

OI16 Optocoupler board

Connect digital signals. Galvanically isolated.

The optocoupler card OI16 is ideal to electrically isolate digital signals for optimum protection of the data acquisition and control system.

16 optocoupler inputs. 16 optocoupler outputs.

16 optocouplers on the OI16 convert digital inputs in the voltage range of 7..35V into TTL signals. The 16 optocoupler outputs of the OI16 controlled by TTL signals of the PC data acquisition system feature output high-side drivers for voltages in the range of 7..35V.

Get connected.

The digital inputs and outputs of the application-specific hardware (sensor, machine, etc.) are connected at a 37-pole D-Sub female. A 25-pole D-Sub male and alternatively two 20-pole pin connectors serve for the connection to the DAQ and control system.

Well supplied.

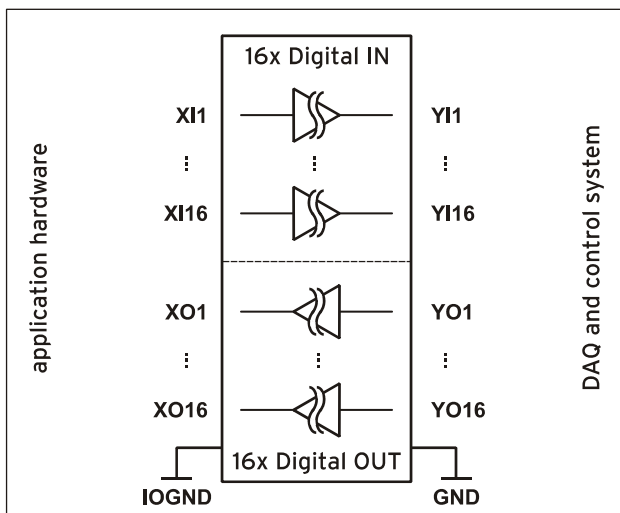
The OI16 is operated with 7..35V. The supply voltage is connected via screw-clamp terminals or at the D-Sub 37 female.

DIN rail mounting.

The optocoupler card is suitable for DIN rail mounting. A DIN rail carrier with bracket is already included with the delivery of the OI16.

Compatibility.

Particularly simple is the connection to the digital I/O interface USB-PIO as only a 25-pole D-Sub extension cable is needed for connecting.



Functional diagram

1 Connections and pin assignments

The available connections and components of the OI16 are shown in the following figure of the board (view on top of the board (fitted with components), D-Sub 37 connector on the left).

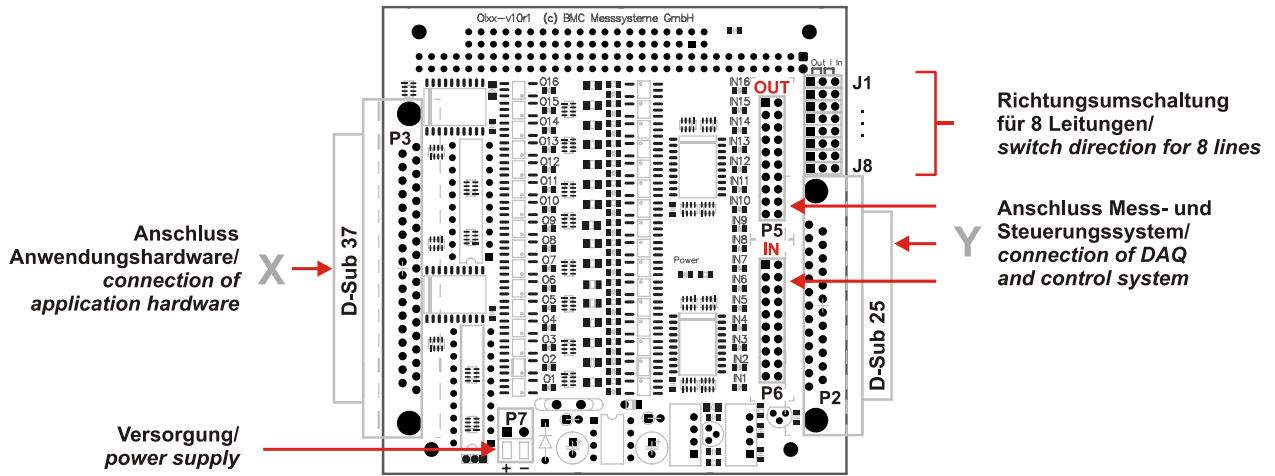


















Figure 1

The OI16 allows for the connection of up to 16 digital inputs and 16 digital outputs. Those are electrically isolated from the PC data acquisition and control system. The table shows the assignment of the connectors for the respective application hardware and the DAQ system (factory setting of the jumpers marked in red):

