OI16

Optocoupler Card

Connection of digital signals.
Galvanically isolated.

The optocoupler card OI16 is ideal for the electrical isolation of digital signals and for optimum protection of the data acquisition and control system.

16 optocoupler inputs.
16 semiconductor switches.

16 digital states in the 3..32V voltage range can be sampled and recorded. The 16 semiconductor switches of the OI16 are realized with high-side drivers for voltages in the 5..32V range and enable the direct connection of the power consumer up to 0,25A per connection (max. 0,8A per 8Bit port).

Well supplied.

The OI16 is operated through the 5V bmcm measurement system.

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 37-pole D-Sub male serves for the connection to the DAQ and control system.

Compatibility.

Particularly simple is the connection to the digital I/O interfaces PCI-PIO, PCI-Base II, PCIe-Base, LAN-AD16fx as only a 37-pole D-Sub extension cable is needed for connecting.
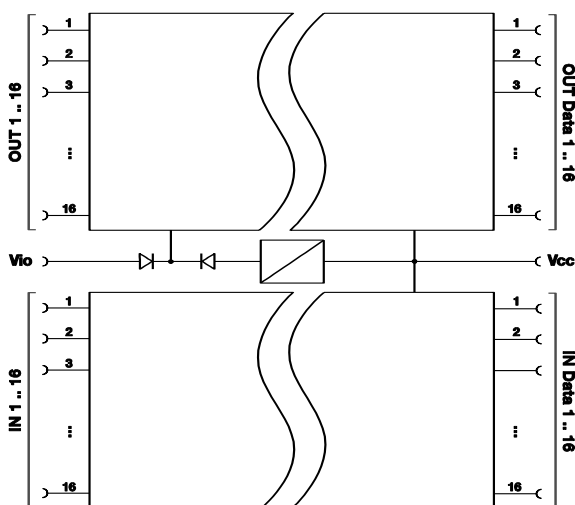
Funktionsschaltbild

1 Connections and pin assignment

The available connections and components of the USB-OI16 are shown in the following figure of the board (view on top of the board - fitted with components).
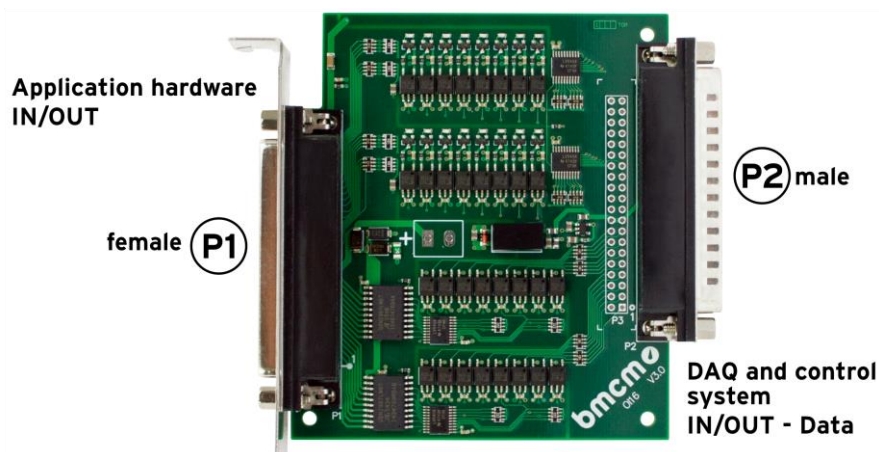
Figure 1

