

Photo-electric Multiplexer

4-channel Multiplexer

- Multichannel amplifier with modulated infrared light
- 4-channel installation system for tight assembly without cross talk
- Range up to 25 m (82ft)
- Sensitivity for each channel adjustable with potentiometer
- One relay output for each channel (changeover)
- System power 20 % / 100 % selectable by bit switch
- Programmable light / dark function
- Adjustable switch-on and switch-off delay for channel one
- Light curtain mode
- Master-slave mode
- Transmitter and receiver terminals are short circuit proof



Description

On the 4-channel multiplexer with manual gain setting from **ipf** can work up to four Sensor heads (transmitter and receiver) without the possibility of cross talk.

The multiplexer has one relay output (change over) and a yellow status LED for each channel.

Different working conditions can be selected, according to the application, for each channel on the front side of the device by easy accessible DIP-switches. Consequently, the user is able to change the sensitivity value, which is adjusted to needed range and pollution, for increasing the fine adjustment of the potentiometer or to optimize the object recognition. The light curtain mode enables, that all outputs have an effect on the relay from channel number one.

If more than four channels are required, multiple 4-channel multiplexers (automatic or manual gain

setting) can be connected to synchronize them by master-slave operation. In this way, an influencing signal between the multiplexers will be prevented.

Ordering Guide

Description	Model
sensor opt, amplifier 230VAC, 4 rel, 0-15s, multiplex	OV 544920
sensor opt, amplifier 24VDC, 4 rel, 0-15s, multiplex	OV 540920



Safety Instructions

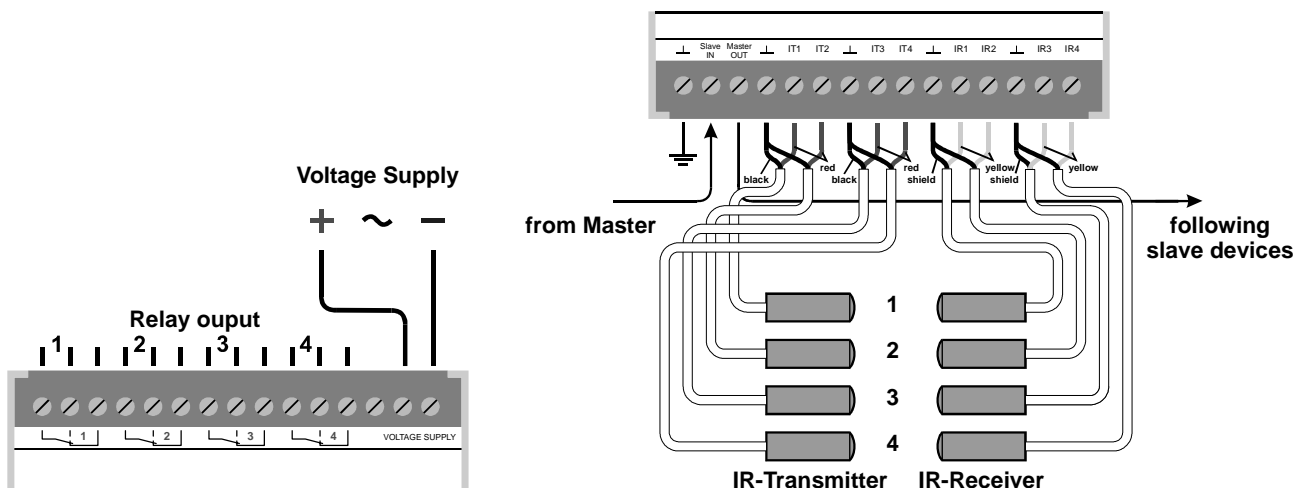
The operation of infrared multiplexer OV... is not authorized for applications where safety of the person depends on the device function.

