

Photo-electric Multiplexer IMX-A832I (Industrial Module)

8-channel automatic Multiplexer

- Multichannel amplifier with modulated infrared light
- 8-channel installation system for tight assembly without cross-talk
- Automatic level control (ALC) according to assembly distance and direction
- Range up to 25 m (82 ft)
- One transistor output for each channel (npn/pnp)
- Test function to check installation and signal strength
- Switching mode light/dark selectable for each channel
- Basic transmit level selectable for each channel
- Master-Slave mode
- Transmitter and receiver connections are short-circuit proof



Description

The 8-channel automatic multiplexer from Pantron is a processor controlled amplifier with an integrated analysis unit. Up to eight transmitters and receivers can be connected to each unit without possibility of cross talk. The amplifier works with modulated infrared light which provides high immunity to ambient light. The automatic gain setting enables the user to simplify the installation and work.

For each channel, the multiplexer has one transistor output (pnp/npn) and a yellow status LED.

All channels can be switched independent from each other to different working conditions by DIP-switches. The sensitivity of the device can be switched to 4 basic transmit levels using the same method. Also, the transmitter power can be increased to optimize object recognition.

A control unit, which can be activated by simply pressing a button, is used to determine malfunctions in the transmitter or the receiver. If nothing is defective, the test function shows the signal quality. A line display shows the received signal intensity. The

more flashes received, the stronger the signal.

If more than 8 channels are required, several 8-channel automatic multiplexers or 8-channel standard multiplexers can be synchronized via master-slave operation.

An alarm display and output, which shows errors and the limit of the transmit power and is connectable with a PLC, enables users to safely work with the photo-electric multiplexer.

Ordering Guide

Model
IMX-A832I/24VDC



Safety Instructions

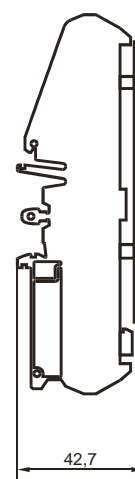
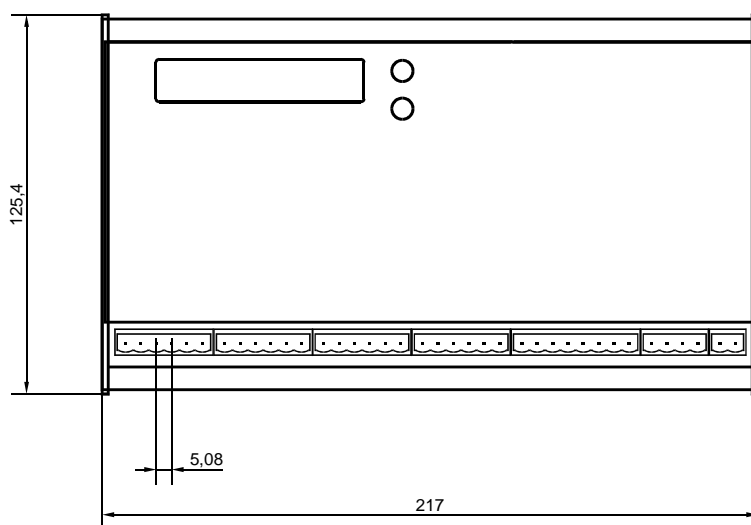
The operation of infrared multiplexer IMX... is not authorized for applications where safety of person depends on the device function.

Technical Data

Operating basis	Modulated IR-light
max. range (through beam)	
Sensors IT-P10,IR-P10	15 m
Sensors IT-P10HP,IR-P10	20 m
Output status display	8 x LED grün
Multi function display:	
Automatic function	8 x LED green
Alarm	8 x LED red
Basic transmit level	8 x LED yellow
Operation mode display:	
Normal mode	LED green
Test mode	LED yellow
Slave mode display	LED yellow
Switching function	light / dark, selectable
Slave function	yes
ALC delay	2 s
Housing	Plastic
Temperature (operation)	-25 °C ... +60 °C
Temperature (storage)	-40 °C ... +60 °C