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.
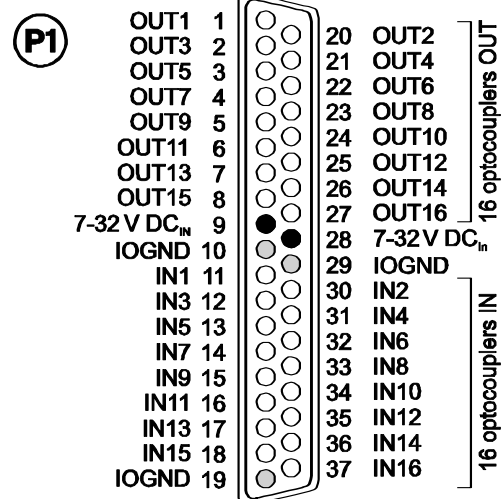Up to 16 digital inputs are provided for digital sensors or other digital signal sources at the connections IN1..IN16.
To control machines, switch a relay, etc., the 16 digital outputs OUT1..OUT16 can be used.
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The necessary power supply DCin for the outputs OUT1..OUT2 is connected at the PINs 9 + 28 with the matching earth PINs 10 + 29.
If NO external power supply is connected to the DCin, 5V are provided by the outputs of the measurement system.
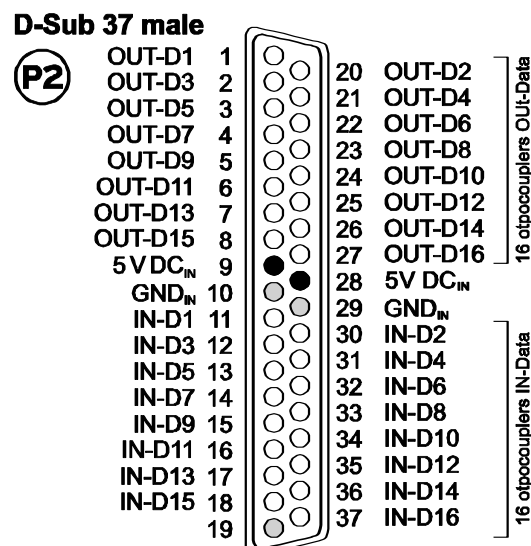
D-Sub 37 female

(P1)

Pin	Signal		Pin	Signal
1	OUT1		20	OUT2
2	OUT3		21	OUT4
3	OUT5		22	OUT6
4	OUT7		23	OUT8
5	OUT9		24	OUT10
6	OUT11		25	OUT12
7	OUT13		26	OUT14
8	OUT15		27	OUT16
9	7-32 V DC$_{In}$		28	7-32 V DC$_{In}$
10	IOGND		29	IOGND
11	IN1		30	IN2
12	IN3		31	IN4
13	IN5		32	IN6
14	IN7		33	IN8
15	IN9		34	IN10
16	IN11		35	IN12
17	IN13		36	IN14
18	IN15		37	IN16
19	IOGND			

16 optocouplers OUT

16 optocouplers IN

○ IOGND = digitale Masse / *digital ground*

● 7-32V Versorgung / *power supply*

1.2.   Connection to the DAQ and control system

The DAQ and control system is connected at the 37-pole D-Sub male P2 "IN/OUT Data" (see Figure 1, p. 2) on the OI16 board.
The controling of the output, respectively the input information of each line are put/read as TTL/CMOS.

D-Sub 37 male

(P2)

Pin	Signal		Pin	Signal
1	OUT-D1		20	OUT-D2
2	OUT-D3		21	OUT-D4
3	OUT-D5		22	OUT-D6
4	OUT-D7		23	OUT-D8
5	OUT-D9		24	OUT-D10
6	OUT-D11		25	OUT-D12
7	OUT-D13		26	OUT-D14
8	OUT-D15		27	OUT-D16
9	5 V DC$_{IN}$		28	5V DC$_{IN}$
10	GND$_{IN}$		29	GND$_{IN}$
11	IN-D1		30	IN-D2
12	IN-D3		31	IN-D4
13	IN-D5		32	IN-D6
14	IN-D7		33	IN-D8
15	IN-D9		34	IN-D10
16	IN-D11		35	IN-D12
17	IN-D13		36	IN-D14
18	IN-D15		37	IN-D16
19				