Technical Data

Operating basis	modulated IR-light
max. Range (through beam)	
OS+OE106... 126... 136...	15 m
OS991... + OE106...	20 m
OS991... + OE126...	20 m
OS991... + OE136...	20 m
Displays:	
Switching mode	4 x LED yellow
Sensitivity	4 x LED green
Power on	LED green
Slave mode	LED yellow
Light curtain mode	LED yellow
Switching mode	light / dark, switchable
Curtain mode	yes
Slave-function	yes
Switching delay	0 - 15 s
ALC delay	no
Housing material	
	plastic (Makrolon 8030)
Housing protection	
	IP 20
Temperature (operation)	
	-25 °C ... +60 °C
Temperature (storage)	
	-40 °C ... +80 °C

Supply voltage	230 V AC (OV 544920)
	24 V DC (OV 540920)
Voltage tolerance	10 %
Power consumption	...AC: 6 VA; ...DC: 6 W
Transmit frequency	4,0 kHz
System power	20 % / 100 %, switchable
Multiplex speed:	
low	32 ms (31 Hz)
high	16 ms (62 Hz)
Relay output:	1 changeover per channel
Switching data (max.)	5 A, 230 V AC (24 V DC)
Reaction time T_{Ein} / T_{Aus}	25 ms / 25 ms
Switching frequency	20 Hz
Alarm output	no
Terminals	clip 4 mm ²
Mounting orientation	free
Mounting	2 Bohrungen (DIN 46 121)
	Normschiene (DIN 46 277)
Dimension (mm)	L 75 x B 100 x H 110

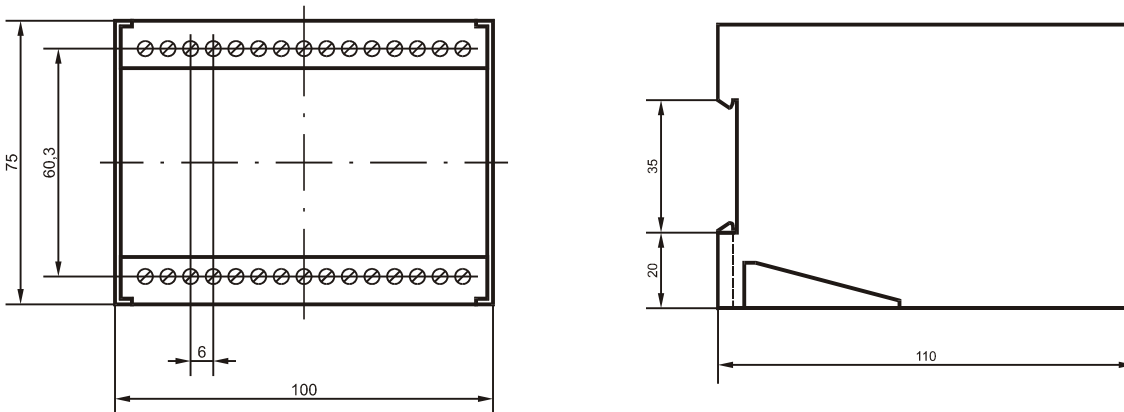
Wiring diagram



CAUTION!

The AC-supply devices are isolated from main. A grounded connection on the low voltage side is required. In synchronized operation of multiple devices (master/slave), we recommend installation using short connecting cables.

Dimensions



dimensions in millimeter

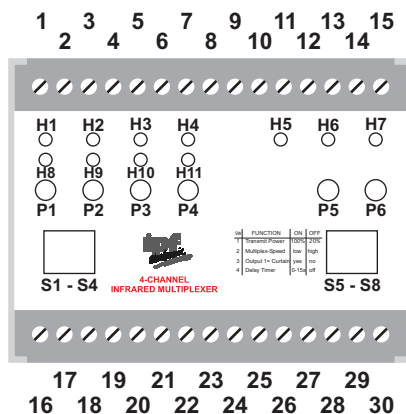
General Description

1. Principle of operation

The system (consisting of one to four transmitters and receivers and one multiplexer) works with modulated infrared light. The device activates the sensor heads cycling one after the other (multiplex operation). During the activation, the state of each channel is evaluated. According to the channel's condition, the display and outputs are set.

2. Connections

Wires are connected with two rows of 15 terminals (see picture 1).



Picture 1: Number of terminals

a) Voltage supply¹

Before connecting the multiplexer, look on the side and check if the power supply is the same as the connection value. The power supply will be connected on the terminal no. 14 and no. 15 (see picture 1). For devices with direct current, terminal no. 14 is positive and terminal no. 15 is neutral.

b) Transmitter (OS...)¹

Four infrared transmitters can be connected to one 4-channel multiplexer. Connect the transmitters as shown in table 1.

Transmitter	Plus (red) ²	Ground (black) ²
1	No. 20	No. 19
2	No. 21	No. 19
3	No. 23	No. 22
4	No. 24	No. 22

Table 1: Transmitter terminals

c) Receiver (OE...)¹

Four infrared receivers can be connected to one 4-channel multiplexer. Connect the receivers as shown in table 2.

