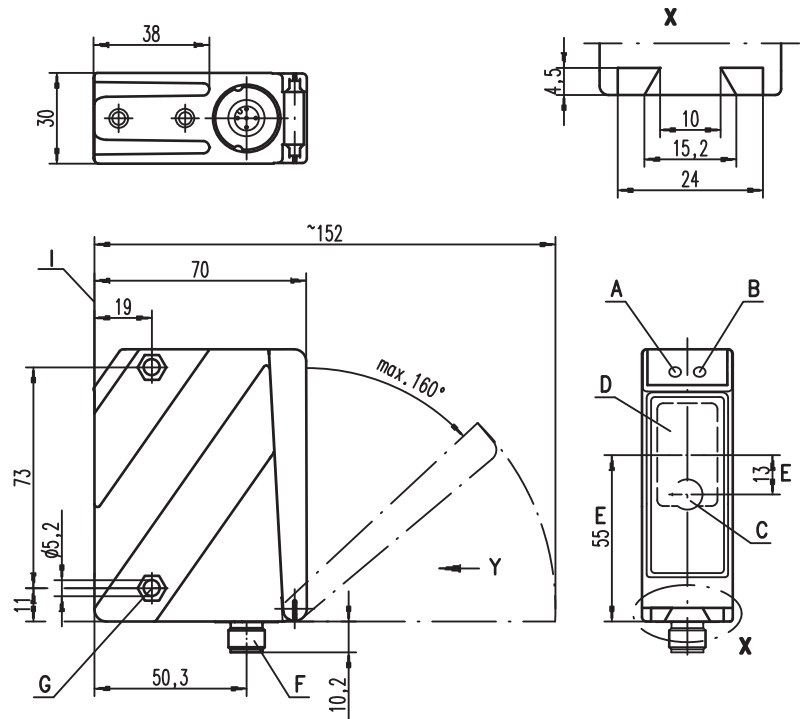


## ODSL 96B



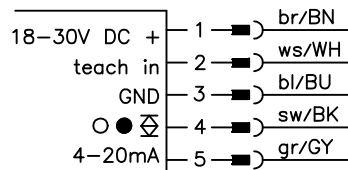
### Dimensioned drawing



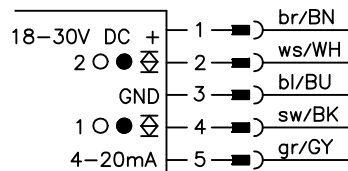
- A** Green indicator diode
- B** Indicator diode yellow
- C** Transmitter
- D** Receiver
- E** Optical axis
- F** Device plug M12x1
- G** Countersinking for SK nut M5, 4.2mm deep
- H** OLED display and membrane keyboard
- I** Reference edge for the measurement (cover glass)

### Electrical connection

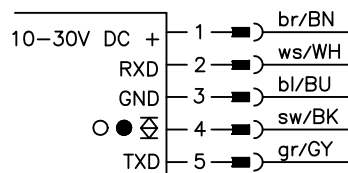
ODSL 96B M/C6...



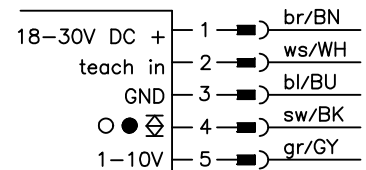
ODSL 96B M/C66...



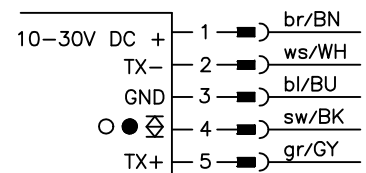
ODSL 96B M/D26...



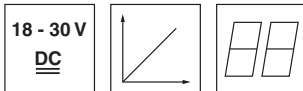
ODSL 96B M/V6...



ODSL 96B M/D36...



