

LV462

Amplifier for fiber optics

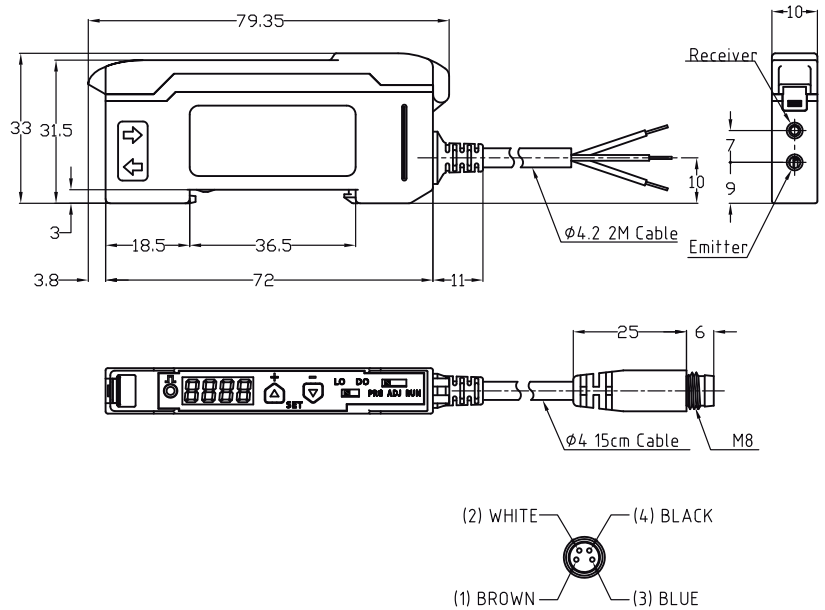
en 01-2012/05 50118005



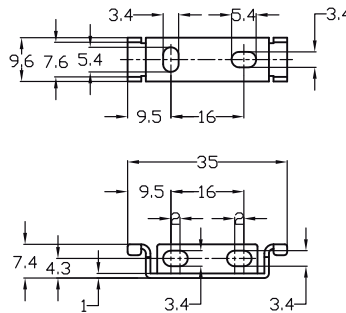
up to 525mm  
 up to 120mm  
 10 - 30 V DC

- 3-digit display for indicating and setting the switching threshold
- NEW: AutoSet function for easy sensor adjustment
- Menu functions for setting the range and various time functions
- Switch for changing between light and dark switching
- PNP or NPN switching output
- Indicator diode for operation and switching output
- Connection via cable or cable with M8 connector

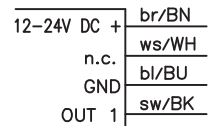
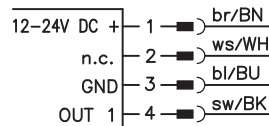
Dimensioned drawing



Supplied mounting accessories



Electrical connection



Accessories:

(available separately)

- Plastic fiber optics (KF, KFX)
- Ready-made cables (KB ...)

We reserve the right to make changes • DS\_LV462\_en\_50118005.fm



## Specifications

### Optical data

Operating range/scanning range <sup>1)</sup>  
Light source  
Wavelength

### Throughbeam principle

up to 525mm  
LED (modulated light)  
660nm (visible red light)

### Scanning principle

up to 120mm

### Timing

Switching frequency <sup>2)</sup>  
Response time  
Delay before start-up

### Setting SP-H

500Hz  
1ms  
≤ 450ms

### Setting SP-L

250Hz  
2ms

### Electrical data

Operating voltage  $U_B$   
Residual ripple  
Open-circuit current  
Switching output  
.../4...  
.../2...

12 ... 24VDC ± 10%  
≤ 10% of  $U_B$   
≤ 45mA  
pin 4/black: PNP  
pin 4/black: NPN  
light/dark switching, adjustable by means of a switch  
switch-on/switch-off delay,  
passing contact (on actuation or fall-back),  
adjustable times: 2ms, 20ms, 50ms, 100ms, 500ms, 1s, 5s, 10s  
≥ ( $U_B - 2.5V$ ) / ≤ 2.5V  
≤ 100mA  
adjusted using the AutoSet function or +/- buttons

Function  
Switching output time functions

Signal voltage high/low  
Output current  
Sensitivity

### Indicators

Red LED  
Display

Switching output active  
7-segment LED, 4-digit,  
display of switching threshold/operating mode,  
menu-driven sensor setting

### Mechanical data

Housing  
Weight  
Connection type

ABS  
63g with 2000mm cable  
70g with 150mm cable and M8 connector  
cable 2000mm, 3 x 0.25mm<sup>2</sup>, or  
cable 150mm with M8 connector, 4-pin  
clamp-mounting, 2 x Ø 2.2mm