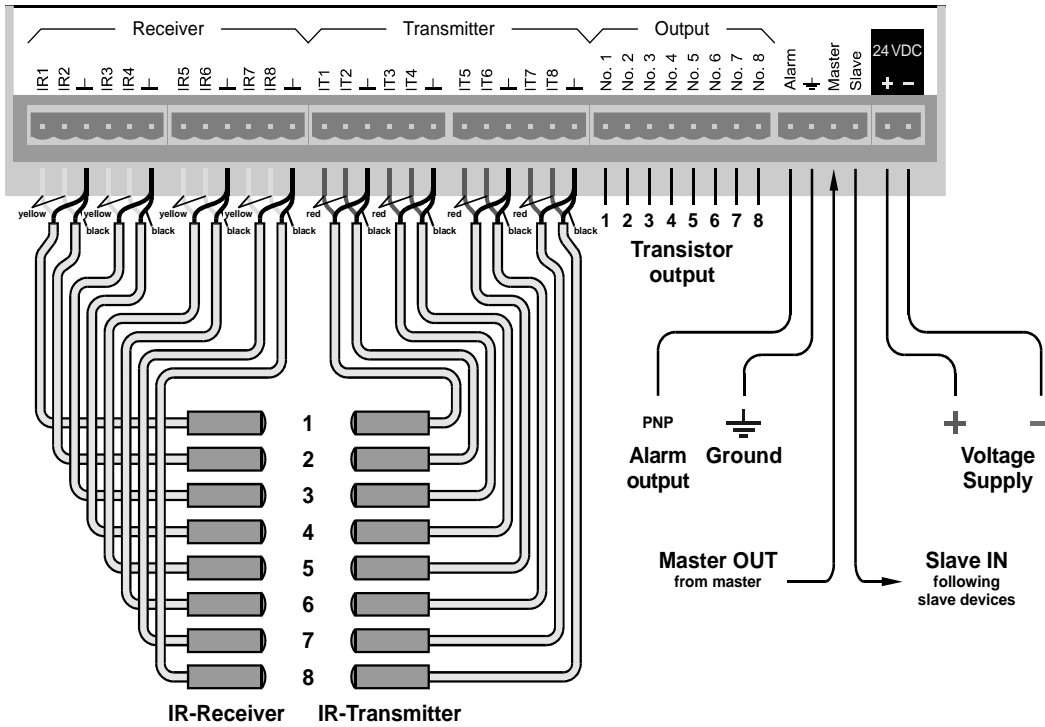
Supply voltage	24 V DC
Voltage tolerance	10 %
Power consumption	10 W
Transmit frequency	4,0 kHz
Transmit power	Automatic
Basic transmit level	Low 1/Low 2/High 1/High 2
Multiplex speed	34 ms (30 Hz)
Transistor output:	npn / pnp
Switching data (max.)	100 mA / 12 ... 30 VDC
Reaction time T _{ON} / T _{OFF}	33 ms / 33 ms
Switching frequency	15 Hz
Alarm output	pnp
Switching data	24 V DC / max. 100 mA
Connection	Strip headers RM 5,08
Mounting orientation	free
Mounting	DIN rail mounting
Size (mm)	L 217 x B 125,4 x H 42,7

Dimensions



dimensions in millimeters

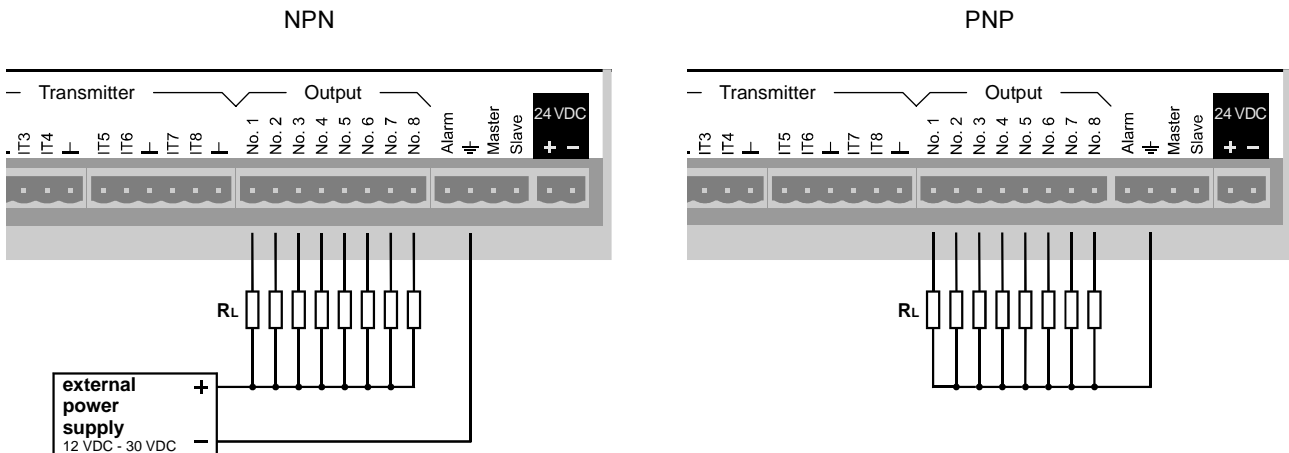
Wiring diagram



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.

