopbits | : MSB = address (1); LSB = bit[1-0] parity = none/odd/even; bit[2] =stopbit 1 or 2 | unsigned short | R/W | 256 | 40094 |
| modbus_baudrate | : value 0=1200,1=2400,2=4800,3=9600,4=19200,5=38400, 6=57600,7=115200 | unsigned short | R/W | 3 | 40095 |
| command | SAVE_TARAT = 0XC1B0; SAVE_SETT = 0XC1C0; LEGGIDIP = D166; RESET = C1A0 | unsigned short | R/W | 0 | 40121 |
| 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 |

## Upgrade FIRMWARE

The QA-8DO is designed to upgrade the firmware via the USB port using a standard pen drive where the file will be placed. The firmware will allow you to implement the functionality of the card 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, at this point the card will automatically discharge the file and update the firmware without altering the configuration loaded during programming. During the update phase the LED light will be intermittent FAIL.

QA-8DO

MODBUS REGISTER MAP