0.3 ... 10m



- Measurement range up to 10000mm at 90% diffuse reflection
- Reflection-independent distance information up to 6000mm
- Highly insensitive to extraneous light
- Analog current or voltage output
- PC/OLED display and membrane keyboard for configuration
- Measurement value is indicated in mm on OLED display
- Measurement range and mode adjustable



### Accessories:

(available separately)

- Mounting systems
- Cable with M12 connector (K-D ...)
- Configuration software

## Specifications

### Optical data

|                      |                                                                                              |
|----------------------|----------------------------------------------------------------------------------------------|
| Measurement range    | 300 ... 10000mm (90 % diffuse reflection),<br>300 ... 6000mm (6 ... 90 % diffuse reflection) |
| Resolution           | 3mm                                                                                          |
| Light source         | laser                                                                                        |
| Wavelength           | 658nm (visible red light)                                                                    |
| Light spot           | approx. 7x7mm <sup>2</sup> at 10m                                                            |
| Laser warning notice | see Remarks                                                                                  |

### Error limits (relative to measurement range end value 6000mm)

|                                             |           |
|---------------------------------------------|-----------|
| Absolute measurement accuracy <sup>1)</sup> | ± 0.5 %   |
| Repeatability <sup>2)</sup>                 | ± 5mm     |
| B/W detection thresh. (6 ... 90% rem.)      | ± 10mm    |
| Temperature drift                           | ± 1.5mm/K |

### Timing

|                       |                                                                                                                       |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------|
| Measurement time      | "Fast" operating mode: 1.4ms<br>"Standard" operating mode: 10ms<br>"Precision" operating mode: 50ms (factory setting) |
| Delay before start-up | ≤ 300ms                                                                                                               |

### Electrical data

|                                  |                                                                                                                                                                                                                                                                                   |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Operating voltage U <sub>B</sub> | ...C6/C66/V6 18 ... 30VDC (incl. residual ripple)<br>...D26/D36 10 ... 30VDC (incl. residual ripple)                                                                                                                                                                              |
| Residual ripple                  | ≤ 15% of U <sub>B</sub>                                                                                                                                                                                                                                                           |
| Open-circuit current             | ≤ 150mA                                                                                                                                                                                                                                                                           |
| Switching output                 | push-pull switching output <sup>3)</sup> ,<br>PNP light switching, NPN dark switching                                                                                                                                                                                             |
| Signal voltage high/low          | ≥ (U <sub>B</sub> -2 V)/≤ 2V                                                                                                                                                                                                                                                      |
| Analog output                    | ...V6 voltage 1 ... 10V / 0 ... 10V / 1 ... 5V / 0 ... 5V, R <sub>L</sub> ≥ 2kΩ<br>...C6/C66 current 4 ... 20mA, R <sub>L</sub> ≤ 500Ω<br>...D26/D36 RS 232/RS 485, 9600 ... 57600Bd,<br>1 start bit, 8 data bits, 1 stop bit, no parity<br>14 bit, 16 bit, ASCII, Remote Control |
| Serial interface                 |                                                                                                                                                                                                                                                                                   |
| Transmission protocol            |                                                                                                                                                                                                                                                                                   |

### Indicators

|            |                  |
|------------|------------------|
| Green LED  | continuous light |
|            | off              |
| Yellow LED | continuous light |
|            | off              |

### Teach-in on GND

|                                        |
|----------------------------------------|
| ready                                  |
| no voltage                             |
| object within range / switching output |
| object out of range / switching output |

### Mechanical data

|                 |               |
|-----------------|---------------|
| Housing         | diecast zinc  |
| Optics cover    | glass         |
| Weight          | 380g          |
| Connection type | M12 connector |

### Metal housing

### Environmental data

|                                   |                                       |
|-----------------------------------|---------------------------------------|
| Ambient temp. (operation/storage) | -20 °C ... +50 °C / -30 °C ... +70 °C |
| Protective circuit <sup>4)</sup>  | 1, 2, 3                               |
| VDE safety class <sup>5)</sup>    | II, all-insulated                     |
| Protection class                  | IP 67, IP 69K <sup>6)</sup>           |
| Laser class                       | 2 (acc. to EN 60825-1)                |
| Standards applied                 | IEC 60947-5-2                         |

- 1) For 300 ... 6000mm measurement range, luminosity coefficient 6% ... 90%, "Precision" operating mode, floating average calculation taking 30 measurement values into account, at 20 °C after 20 min. warmup time, medium range of U<sub>B</sub>, measurement object ≥ 50x50mm<sup>2</sup>
- 2) Same object, identical environmental conditions, "Precision" operating mode, floating average calculation taking 30 measurement values into account, after 20 min. warmup time, measurement object ≥ 50x50mm<sup>2</sup>
- 3) The push-pull switching outputs must not be connected in parallel
- 4) 1=transient protection, 2=polarity reversal protection, 3=short circuit protection for all outputs
- 5) Rating voltage 250VAC, with cover closed
- 6) IP 69K test in accordance with DIN 40050 part 9 simulated, high pressure cleaning conditions without the use of additives. Acids and bases are not part of the test

