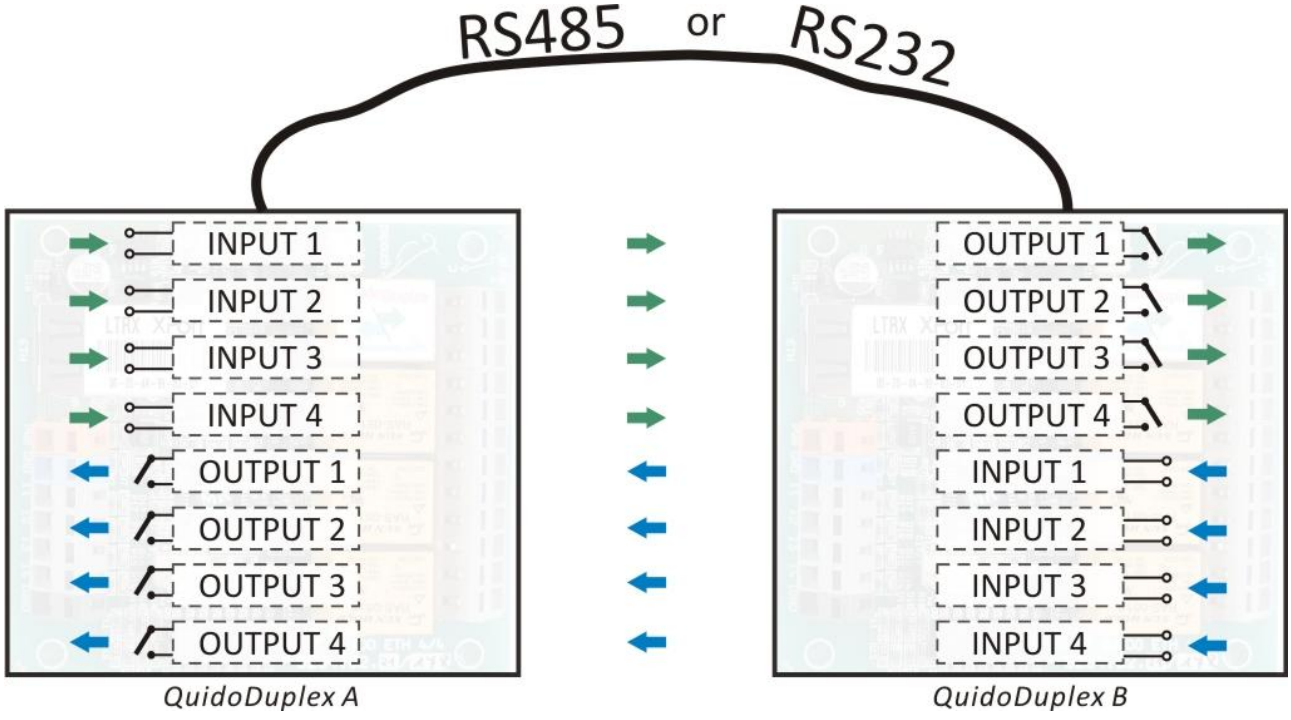
QuidoDuplex RS

Set for bi-directional transmission of 4 or 8 two-state signals over RS485 or RS232



QuidoDuplex RS

Datasheet

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CONTENT

BASIC INFORMATION

Description

The QuidoDuplex RS set enables the synchronisation of two I/O modules interconnected via an RS485 or RS232 line. Activating the input of one module switches on the relay in the second module and vice versa.

This way it is possible to transmit the status of 4 or 8 contacts or other two-state signals over the distance of up to 1200 metres (even more if using repeaters) via the two conductors of the RS485 line.

See the example shown in the figure on the front page of this document (it shows the transmission of four signals).

Application

- Bi-directional transmission of four or eight two-state signals (e.g. the status of a contact) via two conductors only (if using the RS485 line).
- Transmission of the operational state of various devices over large distances (device status indication for the operator).
- Using only two conductors to transmit information about the status of contacts to the other side of the plant. The same conductors may be used in the opposite direction to send commands to control the lifting barrier, gate, light, etc.
- Easy remote control of machines – bi-directional transmission may be used for monitoring as well as the control.