Fiber optic connection

### Environmental data

Ambient temp. (operation/storage)  
Protective circuit <sup>3)</sup>  
Protection class  
Standards applied

-10°C ... +60°C / -40°C ... +70°C  
2, 3  
IP 54  
EN 60947-5-2

### Options

Sensor setting menu-driven using display and +/- buttons

- 1) Operating range/scanning range dependent on the fiber optics used  
2) With a duty cycle of 1:1  
3) 2=polarity reversal protection, 3=short circuit protection for all outputs

## Order guide

|   | Designation       | Part no. |
|---|-------------------|----------|
| <b>PNP types</b>                                  |                   |          |
| Connection: cable 2000mm, 3 x 0.25mm <sup>2</sup> | LV462.4/4         | 50118400 |
| Connection: cable 150mm with M8 connector, 4-pin  | LV462.4/4X-150-M8 | 50118401 |
| <b>NPN types</b>                                  |                   |          |
| Connection: cable 2000mm, 3 x 0.25mm <sup>2</sup> | LV462.4/2         | 50118402 |
| Connection: cable 150mm with M8 connector, 4-pin  | LV462.4/2X-150-M8 | 50118403 |

## Tables



### Notice!

Detailed specifications on the range/scanning range are enclosed in the data sheets of our fiber optics type **KF** or **KFX**.

## Diagrams

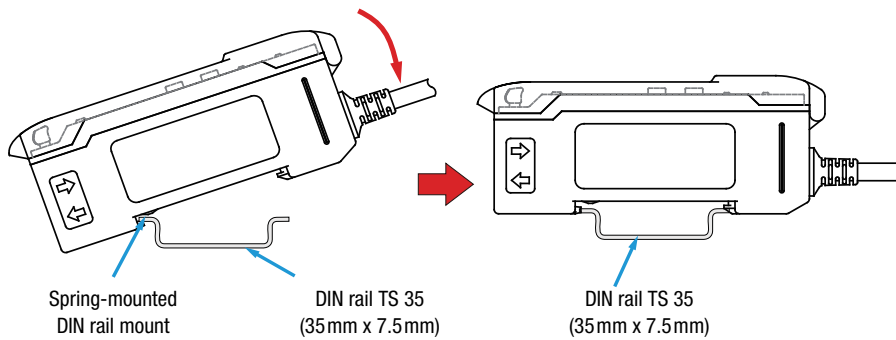
## Remarks

- **Approved purpose:**  
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.

**LV462**

**Amplifier for fiber optics**

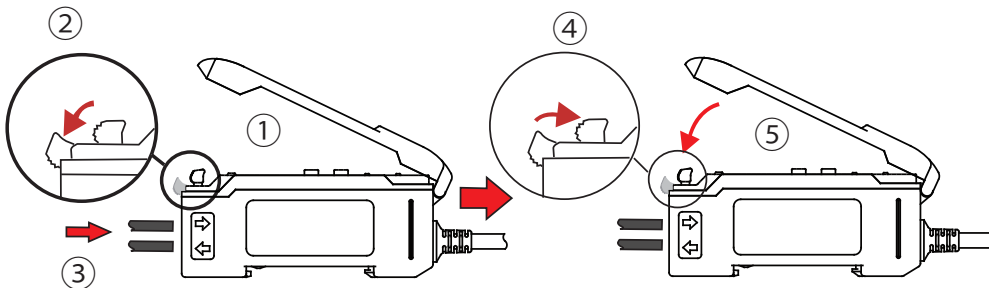
**Mounting the amplifier**



The amplifier is mounted as shown on a TS 35 DIN rail while disconnected from voltage.