16 otpocouplers OUt-Data
16 otpocouplers IN-Data

○ GND$_{IN}$ = digitale Masse / *digital ground*

● 5V Versorgung / *power supply**

*from DAQ systems:
PCI-PIO, PCI-Base II, PCIe-Base, LAN-AD16fx

- **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!**

2   Usage and application

2.1   Connection of the DAQ system to OI16

The assignment of the plugs P2 perfectly match the digital connections of the bmcm DAQ systems:
PCI-BASEII
PCI-PIO
PCIe-BASE
LAN-AD16fx
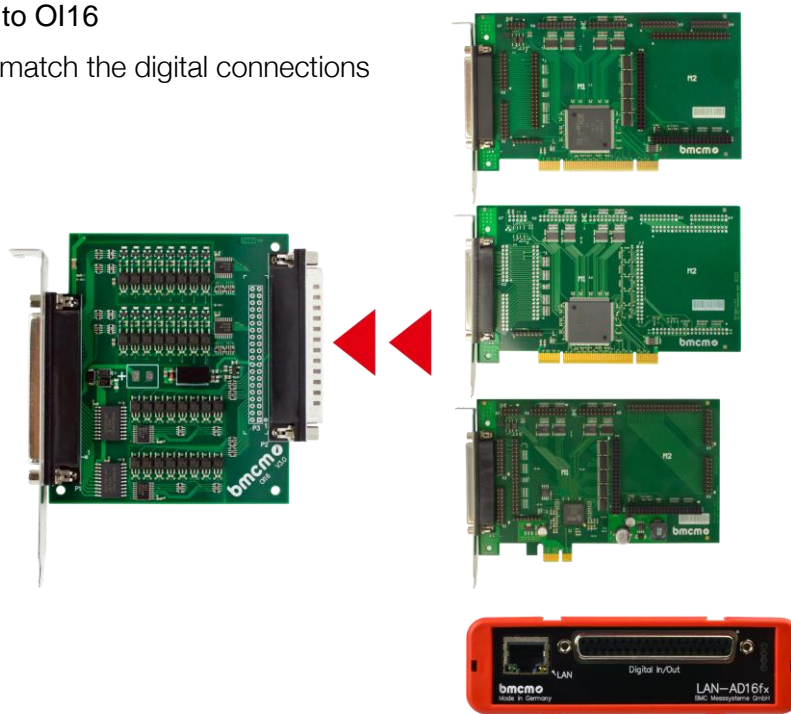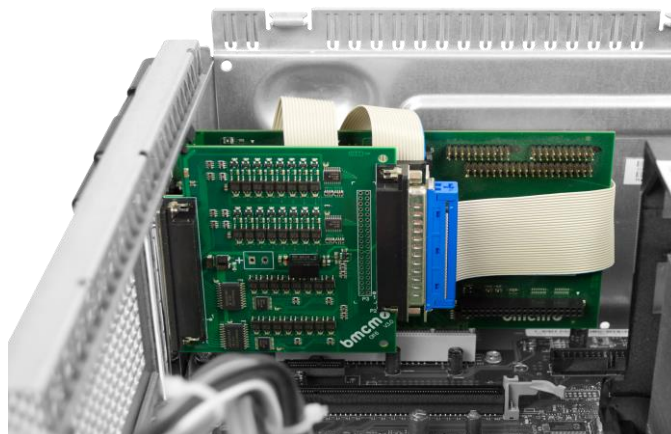The DAQ systems provide the necessary power supply for the OI16 card.

Foto: various DAQ cards and systems with OI16

2.2 Building the OI16 into a PC

The OI16 card can be fitted with a slot frame and therefore can be placed right next to the internal card. We recommend to connect the measurement cards via the optionally available cabel ZUKA16.

Picture: measurement card with OI16 in PC

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:	3…32V DC (>2,5V = high), max. 60V DC for 10sec.
Input current:	max. 10mA

Digital outputs

Number:	16 digital outputs, galvanically isolated byoptocouplers with 2 high-side drivers
Switching voltage:	5V DC (internal supply) or 7..32V DC (external supply)
Voltage drop (with ext. supply):	app. 1.5V at the high-side driver
Switching current (with ext. supply):	max. 0.25A per output, max. 0.8A in total per 8-bit high-side driver at 25°C

General

Power supply:	5V DC, ±5%, own consumption max. 1W DC
Connection (application hardware):	37-pol. D-Sub female
Connection (DAQ and control system):	37-pol. D-Sub male
Bandwidth:	1MHz
Temperature range:	Operating temp. -25°C..+60°C / storage temp. –25°C..+70°C
Relative humidity:	0..90% (not condensating)
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):	Connection cabels ZUKA16ST, ZUKA37SB, ZUKA37SS, D-Sub Stecker ZU37ST
Warranty:	2 years from date of purchase at bmcm, claims for damages resulting from improper use excluded