Digital I/O (application hardware)	Pin D-Sub 37	Pin D-Sub 25	20-pole pin connector "IN"/"OUT" / Pin	Digital I/O (DAQ system)
XI1	11	1	IN / 1	YI1
XI2	30	14	IN / 2	YI2
XI3	12	2	IN / 3	YI3
XI4	31	15	IN / 4	YI4
XI5	13	3	IN / 5	YI5
XI6	32	16	IN / 6	YI6
XI7	12	4	IN / 7	YI7
XI8	33	17	IN / 8	YI8
XI9	15	9 (with J1: 2-3 )	IN / 9	YI9
XI10	34	22 (with J2: 2-3 )	IN / 10	YI10
XI11	16	10 (with J3: 2-3 )	IN / 11	YI11
XI12	35	23 (with J4: 2-3 )	IN / 12	YI12
XI13	17	11 (with J5: 2-3 )	IN / 13	YI13
XI14	36	24 (with J6: 2-3 )	IN / 14	YI14
XI15	18	12 (with J7: 2-3 )	IN / 15	YI15
XI16	37	25 (with J8: 2-3 )	IN / 16	YI16
XO1	1	5	OUT / 1	YO1
XO2	20	18	OUT / 2	YO2
XO3	2	6	OUT / 3	YO3
XO4	21	19	OUT / 4	YO4
XO5	3	7	OUT / 5	YO5
XO6	22	20	OUT / 6	YO6
XO7	4	8	OUT / 7	YO7
XO8	23	21	OUT / 8	YO8
XO9	5	9 (with J1: 1-2 )	OUT / 9	YO9
XO10	24	22 (with J2: 1-2 )	OUT / 10	YO10
XO11	6	10 (with J3: 1-2 )	OUT / 11	YO11
XO12	25	23 (with J4: 1-2 )	OUT / 12	YO12
XO13	7	11 (with J5: 1-2 )	OUT / 13	YO13
XO14	26	24 (with J6: 1-2 )	OUT / 14	YO14
XO15	8	12 (with J7: 1-2 )	OUT / 15	YO15
XO16	27	25 (with J8: 1-2 )	OUT / 16	YO16

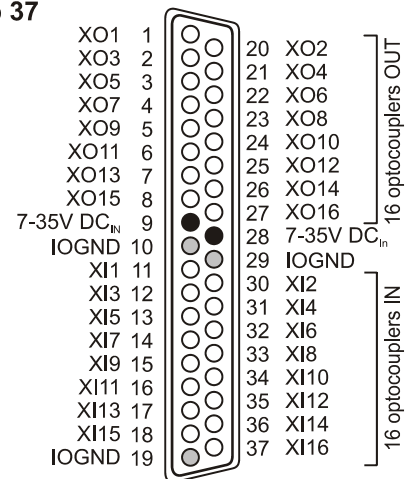
1.1 Connection to the application hardware

The digital lines of application-specific hardware are attached to the 37-pole D-Sub female (see Figure 1, p. 2) of the OI16.

Up to 16 digital inputs are provided for digital sensors or other digital signal sources at the connections XI1..XI16.

To control machines, switch a relay, etc., the 16 digital outputs XO1..XO16 can be used.

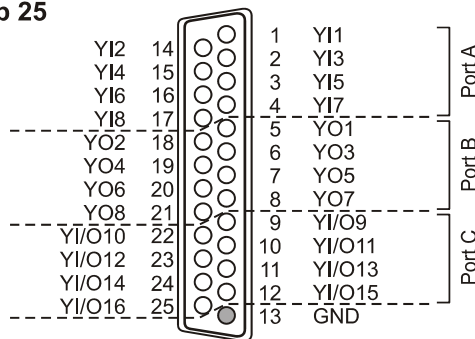
D-Sub 37



- IOGND = digitale Masse / digital ground
- 7-35V Versorgung / power supply

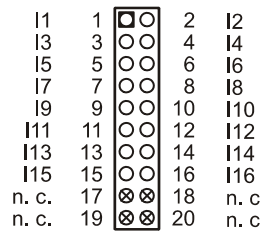
1.2 Connection to the DAQ and control system

D-Sub 25

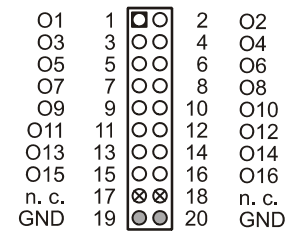


- GND = digitale Masse / digital ground

IN



OUT

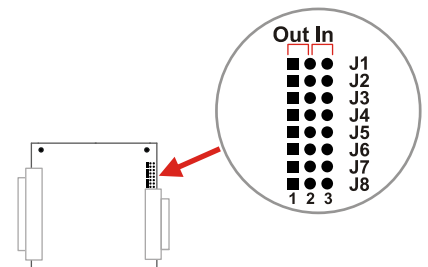


- ⊗ nicht angeschlossen / not connected

The DAQ and control system is connected at the 25-pole D-Sub male or at the two 20-pole pin connectors "IN"/"OUT" (see Figure 1, p. 2) on the OI16 board.