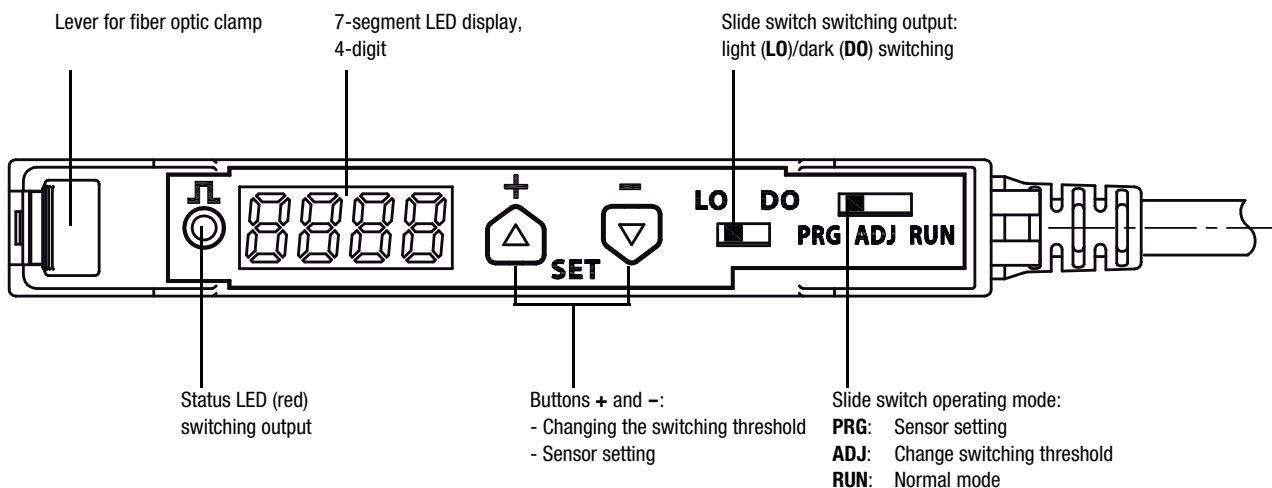
Alternatively, the amplifier can also be mounted without a DIN rail using the mounting accessory (supplied) and M3 screws.







**Installing the fiber optics**



- ① Open the transparent protective cover.
- ② Push down the lever of the fiber optic clamp to open.
- ③ Lead the **KF/KFX** type fiber optics in completely as far as they will go (ca. 12mm deep) into the fiber optic intake.  
**When doing so, observe the transmitter/receiver assignment** on the amplifier (transmitter at bottom / receiver on top).
- ④ Pull up the lever of the fiber optic clamp to close. Check if the clamp is secure by pulling lightly on the fiber optics.
- ⑤ Close the transparent protective cover.

**Controls and indicators**



























|   |   |   |
|---|---|---|
|  | Selector switch<br><b>Operating mode</b>          | <b>RUN:</b> normal mode - no settings possible<br><b>ADJ:</b> <b>AutoSet</b> function is possible, switching threshold can be adjusted with buttons + and -<br><b>PRG:</b> menu-driven device setting via display and buttons + and -   |
|  | Selector switch<br><b>Switching output</b>        | <b>LO:</b> switching output <b>light switching</b> : if throughbeam fiber optics are installed, the switching output is active when the light path is free; if a scanning system is installed, the switching output is active when an object is detected. The status LED illuminates when the switching output is active.<br><b>DO:</b> switching output <b>dark switching</b> : the switching behavior is the inversion of the <b>light switching</b> setting. |
|  | Control buttons<br>+ and -                        | Button +: the value in the display is incremented by 1 digit each time the button is pressed.<br>Button -: the value in the display is decremented by 1 digit each time the button is pressed.<br><b>Note:</b> If a button is kept pressed, the value in the display is continuously changed in steps of 10.  |
|  | Indicator<br><b>Transmitting power</b>            | the <b>first location on the left</b> of the display indicates the set transmitting power in operating modes <b>RUN</b> and <b>ADJ</b><br><b>H:</b> standard sending pulse length (setting <b>SP-H</b> )<br><b>L:</b> long sending pulse for more range (setting <b>SP-L</b> )  |
|  | Indicator<br><b>Switching threshold</b>           | the <b>3 locations to the right</b> of the screen indicate the set switching threshold in operating modes <b>RUN</b> and <b>ADJ</b> (value range: <b>000 ... 999</b> ). depending on the setting <b>LO / DO</b> , the sensor switches when the set switching threshold value is undershot or overshot.  |
|  | Status LED (red)<br><b>Switching output state</b> | <b>LED ON</b> switching output active.<br><b>LED OFF</b> switching output inactive.   |