Transistor output:



General Description

1. Principle of operation

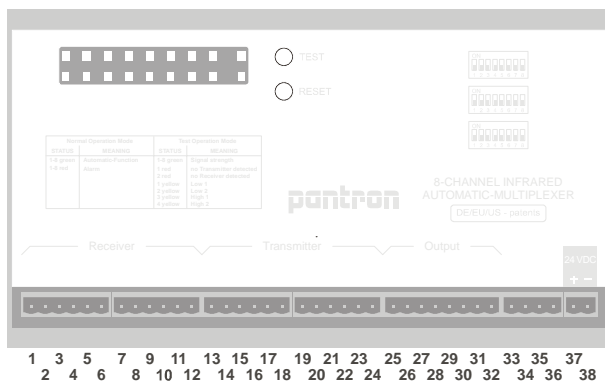
The system (consisting of transmitter, receiver and one multiplexer) works with modulated infrared light. The device activates the sensor heads cycling one after the other (multiplex operation). During the activation, the state of each channel is evaluated. According to the channel's condition, the appropriate transmit power is calculated (**A**utomatic **L**evel **C**ontrol) and the display and outputs are set.

2. Automatic level control

Automatic **L**evel **C**ontrol is the main feature of Pantron's infrared automatic multiplexer. The transmitter power level is continuously calculated to an optimal value to guarantee steady switching reaction, independent from distance between transmitter and receiver, mounting position, temperature etc.

3. Connections

Wires are connected with one row of 38 terminals (see picture 1). Phoenix contact.



picture 1: Numbers of terminals

a) Voltage Supply (V. SUPPLY)¹

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 terminal number 37 (positive) and terminal number 38 (neutral).

b) Transmitter (IT...)¹

Eight infrared transmitters can be connected to one 8-channel multiplexer. Connect the transmitter as shown in table 1.

Transmitter	Plus (red) ²	Ground (black) ²
1	No. 13	No. 15
2	No. 14	No. 15
3	No. 16	No. 18
4	No. 17	No. 18
5	No. 19	No. 21
6	No. 20	No. 21
7	No. 22	No. 24
8	No. 23	No. 24

Table 1: Transmitter terminals

c) Receiver (IR...)¹

Eight infrared receivers can be connected to one 8-channel multiplexer. Connect the receivers as shown in table 2.

Receiver	Plus (yellow) ³	Ground (shield) ³
1	No. 1	No. 3
2	No. 2	No. 3
3	No. 4	No. 6
4	No. 5	No. 6
5	No. 7	No. 9
6	No. 8	No. 9
7	No. 10	No. 12
8	No. 11	No. 12

Table 2: Receiver terminals

d) Transistor output

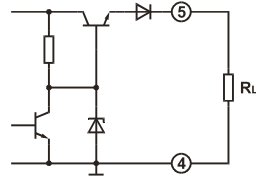
For each channel, the multiplexer has one transistor output (wiring table 3) which can be used as a pnp or npn output depending on the connection. All outputs have a common ground terminal (terminal no. 34). The maximum allowable switching current is 100 mA at 12 V DC to 30 V DC.

Channel	Transistor output
1	No. 25
2	No. 26
3	No. 27
4	No. 28
5	No. 29
6	No. 30
7	No. 31
8	No. 32

Table 3: Transistor output terminals

e) Alarm output (ALARM)¹

The alarm output has +24 V DC output voltage by alarm. The maximum load from the output is 100 mA. Connect the evaluation unit between positive (terminal number 33) and neutral (terminal number 34), see picture 2.



Picture 2: Alarm output

f) Master OUT

To synchronize more than one 8-channel multiplexer, the MASTER OUT output (connection terminal number 35, see picture 1) gives a signal to the following device.

Note: Do not connect the MASTER OUT terminal with the MASTER OUT terminal of the next device

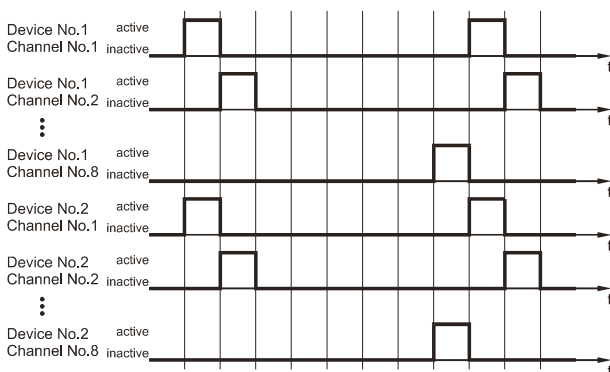
g) Slave IN

To synchronize more than one 8-channel multiplexer, the SLAVE IN input (connection terminal number 36, see picture 1) receives the signal from the previous device.