## Order guide

### Analogue current output

|                                                 |                    |          |
|-------------------------------------------------|--------------------|----------|
| Current output, teach input, 1 push/pull output | ODSL 96B M/C6-S12  | 50109290 |
| Current output, 2 push/pull outputs             | ODSL 96B M/C66-S12 | 50109295 |

### Analogue voltage output

|                                                 |                   |          |
|-------------------------------------------------|-------------------|----------|
| Voltage output, teach input, 1 push/pull output | ODSL 96B M/V6-S12 | 50109291 |
|-------------------------------------------------|-------------------|----------|

### Serial digital output

|                            |                    |          |
|----------------------------|--------------------|----------|
| RS 232, 1 push/pull output | ODSL 96B M/D26-S12 | 50109292 |
| RS 485, 1 push/pull output | ODSL 96B M/D36-S12 | 50109293 |

ODSL 96B M/... - 05

## Tables

## Diagrams

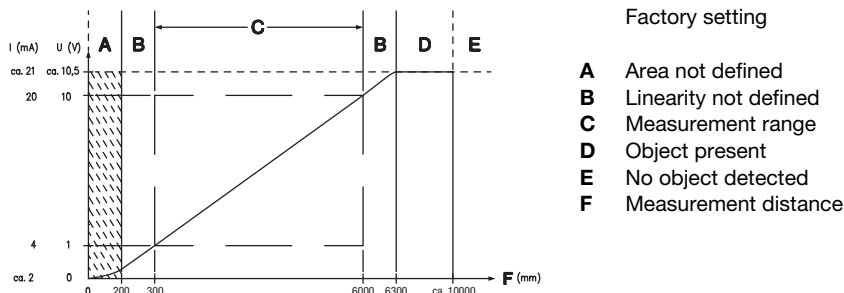
## Remarks

- **Approved purpose:**  
The ODSL 96B laser distance sensors are optoelectronic sensors for the optical, contactless measurement of the distance to objects.  
This product may only be used by qualified personnel and must only be used for the approved purpose. This sensor is not a safety sensor and is not to be used for the protection of persons.

|                                               |        |
|-----------------------------------------------|--------|
| LASERSTRAHLUNG<br>NICHT IN DEN STRAHL BLICKEN |        |
| Max. Leistung:                                | 248 mW |
| Impulsdauer:                                  | 6,5 ns |
| Wellenlänge:                                  | 658 nm |
| LASER KLASSE 2<br>DIN EN60825-1:2003-10       |        |

## ODSL 96B

### Analog output: characteristic curve for factory setting



### Serial output: transmission protocol for factory setting

9600Bd, 1 start bit, 8 data bits, 1 stop bit,  
transmission protocol ASCII measurement values

Transmission format: **MMMMM<CR>**

**MMMMM** = 5-digit measurement value in mm (resolution 1 mm)

**<CR>** = ASCII character "Carriage Return" (x0D)

### Measurement mode and measurement filter

The user can individually adapt the measurement system of the ODSL 96B to various applications. By configuring the measurement mode and measurement filter, either a higher measurement accuracy or, alternatively, faster measurements can be achieved. Configuration can be performed either directly on the sensor or with the ODS 96B configuration software.

#### Optimization of measurement mode

In the Application menu, you can set 3 different measurement filters.

| Menu setting                             | Effect                                                              |
|------------------------------------------|---------------------------------------------------------------------|
| Application -> Measure Mode -> Precision | high accuracy, measurement time of individual measurement: 50ms     |
| Application -> Measure Mode -> Standard  | exact and fast, measurement time of individual measurement: 10ms    |
| Application -> Measure Mode -> Speed     | fast measurement, measurement time of individual measurement: 1.4ms |

#### Optimization of measurement filter

To achieve more precise measurement values, a measurement filter can be adjusted in addition to the measurement mode. In most cases, the use of a floating average results in a reduction in the variance of the measurement values.

To use this, select the menu setting **Application -> Measure Filter -> Averaging**.