8 digital inputs (port A: YI1..YI8) and outputs (port B: YO1..YO8) each are hard-wired. Use jumpers J1..J8 to set another 8 lines (port C) to input (YI9..YI16: jumper to 2-3) or output (YO9..YO16: jumper to 1-2, factory setting).

If more than 24 digital lines are needed, the other channels are attached at pin 9..16 of the pin connectors "IN" (for YI9..YI16) or "OUT" (for YO9..YO16).



- Please carefully observe the polarity! Only apply voltages within the adjusted range!
- It is very important to set the port direction of the connected DAQ system correctly! Otherwise the outputs of the OI16 might drive against the outputs of the DAQ system.
- IOGND must never be connected to GND, as this would override the galvanic isolation!

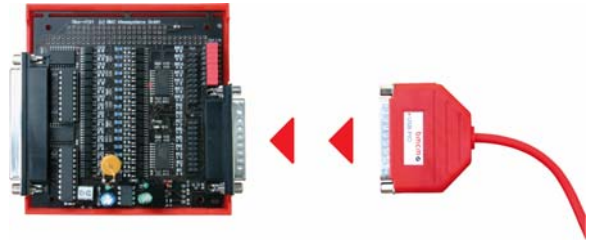
1.3 Power supply

The OI16 is supplied with 7..35V DC at the 2-pole screw-type terminal or at the D-Sub 37 female (see Figure 1, p. 2). The applied voltage is the switching voltage for the 16 digital outputs YO1..YO16 at the D-Sub 37 connector.



2 Application: Connect USB-PIO

Using the OI16 together with the digital DAQ system USB-PIO of bmcm is particularly easy. In this case the assignment is compatible. The connection is possible either directly or with a standard 25-pole D-Sub cable (ZUKA25 available as accessory).



Set the first eight lines (port A) of the USB-PIO to input and the next eight lines (port B) to output. Make sure that the direction of the remaining 8 digital lines (port C) corresponds to the jumper configuration of the OI16 (factory setting marked in red).

Digital lines	Port C (OI16)	Jumper J1-J8 (OI16)	Port C (USB-PIO)
8 IN / 16 OUT	Digital OUT YO9 - YO16	close 1-2	Digital OUT C0 - C7
16 IN / 8 OUT	Digital IN YI9 - YI16	close 2-3	Digital IN C0 - C7

3 Important notes for using the OI16

- The OI16 is only suitable for extra-low voltages – please observe the relevant regulations!
- An electrically isolated power unit (with CE) must be used for power supply.
- All accessible pins are electrostatic sensitive devices. Provide for an earthed conductive work place when installing.
- Only use non-solvent detergents for cleaning. The product is designed to be maintenance-free.
- The board must not be used for safety-relevant tasks. With the use of the product, the customer becomes manufacturer by law and is therefore fully responsible for the proper installation and use of the product. In the case of improper use and/or unauthorized interference, our warranty ceases and any warranty claim is excluded.



Do not dispose of the product in the domestic waste or at any waste collection places. It has to be either duly disposed according to the WEEE directive or can be returned to bmcm at your own expense.

4 Technical data

(typical at 20°C, after 5min., +5V supply)

• Digital inputs

Number:	16 optocoupler inputs
Input voltage range:	7..35V DC (>4.5V = high), max. 60V DC for 10sec.
Input current:	max. 10mA

• Digital outputs

Number:	16 optocoupler outputs with output high-side drivers
Switching voltage:	7..35V DC (corresponding to the supply voltage)
Voltage:	app. 1.5V
Switching current:	max. 0.25A per output, max. 0.8A in total per 8-bit port at 25°C

• General

Power supply:	7..35V DC, ±5%, own consumption max. 1W DC
Connection (application hardware):	37-pole D-Sub female
Connection (DAQ and control system):	25-pole D-Sub male or 2x 20-pole pin connectors
Bandwidth:	0..100Hz
Temperature range:	operating temp. 0..70°C, storage temp. -25..70°C
Relative humidity:	0..90% (not condensing)
CE standards:	EN61000-6-1, EN61000-6-3, EN61010-1; for decl. of conformity (PDF) visit www.bmcm.de
ElektroG // ear registration:	RoHS and WEEE compliant // WEEE Reg.-No. DE75472248
Max. perm. potentials (galv. isolation):	60V DC acc. to VDE, max. 1kV ESD on open lines
Dimensions (L x W x H):	app. 100mm x 100mm x 30mm
Available accessories (optional):	connecting cables ZUKA25, ZUKA37SB, ZUKA37SS, D-Sub plug ZU37ST, gender changer ZU37SS, waterproof housings ZU-PBOX-PG, ZU-PBOX-LAN
Warranty:	2 years from date of purchase at bmcm, claims for damages resulting from improper use excluded