Note: The SLAVE IN terminal should be wired to a MASTER OUT terminal.

4. Master-Slave operation

The master-slave operation allows synchronized action of multiple 8 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 4). With a suitable arrangement of sensor pairs, the mutual influence between the amplifiers can be prevented.



Picture 3: Master-Slave operation

Note: Do not wire the MASTER OUT terminal from the last device with the SLAVE IN terminal from the first device.

5. Operation mode terminology

The device has 2 different operation modes:

a) Normal mode

This is the standard mode that is implemented after switching the supply voltage on, as well as after the RESET push-button has been pressed.

b) Test mode

This mode is used for the physical alignment of the sensor heads and to test the set up and wiring. The multiplexer displays the following information:

- Signal strength
- Sensor error
- selected basic transmit level

The sensor heads are activated cycling one after the other. The state of each channel will not be shown and the outputs maintain the state they are in.

6. Functions terminology

The functions of the amplifier can be switched to different working conditions. The functions are selectable by DIP-switches behind the front panel.

a) Switching mode¹

The switching mode describes the output behavior on interruption of the infrared beam. There are some differences in the light circuit (light)₁ and the dark circuit (dark)₁.

Light mode operation: The output switches to ground (terminal number 34).

Dark mode operation: The output switches to the +24 V DC.

b) Basic transmit level (transmit power)¹

The basic transmit level is the minimum transmit power level of an infrared transmitter.

Low 1: This is the standard operating mode of the automatic level control (ALC). The transmit power level is always set to the optimal value for constant high switching sensitivity.

Low 2: The multiplexer works like the Low 1 basic transmit level but the device is less sensitive.

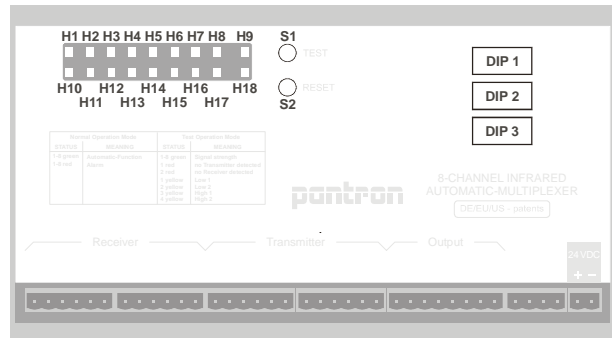
High 1: The transmit power level is always at least 50 % of the maximum power level.

High 2: The transmit power level is always at least 90 % of the maximum power level.

Operating Instructions

Display contents:

- H1 - H8: Output status indicator (yellow)
- H9: Slave mode indicator (yellow)
- H10 - H17: Multi function display (green/yellow/red)
- H18: Operation mode display (green/yellow)
- S1: Test button
- S2: Reset button
- DIP1: DIP-switch switching mode
- DIP 2 - DIP 3: DIP-switch basic transmit level



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

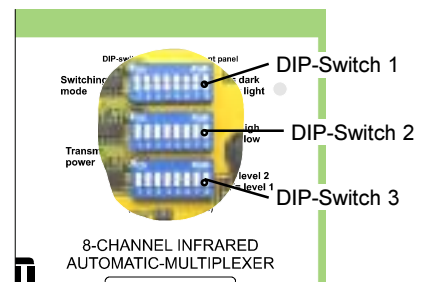
The multiplexer can be installed with two holes (DIN 46121) or a DIN rail mounting clip (DIN 46277). The wiring diagram is printed on the front label of the multiplexer or see **Wiring diagram**. For more information see **General Description**, point 3 **Connections**.

3. Choose the function

The function are selectable by three DIP-switches located behind the front panel of the photo-electric multiplexer (see picture 5). Take off the front panel to change the settings.

For complete description of function, see **General Description** point 5 **Functions Terminology**.

The allocation of the function of the DIP-switches is described in table 4. All channels can be switched independent from each other to different functions. The number of the DIP-switch is equal with the number of the transmit channel.