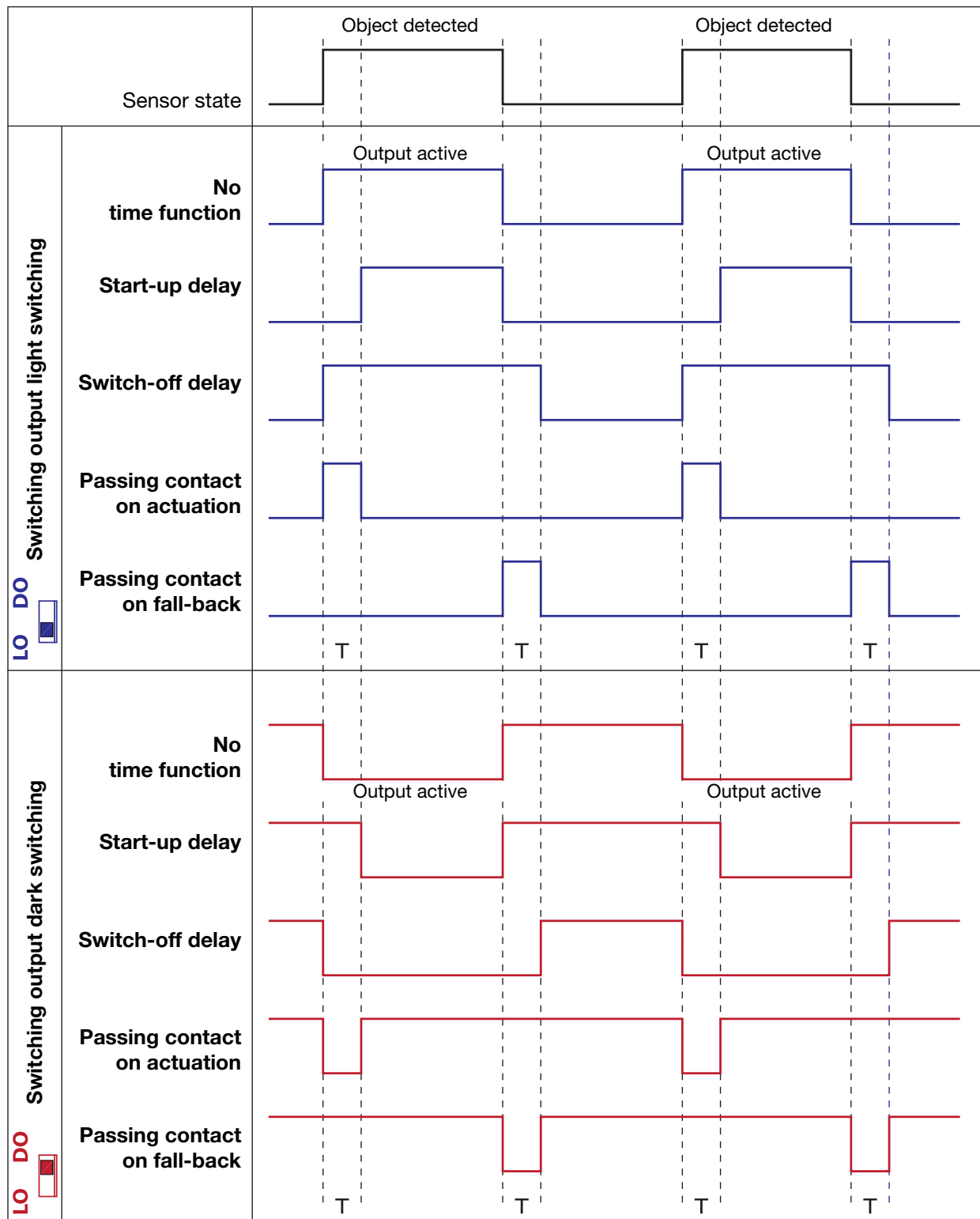
### Menu-driven sensor setting

The LV462 can be adjusted to meet customer requirements with a simple menu-driven system. To do this, set the **selector switch** for the **operating mode** to position **PRG**.



| Function   |  | Direction of movement in the menu  on pressing the button |  |   |  |  |
|--|--|---|--|---|--|--|
| Direction of movement in the menu  on pressing the button | <b>Sending pulse length</b><br>(Sending pulse) |  short   |  long           |   |  |  |
|  | <b>Sending pulse power</b><br>(Power)          |  50%   |  100%           |   |  |  |
|  | <b>Display brightness</b><br>(Power save)      |  standard  |  reduced        |  minimum          |  |  |
|  | <b>Time function</b><br>(Delay)                |  no time function  |  start-up delay |  switch-off delay |  passing contact on actuation |  passing contact on fall-back |
|  | <b>Delay time</b>                              |  t = 2ms   |  t = 20ms       |  t = 50ms         |  t = 100ms                    |  t = 500ms                    |
|  |  |  t = 1s  |  t = 5s         |  t = 10s          |  |  |
|  |  |  standard  |  turned by 180° |   |  |  |
| <b>Display orientation</b><br>(Display position)   |  |   |  |   |  |  |

Time functions



T is the set delay time dt-1 ... dt-8.

Only one of the four possible time functions can be activated at any given time. First select the required function and then assign a delay time to it.