The number of measurement values to be taken into account can be set to a value between **1 ... 99** via menu setting

**Application -> Measure Filter -> Averaging -> Measur. Count.**



#### Notice!

The measurement value display on the OLED display can be used to assess the efficiency of the selected measurement mode and measurement filter in the application. The update rate of the OLED display is always 2Hz. The ODS 96B configuration software provides identical functionality.

#### Factory setting of measurement mode:

On delivery, the sensor is preset so that measurement values with the maximum possible accuracy are achieved:

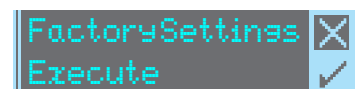
- Measurement mode **Precision**.

### Reset to factory settings

Press the button while switching on the device to reset the configuration of the ODSL 96B to the state upon delivery from the factory.

Press the button again to reset all parameters to the factory settings. All settings made previously are permanently lost.

Press and the ODSL 96B returns to measurement operation without resetting the parameters.



You can also use the menu or the configuration software to reset to factory settings. For this purpose, select menu item **Settings -> FactorySettings -> Execute**.

The ODS 96B configuration software can also be used to reset the ODSL 96B to factory settings.

## Teach-in of switching outputs, analog characteristic output curve and Preset

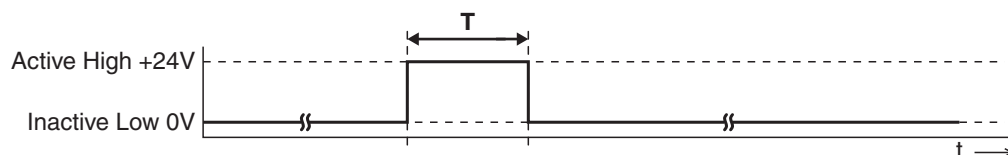


### Notice!

If you have changed the factory setting for teaching under Input Mode, activate on the OLED display the menu item **Input -> Input Mode -> Teach**.

To teach, proceed as follows:

1. Position measurement object at the desired measurement distance.
2. The respective teach function is activated on the teach input for the duration of a level change **T** (see graphical representation).  
The level conditions describe the levels with menu setting **Input -> Input Mode -> Input polarity -> Active High +24V** (factory setting).



| Teach function                                                              | Duration T    |
|-----------------------------------------------------------------------------|---------------|
| Switching output Q1                                                         | 20 ... 80ms   |
| Distance value for start of measurement range = 1V or 4 mA at analog output | 220 ... 280ms |
| Distance value for end of measurement range = 10V or 20mA at analog output  | 320 ... 380ms |



### Notice!

If the inactive level is continuously applied on the teach input, the teach input is locked.

For menu setting **Input -> Input Mode -> Input polarity -> Active Low +0V**, inverted input signals are used during teaching.

## Preset Teach-In

On the OLED display, activate for this purpose menu item **Input -> Input Mode -> Preset**.

The preset teach occurs in a manner analogous to that for the teach-in for switching output Q1.

## Working safely



### Attention Laser Radiation!

**The optical distance sensors ODSL 96B operate with a red light laser of class 2 acc. to EN 60825-1. If you look into the beam path over a longer time period, the retina of your eye may be damaged!**

**Never look directly into the beam path! Do not point the laser beam of the ODSL 96B at persons!**

**When mounting and aligning the ODSL 96B take care to avoid reflections of the laser beam off reflective surfaces!**

**The use of operating and adjusting devices other than those specified in the technical description, carrying out of differing procedures, or improper use of the optical laser distance sensor may lead to dangerous exposure to radiation!**

**The use of optical instruments or devices in combination with the device increases the danger of eye damage!**

**Adhere to the applicable legal and local regulations regarding protection from laser beams acc. to EN 60825-1 in its latest version.**

**The ODSL 96B uses a laser diode with low power in the visible red light range with an emitted wavelength of about 658nm.**

**The glass optics cover is the only opening through which the laser radiation can escape from the device. The housing of the ODSL 96B is sealed and has no parts that need to be adjusted or maintained by the user. The device must not be tampered with and must not be changed in any way! The destruction of the seal voids the warranty!**



### Notice!

**It is important that you attach the sticky labels supplied to the device (notice signs and laser emission symbol)! If the signs would be covered due to the installation situation of the ODSL 96B, attach them close to the ODSL 96B such that reading the notices cannot lead to looking into the laser beam!**