Block diagram

The status of Input 1 in Module A is transmitted to Output 1 in Module B and vice versa. Thus the status of all signals is transmitted bi-directionally.

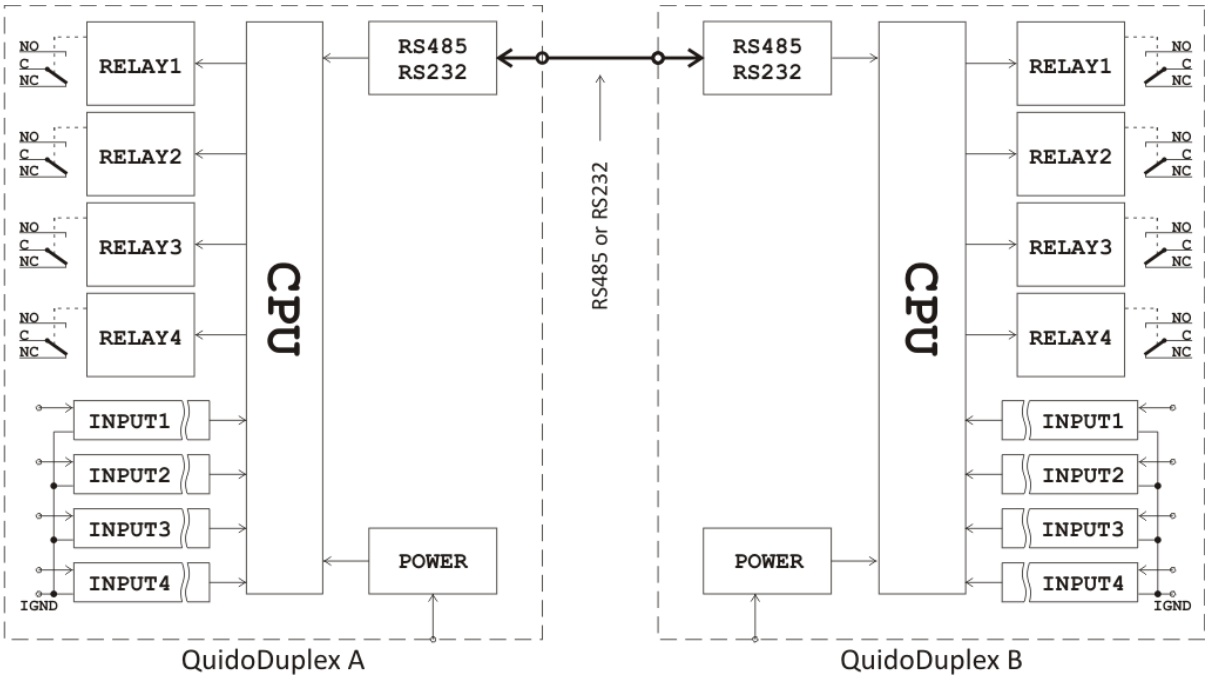


Fig. 1 – block diagram

First connection

1) Connect the input and output terminals. The options for input and output terminal connection are described in chapter *Connection of input and output terminals* on page 6.

Tip: The delivered Quido set includes a plastic lever enabling easy connection of conductors. The lever is to be used as illustrated in the figure below.[1]

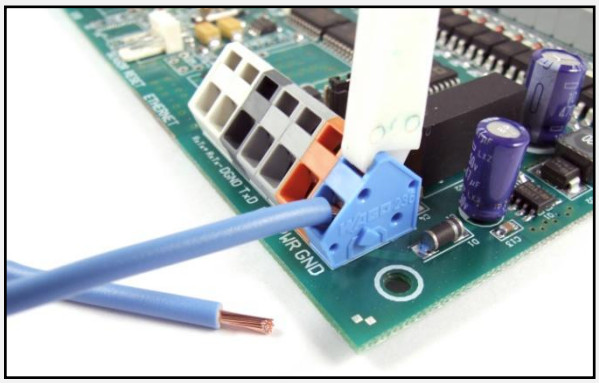


Fig. 2 – lever used for easy connection of conductors

2) Interconnect the two modules using the wires of the data cable.