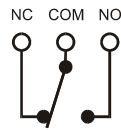
Receiver	Plus (yellow) ³	Ground (shield) ³
1	No. 26	No. 25
2	No. 27	No. 25
3	No. 29	No. 28
4	No. 30	No. 28

Table 2: Receiver terminals

d) Relay output

The amplifier has one relay (changeover) with the maximum allowable current of 5 A.

A contact arrangement in which PIN 1 opens its connection to PIN 4, and then closes its connection to PIN 3 (see picture 2). Connect the relay as shown in table 3.



picture 2: Relay output

Channel	COM	NO	NC
1	No. 1	No. 2	No. 3
2	No. 4	No. 5	No. 6
3	No. 7	No. 8	No. 9
4	No. 10	No. 11	No. 12

Table 3: Relay terminals

e) Master OUT

To synchronize more than one 4-channel multiplexer, the Master OUT output (connection terminal number 17, see picture 1) gives a signal to the following device.

Note: Don't connect the Master OUT terminal with the Master OUT terminal of the next device.

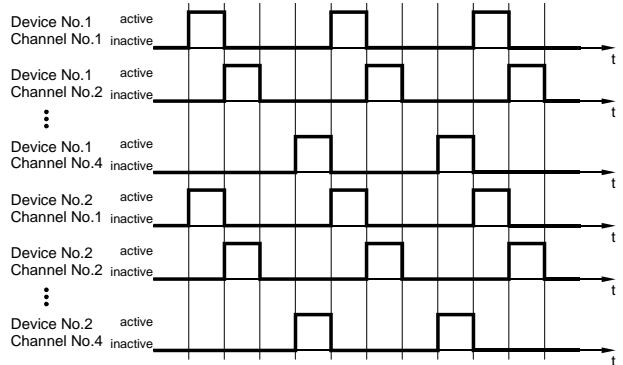
f) Slave IN¹

To synchronize more than one 4-channel multiplexer, the Slave IN input (connection terminal number 16, see picture 1) receives the signal from the previous device.

Note: The Slave IN connector should be wired to a Master OUT connector.

3. Master-Slave operation

The master-slave operation allows synchronized action of multiple 4 channel devices, including all Pantron manual and automatic series. Therefore, the same channel number is active on each device in the chain at the certain time (see picture 3). With a suitable arrangement of sensor pairs, the influence between the amplifiers can be prevented.



Picture 3: Master-Slave operation

Note: Don't wire the Master OUT terminal from the last device with the Slave IN terminal from the first device.

4. Function terminology

The functions are selectable by DIP-switches on the front side of the multiplexer.

a) Switching mode¹

The switching function describes the output behavior on interruption of the infrared beam. There are two types of switching functions:

Light mode operation (light)¹: relay contact closes (COM → NO).

Dark mode operation (dark)¹: relay contact opens (COM → NC).

b) Transmit Power¹

The transmit power of the amplifier can be switched to less sensitive.

100% The amplifier has the maximum sensitivity value. (highest range).

20% The amplifier has 20 % of the maximum sensitivity value.

c) Multiplex-Speed¹

The multiplex speed is the speed between activating the sensor heads one after another. If the multiplex speed high¹, the reaction time (T_{ON}/T_{OFF}) for all channels is short, the range gets shorter, because the evaluation unit has less time to check the infrared signal. If the multiplex speed is low¹, the reaction time (T_{ON}/T_{OFF}) for all channels is long and the range has the maximum value.

d) Curtain mode (Relay 1 = Curtain)¹

The light curtain function combines all the light barrier's relay outputs together into one output. It utilizes a link between the individual channels. If there is no interruption in the light circuit, the yellow mechanical on/off indicator, RELAY STATUS remain illuminated. Using the switching function, the circuit logic can be inverted.

Note: The first channel must connect by the curtain mode. There isn't a DIP-switch to change the switching mode.

e) Switching delay (Relay 1 - Timer)¹

The switching delay only effects on the relay from channel 1. The timer can be adjusted up to 15 seconds with two potentiometers (switching ON and OFF delay).

f) Switching-on delay (t-ON)¹

Switching-on delay is the time between the presence (light mode operation) or absence (dark mode operation) of the infrared beam and turning the output on (COM → NO).

g) Switching-off delay (t-OFF)¹

Switching-off delay is the time between the absence (light mode operation) or presence (dark mode operation) of the infrared beam and turning the output off (COM → NC).