Example: A switch-off delay of 100ms is to be set

1. Select "switch-off delay" time function:

2. Select "100ms" delay time:

## Adjusting the operating range

Menu functions **sending pulse length** and **sending pulse power** are used to adjust the range.

Setting in the menu:

- SP-L / Po-2** XLR = 4 x SR maximum operating/scanning range (extra long range)
- SP-L / Po-1 or SP-H / Po-2** LR = 2 x SR medium operating/scanning range (long range)
- SP-H / Po-1** SR minimum operating/scanning range (standard range)

### Recommended settings:

| Application        | Type of object  | Object size  | Operating/scanning range | Range | Configuration             |
|--------------------|-----------------|--------------|--------------------------|-------|---------------------------|
| Scanning system    | not transparent | any          | long                     | XLR   | SP-L / Po-2               |
|                    | not transparent | large, plane | medium                   | LR    | SP-L / Po-1   SP-H / Po-2 |
|                    | transparent     |              | long                     | XLR   | SP-L / Po-2               |
|                    |                 |              | medium                   | LR    | SP-L / Po-1   SP-H / Po-2 |
| Throughbeam system | not transparent | rather large | long                     | XLR   | SP-L / Po-2               |
|                    | not transparent | small parts  | medium                   | LR    | SP-L / Po-1   SP-H / Po-2 |
|                    | transparent     | any          | long                     | LR    | SP-L / Po-1   SP-H / Po-2 |
|                    |                 |              | short                    | SR    | SP-H / Po-1               |
|                    |                 |              |                          |       |                           |

## Adjusting the switching threshold

To set the switching point, the switching threshold must be set.

To set the switching threshold, set the **selector switch** for the **operating mode** to the **ADJ** position.



The switching output is active when

- the switching threshold in the **light switching setting (LO)** is **overshot** by the reception signal in the sensor.
- the switching threshold in the **dark switching setting (LD)** is **undershot** by the reception signal in the sensor.

### Setting the switching threshold using the AutoSet function

(based on the example of a scanning system - a throughbeam system is set analogous to this)

| Switching output light switching   | LO DO                    | Switching output dark switching  | LO DO                    |
|--|--------------------------|--|--------------------------|
| Selector switch <b>switching output</b> in position <b>LO</b> ,<br>Setting to maximum range <b>SP-L / Po-2</b>   | <input type="checkbox"/> | Selector switch <b>switching output</b> in position <b>DO</b> ,<br>Setting to maximum range <b>SP-L / Po-2</b>   | <input type="checkbox"/> |
| <ol style="list-style-type: none"> <li>① Place object in light beam.</li> <li>② Press button <b>-</b> and reduce switching threshold to <b>000</b>.<br/>The red status LED for the switching output is <b>OFF</b>.</li> <li>③ Press button <b>+</b> and keep pressed until the red status LED for the switching output is <b>ON</b>. Release the button.</li> <li>④ Ready - the sensor is now set.</li> <li>④ Check cut-in/cut-out point.<br/>Fine adjustment of the switching threshold is possible by briefly pressing button <b>+</b> or <b>-</b>.</li> </ol> |                          | <ol style="list-style-type: none"> <li>① Place object in light beam.</li> <li>② Press button <b>-</b> and reduce switching threshold to <b>000</b>.<br/>The red status LED for the switching output is <b>ON</b>.</li> <li>③ Press button <b>+</b> and keep pressed until the red status LED for the switching output is <b>OFF</b>. Release the button.</li> <li>④ Ready - the sensor is now set.</li> <li>④ Check cut-in/cut-out point.<br/>Fine adjustment of the switching threshold is possible by briefly pressing button <b>+</b> or <b>-</b>.</li> </ol> |                          |
| <b>Remarks:</b><br>The sensor is optimally set when the displayed switching threshold is 50 ... 100 digits.<br>If the displayed value is smaller, reduce the range. If the value shown is near to setting limit <b>999</b> , then set a higher range.<br>If, at a displayed value of <b>999</b> , the status LED is not <b>ON</b> , then the range is too low.<br>Check the range setting, reduce the object distance.   |                          | If, at a displayed value of <b>999</b> , the status LED is not <b>OFF</b> , then the range is too low.<br>Check the range setting, reduce the object distance.   |                          |

## Manual adjusting of the switching threshold

If the **selector switch** for the **operating mode** is in the **ADJ**, position, the switching threshold can be set manually.

Button **+**: The switching threshold in the display is incremented by 1 digit each time the button is pressed.

Button **-**: The switching threshold in the display is decremented by 1 digit each time the button is pressed.

If a button is kept pressed, the value in the display is continuously changed in steps of 10.