   RS485 connection: two wires. Interconnect the RxTx+ terminals using one conducting wire and the RxTx- terminals using the other wire. Please note the following recommendations:

Some basic recommendations for connecting the RS485 line:

- It is recommended to use a standard TP cable for computer networks (UTP, FTP or STP) and to use one twisted pair from this cable as conducting wires for RS485.
- Termination must be connected in both modules (close to the RS485 terminals).
- Cable shielding is to be connected on one side only!

   RS232 connection: three wires. Interconnect the GND terminals of both modules, connect the RxD of one module to the TxD of the other module and vice versa. (Typical cross connection.)

3) Connect direct-current supply voltage within the range of 8 to 30 V to the PWR (+ orange) and GND terminals. Quido is equipped with integrated protection against polarity reversal of supply voltage. When power supply is connected, the PWR indicator lights up.

4) The connection is completed and the set is ready for operation.

[1] It is also possible to use a small flat-tip screwdriver.

[2] The values of resistors may vary depending on the version purchased.

[3] An example of connection used for higher voltages can be found on the next page.

Operation

After being switched on, the modules synchronize with each other within approx. two seconds. If there are any connection problems, the modules periodically try to initiate communication until they manage to establish it.

In case there is a failure of connection for longer than 5 seconds, both modules open the output relay.

The delay in the transmission of signals between the modules is approx.1 to 2 seconds.

Simple indication of lost connection

The established connection can be tested in a simple way in case that the system does not use all transmission signals.

Make a permanent activation of one of the unused inputs in one module. This causes permanent activation of one relay in the second module. Its contacts, which are open as long as communication is established, can be connected to a light bulb, a buzzer etc. If the connection is lost, the module disconnects all contacts after five seconds including the relay connected to the indicator of lost connection. Thus the indication bulb switches on, the buzzer sounds etc.

CONNECTION OF INPUT AND OUTPUT TERMINALS

Inputs

The inputs can be controlled by connecting voltage or a contact.

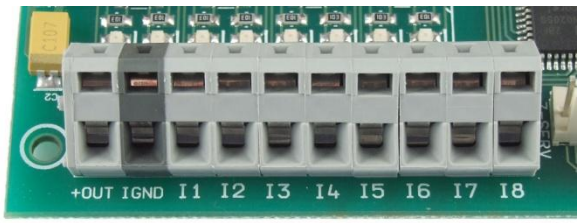


Fig. 3 – input terminal box of QuidoDuplex RS 8/8

Each input is connected as shown in Fig. 4. IGND grounding is galvanically isolated from the GND of the device.

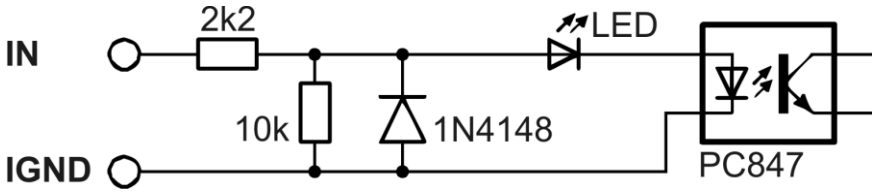


Fig. 4 – input circuit connection **2**

[2] The values of resistors may vary depending on the version purchased.

Contact input

An example of contact connection is shown in Fig. 5.

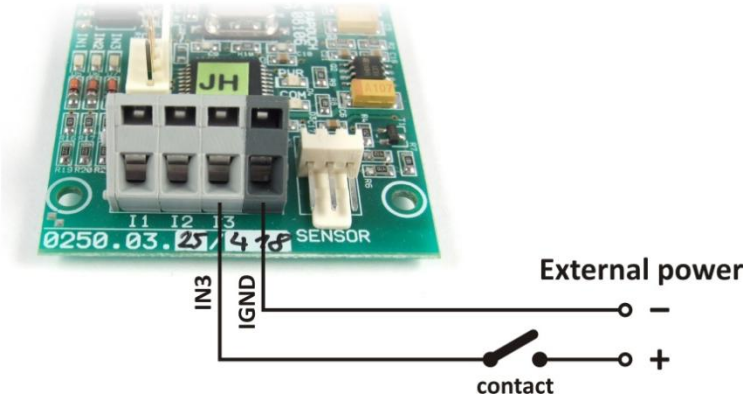


Fig. 5 – contact input

Note: If the contacts are connected using an external source, the inputs are galvanically isolated. If the external source is also used for Quido, the galvanic isolation is disabled and the inputs are galvanically connected to Quido via the grounding of the source.