¹ Inscription front label

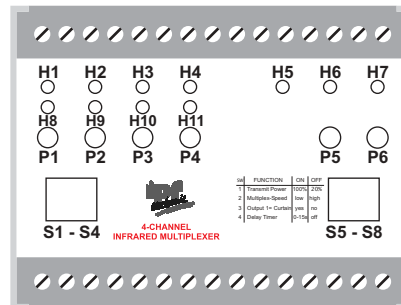
² Core coding transmitter cable

³ Core coding receiver cable

Operating Instructions

Display contents:

- H1 - H4: Relay status indicator (yellow)
- H5: Slave operation indicator (yellow)
- H6: Light curtain mode (yellow)
- H7: Power ON indicator (green)
- H8 - H11: Sensitivity indicator (green)
- P1 - P4: Sensitivity adjusters (channel 1 - 4)
- P5: Switching ON delay (relay no. 1)
- P6: Switching OFF delay (relay no. 1)
- S1 - S4: Switching mode (channel 1 - 8)
- S5 - S8: Functions



1. Choose the sensor heads

Before you turn on the multiplexer, select the transmitter and receiver for your application. Each channel needs one transmitter and one receiver. This includes choosing the sensor heads body style and cable length or quick disconnect that meets your requirements.

2. Installation of the multiplexer

The multiplexer can be installed with two holes (DIN 46121) or a DIN rain mounting clip (DIN 46277). The wiring diagram is printed on the front label of the multiplexer or see **Wiring diagram**. For further information see **General Description** point 2 **Connections**.

3. Choose the functions

The functions are selectable by DIP-switches located on the front side of the amplifier. For complete description of function, see **General Description** point 4 **Function terminology**.

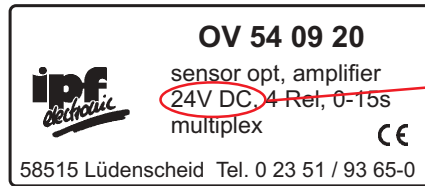
The switching mode is selectable by the DIP-switches S1 to S4. The number of the DIP-switch is equal with the number of the transmit channel. If the DIP-switch is in the OFF position the function is set to „light“ mode and if the DIP-switch is in the ON position the function is set to „dark“ mode. The selection of further functions is described in table 4.

transmit power ¹		Multiplex rate (Multiplex speed) ¹		Light curtain function (Output 1 =curtain) ¹		Time delay (Delay Timer) ¹	
	20 %		16 ms (high) ¹		inactive (no) ¹		inactive (off) ¹
	100 %		32 ms (low) ¹		active (yes) ¹		0 - 15 s

Table 4: DIP-switches S5-S8

4. Check the supply voltage

On the right side of the multiplexer is the type plate. Check if this value is the same as the connection value.



Supply voltage for example: 24 V DC

5. Operating procedure

Switch the power on. The green power indicator H7 (POWER ON)¹ lights green. The information (interrupt or clearance etc.) is evaluated and the state of the display and relays are shown. The displays H1 to H4 (RELAY-STATUS)¹ indicate the state of the relays. H8 to H11 (GAIN CONTROL)¹ indicate the state of the sensitivity. To guarantee the right operation of the amplifier, the sensitivity of each channel must be adjusted manually. Turn the potentiometer P1 (GAIN SETTING)¹ from the left side to the right side until the green sensitivity indicator H8 (GAIN CONTROL)¹ is lit constantly (adjustment for channel number one). Repeat the procedure for all channels. Should the potentiometer further adjusted to the right side, the amplifier will become less sensitive. For description of how the devices work, see table 5.

After adjustment the sensitivity indicator is an indicator for the right adjustment. After a long working time the sensor heads pollute and the sensitivity indicator is flashing and goes out at further pollution. To get the optimum operation, raise the sensitivity or clean the sensor heads.

Beam status	Switching mode	Relay status indicator	Relay output
	light		
	dark		
	light		
	dark		

Table 5: Switching logic

Note: If the sensitivity indicator is not lit, the contact between transmitter and receiver is interrupted or the distance between the sensor heads is too far.

¹ Inscription front label



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