Picture 5: DIP-switches

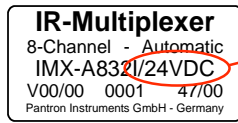
DIP-Switch 1		DIP-Switch 2		DIP-Switch 3	
switching mode ¹		transmit power			
		basic transmit level ¹		level ¹	
OFF	light ¹	OFF	Low	OFF	1
ON	dark ¹	ON	High	ON	2

Table 4: Functions

The DIP-switch settings will take effect immediately after switching on the power supply. DIP-switch settings should not be changed during operation of the multiplexer.

4. Check the supply voltage

On the right side of the multiplexer is the type plate. The supply voltage is the last two or three numbers of the part number. Check if this value is the same as the connection value.



supply voltage
for example: 24 V DC

5. Operating procedure

Switch the power supply on. The operation mode display H18 (OPERATION MODE)¹ lights green. The device is in the normal operation mode. From the normal operation mode, press S1 to enter the test mode. Pressing S2 will cause a reset equivalent to the power-on-reset.

Note: If the multi function display from one channel lights red (ALARM)¹ after switching on the power supply, the contact between transmitter and receiver from this channel is interrupted (polluted or misaligned) or the distance between the sensor heads is too far.

a) Normal mode

The operation mode display H18 lights green.

The sensor heads will be activated cycling one after the other. The information (interrupt or clearance, transmit power etc.) are evaluated and the state of the displays and transistor outputs are continuously shown. The displays H1 to H8 (OUTPUT-STATUS)¹ indicate the state of the outputs. H10 to H17 (AUTOMATIC-FUNCTION)¹ indicate the state of the Automatic Level Control. If the beam is made between the transmitter and receiver of one channel the AUTOMATIC-FUNCTION¹ LED from this channel lights green. The ALC is active and the transmit power will be turned automatically on an optimum level. If the infrared beam is interrupted, the multi function display is off and the transmit power level will be constant until the infrared beam is clear again. For description of how the device work, see table 5.

Beam status	Switching function	Output status indicator	Transistor output
	light		24 V DC
	dark		0 V
	dark		0 V
	light		24 V DC

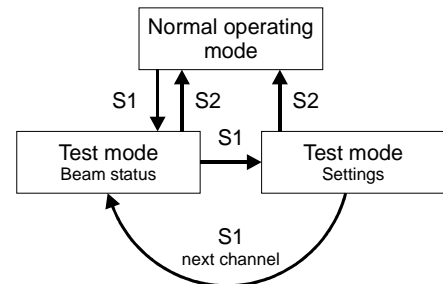
Table 5: Switching logic

After the sensor heads become polluted, the amplifier will raise the transmit power level. At 95 % of the maximum transmit power, the multi function display lights red (ALARM)¹ and the alarm output is active.

b) Test mode

The operation mode display H18 lights yellow.

This operation mode is used for the physical alignment of the sensor heads and to test the installation (wiring and setting). The sensor heads will be activated cycling one after the other. The state of the beam is not displayed. The transistor outputs maintain the state they are in. After entering the test mode only one LED from the display H1 to H8 lights and indicates the channel, which refers to the LED's from the multi function display H10 to H17 (H1 lights yellow = Information for channel 1). The multi function display shows the beam status (see below). After pressing S1 (TEST)¹ again the multi function display indicates the setting (see below). Pressing S1 (TEST) again the display indicates the information from channel 2. If the information from the last channel is displayed and after pressing S1 again the device indicates the information from channel 1 (see picture 6).



Picture 6: Over view test mode

Pressing S2 (RESET)¹ or after a few seconds without pressing the buttons, the device goes back to the normal operation mode

• Beam status

The display H10 to H17 indicates information about the beam quality, resp. errors at the sensor heads. If nothing is defective, H10 to H17 indicates the signal strength of the selected channel. The more green LED's are visible, the better the received signal is. Use this option for the mechanical alignment of your photo-eyes. One or two red LED's indicate errors in the sensor wiring:

- H10 lights red - Error at the transmitter terminal
The transmitter has a short circuit, the cable is broken or no transmitter is connected.
- H11 lights red - Error at the receiver terminal
The receiver has a short circuit, the cable is broken or no receiver is connected.

• Parameter settings

The multi function display H10 to H13 shows information about the adjusted basic transmit level. The following indicators are possible:

H10 lights yellow	-	Low 1
H11 lights yellow	-	Low 2
H12 lights yellow	-	High 1
H13 lights yellow	-	High 2

¹ Inscription front table

² Core coding transmitter cable

³ Core coding receiver cable