Voltage input

Voltage input connection is shown in the following figure.

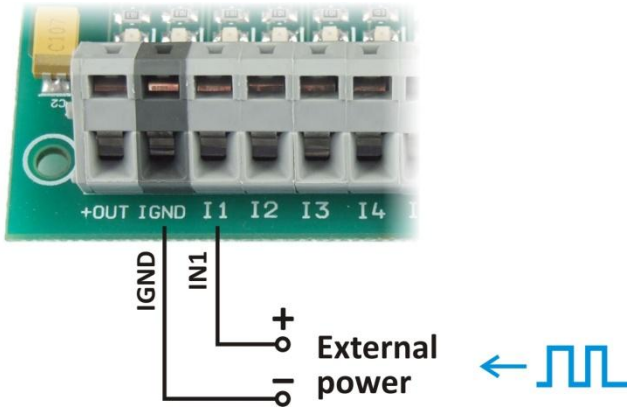


Fig. 6 – voltage input (e.g. for connecting a pulse output)

Outputs

Each output is equipped with a relay with a make-and-break contact (max. 60 V AC or 85 V DC! [3]).

Fig. 7 – make-and-break contacts of output relays

[3] An example of connection used for higher voltages can be found on the next page.

In idle state the output is connected as illustrated:

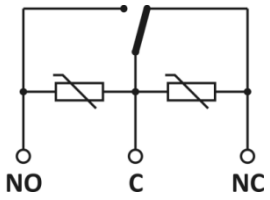


Fig. 8 – relay contact connection including varistors

Example of output connection used for higher voltages (e.g. 230 V)

For higher voltages of e.g. 230 V the Quido outputs need to be reinforced by an external relay or a contactor.[4] An example of connection is shown in the figure and diagram below.

