

Photo-electric Amplifier ISG-A113

1-channel automatic amplifier

- Amplifier with modulated infrared light
- Range up to 25 m (82 ft)
- Automatic Level Control (ALC) according to assembly distance and direction
- Two basic transmit levels
- Transistor output (npn/pnp)
- Transmitter and receiver connections are short-circuit proof
- 11-pin DIN rail mounting socket for simple installation



Description

This 1-channel automatic amplifier from Pantron has set a new standard for devices of this type. It is an amplifier with an integrated analysis unit. 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.

The amplifier can be switched to different working conditions by using a bridge at the socket. The sensitivity of the device can be switched to 2 basic transmit levels using the same method. Also, the transmitter power can be increased to optimize object recognition.

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 photoelectric amplifier.

Ordering Guide

Supply Voltage	Order no.
230VAC	ISG-A113/230VAC
115VAC	ISG-A113/115VAC
24VAC	ISG-A113/24VAC
24VDC	ISG-A113/24VDC



Safety Instructions

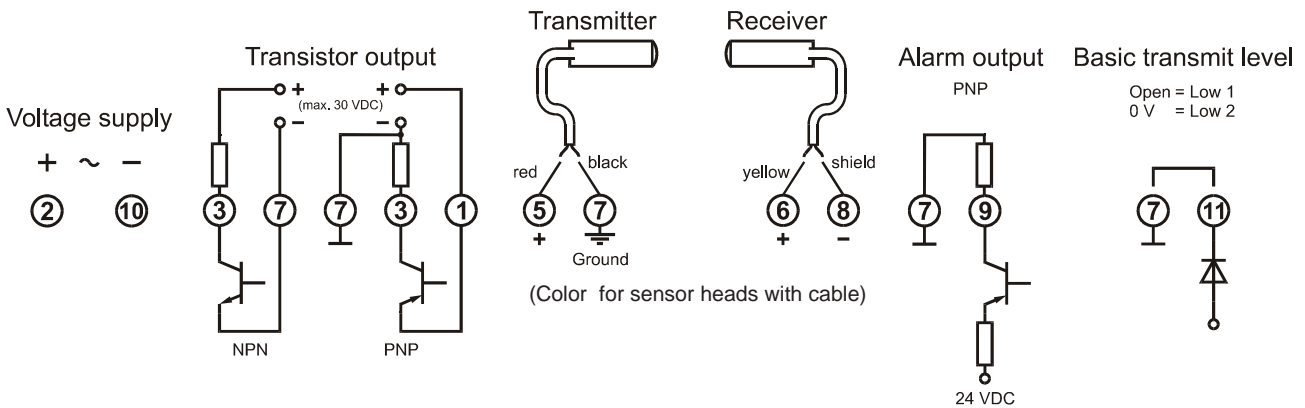
The operation of infrared amplifier ISG... is not authorized for applications where safety of the person depends on the device function.

Technical Data

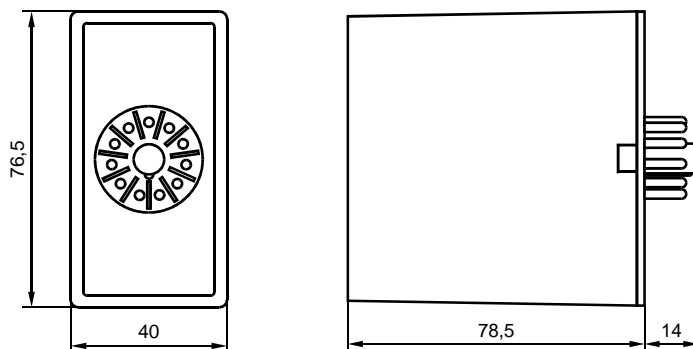
Operating basis	Modulated IR-light
Max. Range (through beam)	
Sensor heads Standard	15 m (49 ft)
Sensor heads High Power	25 m (82 ft)
Displays:	
Switching status	LED yellow
ALC	LED green
Alarm	LED red
Frequency	-
Basic transmit level	2 x LED green
Switching function	
Switching function	Light
Switching delay	
Switching delay	No
ALC delay	No
Housing	
Housing	Plastic
Housing protection	IP 40
Temperature (operation)	-25 °C ... +60 °C
Temperature (storage)	-40 °C ... +80 °C

Supply voltage	230 V AC, 115 V AC, 24 V AC, 24 V DC
Voltage tolerance	10 %
Power consumption	AC: 2,1 VA; DC: 2,2W
Transmit frequency	
Transmit frequency	3,9 kHz
Transmit power	Automatic
Basic transmit level	Low 1/ Low 2
Transistor output:	
Transistor output:	npn/pnp
Switching data (max.)	100 mA / 30 V DC
Reaction time T_{ON} / T_{OFF}	Low 1: 25 ms / 25 ms High 1: 80 ms / 15 ms
Alarm output:	
Alarm output:	pnp
Switching data (max.)	24 V DC / max. 5 mA
Test input	
Test input	No
Mounting orientation	
Mounting orientation	Free
Mounting	11-pin DIN-socket
Size (mm)	40 x 76,5 x 78,5

Wiring diagram



Dimensions



Dimensions in mm

General Description

1. Principle of operation

The system (consisting of one transmitter, one receiver and one amplifier) works with modulated infrared light. According to the channel condition, the appropriate transmit power is calculated (**A**utomatic **L**evel **C**ontrol) and the display and outputs are set.

2. Automatic Level Control

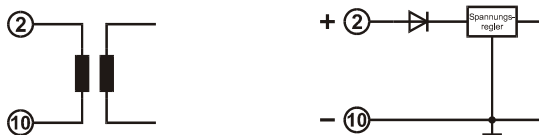
Automatic **L**evel **C**ontrol is the main feature of Pantron's infrared automatic amplifier. The transmitter power level is continuously calculated to an optimal value to guarantee steady switching reaction, independent from the distance between transmitter and receiver, mounting position, temperature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

3. Connections

The amplifier is connected with an 11-pin DIN mounting socket.

a) Power Supply (POWER)¹

Before connecting the amplifier, look on the bottom and check if the power supply is the same as the connection value. The power supply will be connected on PIN 2 and PIN 10. For devices with direct current, PIN 2 is positive and PIN 10 is neutral (see picture 1).



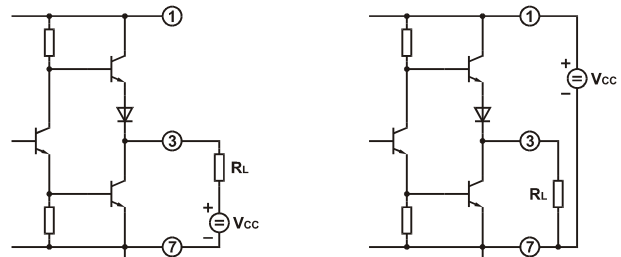
picture 1: left: AC-Connection; right: DC-Connection

CAUTION!

The AC-supply devices are isolated from main. A grounded connection on the low voltage side is required (PIN 7).

b) Transistor output¹

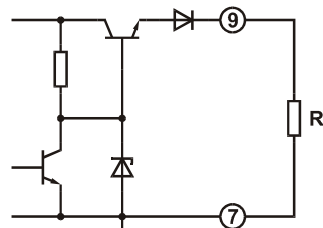
The amplifier has one transistor output (PIN 3) which can be used as pnp or npn outputs depending on the connection (see picture 2). The maximum allowable switching data is 30 V DC / 100 mA.



picture 2: Transistor output

c) Alarm output (ALARM)¹

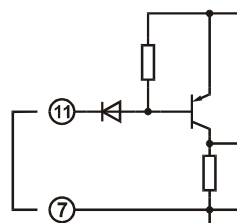
The Alarm output has 24 V DC output voltage and a maximum current value from 5 mA. To evaluate the signal connect the evaluation unit between positive (PIN 9) and neutral (PIN 7), see picture 3.



picture 3: Alarm output

d) Basic transmit level¹

The PIN 11 enables to change the basic transmit level from low 1 to low 2. To activate the low 2 level, connect the input (PIN 11) to ground (PIN 7), see picture 4.



picture 4: Basic transmit level

Note: The voltage on PIN 11 should not be higher than +30 V DC or lower than -12 V DC. If the voltage is lower than +3 V DC, the input is active.

4. Functions terminology

With the functions the amplifier can be switched to different working conditions. The functions are selected by PIN 11 of the amplifier.

a) Basic transmit level (transmit power)^{1 2}

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 amplifier works like the Low 1 basic transmit level but the device is less sensitive.

b) Switching mode¹

The switching function describes the output behavior on interruption of the infrared beam. There are only one type of switching functions:

Light mode operation: the output switch to ground (PIN 3 → PIN 7).

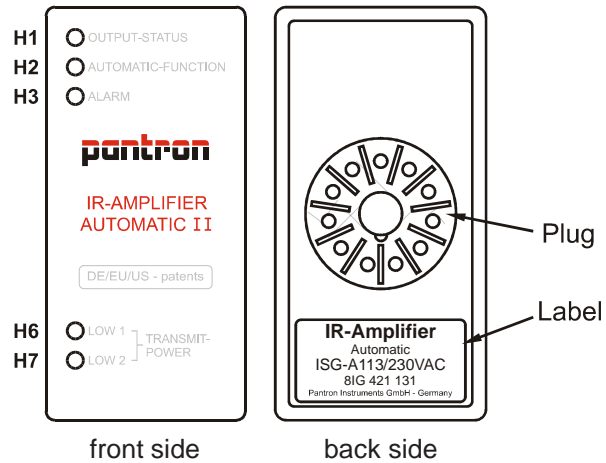
¹ Inscription side label

² Inscription front label

Operating Instructions

Display contents:

- H1: Output status indicator (yellow)
- H2: ALS display (green)
- H3: Alarm display (red)
- H6 and H7: Basic transmit level display (green)



1. Choose the sensor heads

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

2. Connect wiring to the socket

The amplifier is designed for simple installation. An 11-pin socket must be used for installation. The wiring diagram is printed on the side label from the amplifier or see **Wiring diagram**. For more information see **General Description** point 3 **Connections**.

3. Choose the function

For complete description of function, see **General Description** point 4 **Functions terminology**.

4. Check the supply voltage

On the bottom of the amplifier 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.



5. Operating procedure

Plug the amplifier into the socket and switch the power supply on. If the beam is made between the transmitter and receiver after the LED test (all LED are going on and off) the LED H2 (AUTOMATIC-FUNCTION)² 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 green LED H2 (AUTOMATC-FUNCTION)² is off and the transmit power level will be constant until the infrared beam is clear again. For a description of how the devices work, see table 2

Beam status	Switching mode	Output status indicator H1	Transistor output
	light		npn: open pnp: pnp+
	dark		npn: 0V pnp: open
	light		npn: 0V pnp: open
	dark		npn: open pnp: pnp+

Table 2: Switching logic

After the sensor heads become polluted, the amplifier will raise the transmit power level. At 95 % of the maximum transmit power, the red alarm display H3 (ALARM)² lights and the alarm output is active.

Note: If the LED H3 (ALARM)² lights red after switching on the power supply, the contact between transmitter and receiver is interrupted or the distance between the sensor heads is too far.

¹ Inscription side label

² Inscription front label