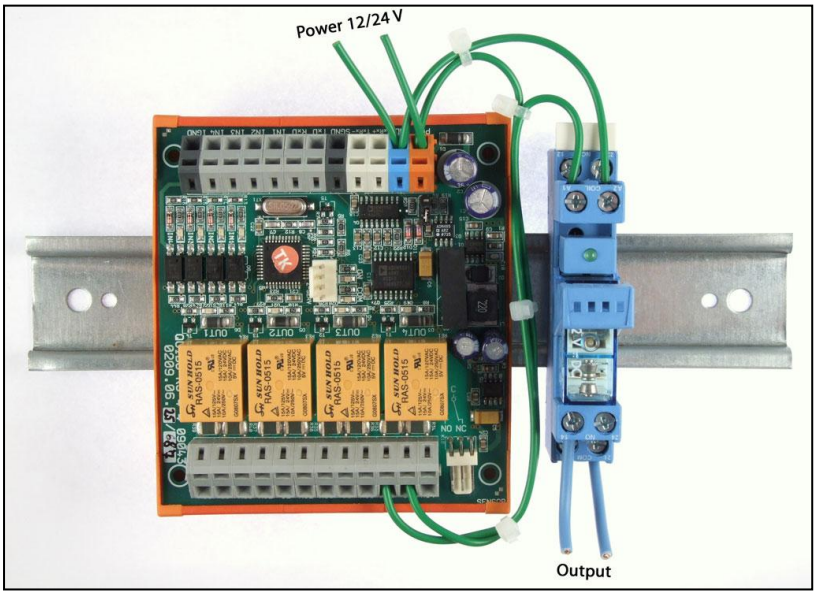


Fig. 9 – example of Quido connection for 230 V AC

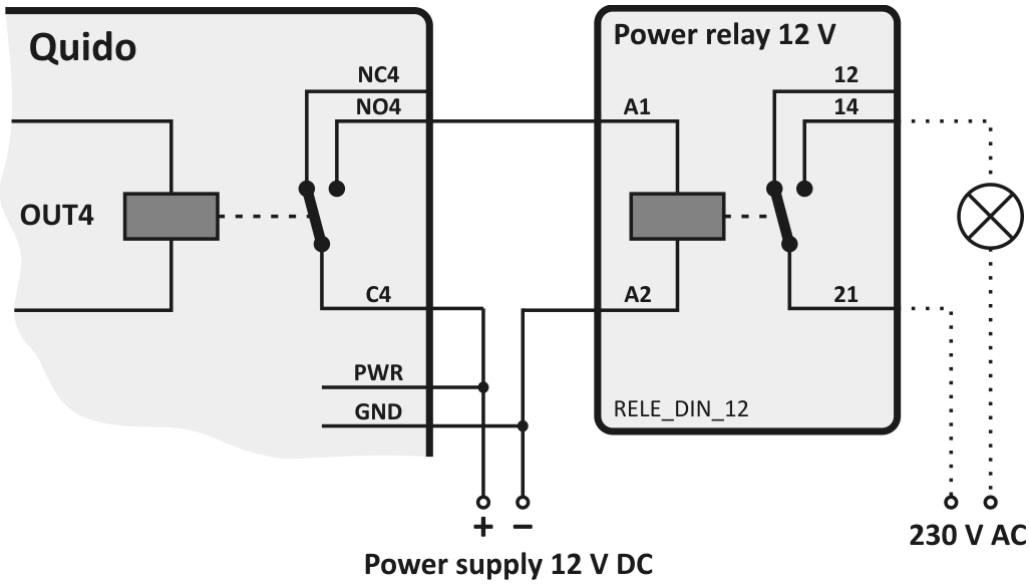


Fig. 10 – block diagram of the connection shown in Fig. 9 and an example of switching a 230 V bulb

[4] Power realy for up to 300 V AC, illustrated in the figure, can be ordered using the following codes RELE_DIN_5 (for 5 V supply), RELE_DIN_12 (for 12 V), RELE_DIN_24 (for 24 V), RELE_DIN_48 (for 48 V).

TECHNICAL PARAMETERS

Inputs

No of digital inputs .....4 or 8 depending on the version

Input type .....for the connection of voltage or a switching contact

Galvanic separation .....optical

Rate of response to change in level ..10 to 20 ms[5]

VERSION I.[6]:

Input voltage for status „1“.....4.5 – 10 V

Input voltage for status „0“.....0 – 2.5 V

Input current at 5 V.....typ. 3.2 mA

Input current at 9 V.....typ. 8.9 mA

Maximum input voltage .....10.0 V

VERSION II.[6]:

Input voltage for status „1“.....7 – 28 V

Input voltage for status „0“.....0 – 3 V

Input current at 12 V.....typ. 3.5 mA

Input current at 24 V.....typ. 7.8 mA

Maximum input voltage .....28 V

Outputs

No of digital outputs.....4 or 8 depending on the version

Type.....make-and-break relay contact

Maximum switching voltage.....alternating: 60 V, direct-current 85 V

Maximum switching current .....5 A

Varistor .....U_{AC} = 60 V; E_{MAX} = 5 J; C = 0.64 nF

Control interface

Type.....RS232 and RS485

Protection against polarity reversal.....6.5 V transient voltage suppression diodes in RS485 and 12 V in RS232

Communication speed.....9600 Bd

Number of data bits 8

[5] If this sampling interval is not suitable for your application we will be happy to modify it.

[6] Version II is supplied as standard. (inputs for voltages 9 to 28 V).

Parity ..... no parity

Number of stop-bits 1

Communication protocol ..... Spinel

A (Master) module configuration

Address ..... "1" (default setting)

Automatic sending of input states ..... activated (default setting)

B (Slave) module configuration

Address ..... other than "1" (default setting)

Connectors

(power supply connectors, inputs, outputs, RS232, RS485.)

Type ..... Wago 236 terminal block

Conductor cross-section ..... 0.08 to 2.5 mm^2

Length of conductor isolation ..... 5 to 6 mm

Conductor/electronic board angle ..... 45°

Spacing between terminals ..... 5.08 mm

Conductor clamping ..... Wago CAGE CLAMP®[7]

Other parameters

Power supply ..... 8 to 30 V DC

Protection against polarity reversal ..... yes, diode in series connection

Operating temperature ..... -20 °C to +70 °C

Mounting holes – diameter ..... 3.2 mm

	No relay ON [mA]			**All relays ON** [mA]		
	8 V	**12 V**	**24 V**	**8 V**	**12 V**	**24 V**
Quido RS 4/4	41	29	17	27	173	90
Quido RS 8/8	57	41	23	424	283	148

Tab. 1 – typical current consumption by Quido RS by I/O modules

	Weight [g]
Quido RS 4/4	100 g
Quido RS 8/8	176 g

Tab. 2 – Weight of Quido RS I/O modules (electronics boards only without fixtures)

[7] The set is supplied including a plastic lever enabling easy connection of conductors. It is also possible to use a small flat-tip screwdriver.

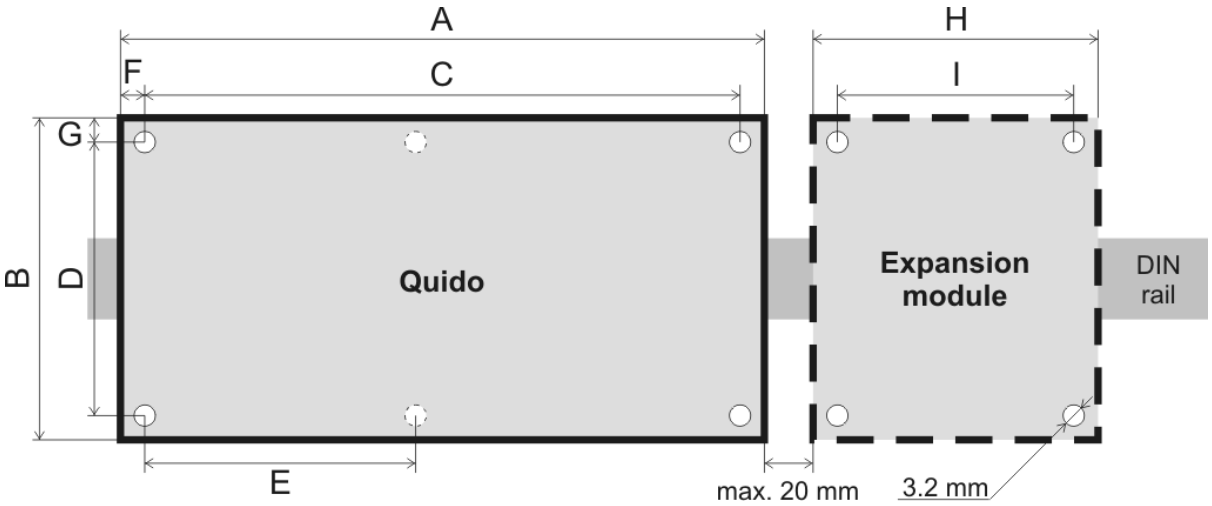


Fig. 11 – Dimensions (specific values can be found in the table below)

	A	B	C	D	E	F	G	H	I	Height
Quido RS 4/4	86.7	96.5	77.8	80		4.4	8.3			20
Quido RS 8/8	137.4	96.5	128.9	80		4.4	8.3			20

Tab. 3 – Dimensions in millimetres (electronics boards without fixtures)

Available designs

Cover and assembly:

- Electronics board only *(standard design)*

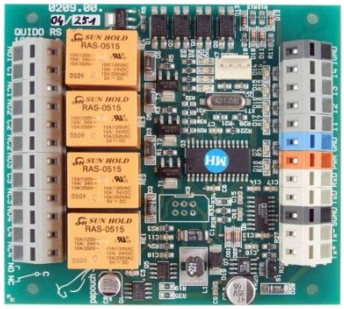
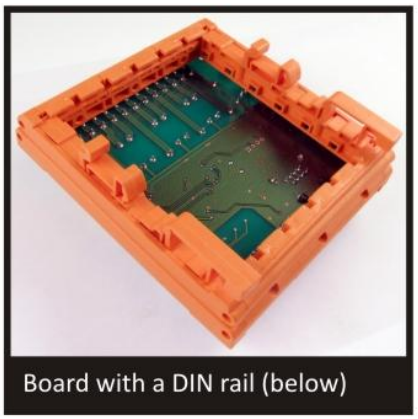
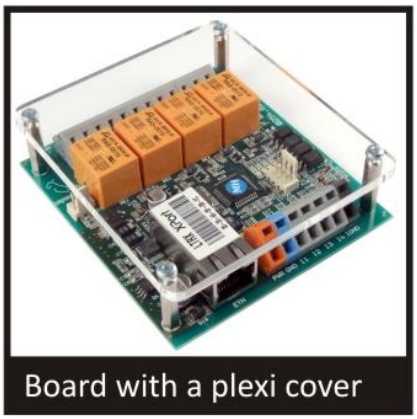


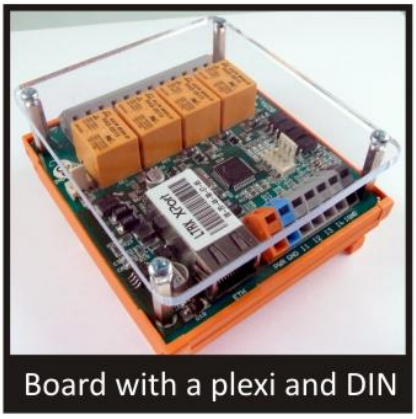
Fig. 12 – example of standard design

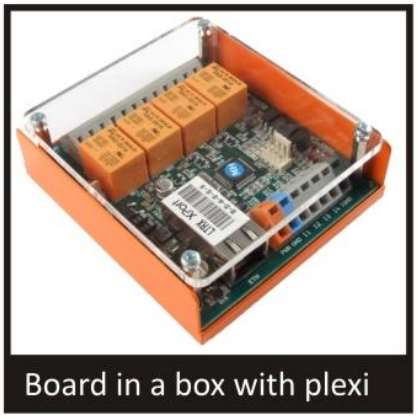
- All assembly options are illustrated below (here Quido ETH 4/4):


Board with a DIN rail


Board with a DIN rail (below)


Board with a plexi cover

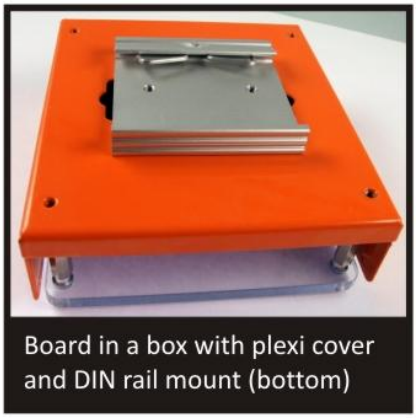

Board with a plexi and DIN


Board in a box with plexi


Board in a box


Board in a box (below)


Board in a box with DIN (below)


Board in a box with plexi cover and DIN rail mount (bottom)

Examples of functions which can be added upon request:

- More modules connected in synchronous operation.
- Change in input voltage levels.
- … and other customised functions to suit your application.

Do not hesitate to contact us in case of any other requirements concerning the design and functions of the QuidoDuplex module.

Available accessories

Switched power supply unit 12V

Switched power supply unit 230 V/12 V DC, socket adapter design.

Power supply unit 230 V/12 V mountable to DIN

Linear power supply unit 230 V/12 V DC mountable to DIN rail.

Lever for Wago 236 terminals

A tool enabling easy connection of wires to Wago 236 terminals.

Fig. 13 – lever for Wago 236

Papouch s.r.o.

Data transmission in industry, line and protocol conversions, RS232/485/422/USB/Ethernet/GPRS/ WiFi, measurement modules, intelligent temperature sensors, I/O modules, and custom-made electronic applications.

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