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Pantron Infrared Photoelectric Sensor Catalog





Product Overview

Pantron photoelectric systems are designed specifically for harsh environment applications to provide maximum penetration in areas where steam, oil, grease, dust, dirt, soap, fog, and other contaminants cause significant problems for ordinary photoelectric sensors.

A wide variety of amplifiers and multiplexers (multi-channel amplifiers) are available with features including manual or automatic gain adjustment, relay or transistor outputs, time delay, and self-diagnostic features. Multiplexers are designed to control 2, 4, or 8 sets of photo eyes at one time with no cross-talk. The 4 and 8 channel multiplexers offer an interface to connect additional Pantron multiplexers for the synchronization of even more sets of photo eyes.

New adjustable fork light barriers from Pantron provide a combination of features including an adjustable fork width, a programmable teach mode, and a new PC interface! Setup, monitor, and change the settings of the fork light barrier in real time from a computer using free WinConnect software from Pantron.

Information About Pantron Automation, Inc.

Pantron Automation, Inc. is the North American distributor for Pantron Instruments, GmbH and is located in Belmont, NC, just several miles from the Charlotte Douglas Airport. Office hours are **Monday through Friday**, 8:00 am until 5:00 PM EST. Call or visit Pantron Automation's website for sales, technical support, and application assistance.

Safety Instructions:



The devices manufactured by Pantron Instruments, GmbH are not to be used for applications where personal safety is dependent on their function.

Approvals:



All technical specifications included herein refer to the state of the art 1/2012. They are subject to modifications.

Applications for Pantron Sensors

Two sets of Pantron photo eyes configured in through-beam mode and connected to a 2-channel IMX-N24 multiplexer set for automatic gain control. Used in a vehicle wash to detect cars, trucks, trains, or buses.	One set of Pantron photo eyes configured in through-beam mode and connected to a single-channel manual ISG-N34 ampli- fier. Used for operating automatic over- head doors for vehicles.
One set of Pantron photo eyes configured in diffuse proximity mode and connected to a single-channel automatic ISG-A124 amplifier. Used when wiring to both sides is not possible.	One set of Pantron photo eyes configured in through-beam mode and connected to a single-channel manual ISG-N24 ampli- fier. Used for detecting bags of cement on a conveyor in an extremely dusty en- vironment.
One set of Pantron photo eyes configured in retro-reflective mode using an external reflector and connected to a single-channel manual ISM-1000 amplifier. Used for detecting packages and parts on a conveyor in a clean environment.	One set of Pantron photo eyes configured in through-beam mode and connected to a single-channel manual ISG-N34 ampli- fier. Used to detect the absolute level of bulk material in a tank.
Four sets of Pantron photo eyes configured in through-beam mode and connected to an ISM-4000 multiplexer. The ISM-4000 may be programmed to simulate a light curtain. Used to detect logs, no matter the size in a harsh environment.	Pantron adjustable fork light barrier used to detect misaligned caps on bottles. Fork may be adjusted to various widths to accommodate different sizes of bottles.

Components of a Pantron Photoelectric System



Single set of photo eyes

Example set consists of:

- qty 1 ISG-A124-115VAC Infrared amplifier
- qty 1 IT-M12-15M Infrared transmitter eye
- qty 1 IR-M12-15M Infrared receiver eye
- qty 1 MB11 11 pin amplifier socket
- qty 1 PanBox 1x1 protective enclosure

Applications:

- Detect automobile to engage wash equipment
- Level detection of material in a bin
- Presence detection on a conveyor

Two sets of photo eyes

Example set consists of:

- qty 1 IMX-N34-24VAC Infrared multiplexer w/ time delay
- qty 2 IT-M12-15M Infrared transmitter eye
- qty 2 IR-M12-15M Infrared receiver eye
- qty 1 MB11 11 pin amplifier socket
- qty 1 PanBox 1x1 protective enclosure

Applications:

- High/low level applications
- Open and close automatic rollover doors
- Product sorting and dry filling

Four sets of photo eyes

Example set consists of:

- qty 1 ISM-4000-24VDC Infrared multiplexer
- qty 4 IT-M12-15M Infrared transmitter eye
- qty 4 IR-M12-15M Infrared receiver eye
- qty 1 PanBox 1x4 protective enclosure

Applications:

- Control car wash equipment
- Height detection of objects on a conveyor
- Simulated light curtain
- Sorting / stacking / indexing

Eight sets of photo eyes

Example set consists of:

- qty 1 ISM-8000-24VDC Infrared multiplexer
- qty 8 ITA-CLN-15 High-powered infrared transmitter eye
- qty 8 IR-M12-15M Infrared receiver eye
- qty 1 PanBox 1x8 protective enclosure

Applications:

- Control truck / train wash equipment
- Simulated light curtain
- Level detection











Infrared Photo Eyes (compatible with all Pantron amplifiers and multiplexers)

Transmitter	Transmitter	Transmitter					
IT, ITL	ITHP, ITH	ITA	Receiver	Connection	Material	Picture	
IT-P10-5m	IT-P10HP-5m	ITA-TLP-5	IR-P10-5m	cable 5m*			
IT-P10-15m	IT-P10HP-15m	ITA-TLP-15	IR-P10-15m	cable 15m*	plastic		
IT-P10-3QD	IT-P10HP-3QD	ITA-TLP-B3	IR-P10-3QD	plug M8	plastic		
IT-M12-5m	IT-M12HP-5m	ITA-CLN-5	IR-M12-5m	cable 5m*	nickel-plated brass		
IT-M12-15m	IT-M12HP-15m	ITA-CLN-15	IR-M12-15m	cable 15m*			
IT-M12VA-5m IT-M12VA-15m	IT-M12VAHP-5m IT-M12\/AHP-15m	ITA-CLV-5	IR-M12VA-5m IR-M12VA-15m	cable 5m [*]	stainless steel		
IT-M12-3QD	IT-M12HP-3QD	ITA-CLN-B3	IR-M12-3QD	plug M8	nickel-plated brass		
IT-M12VA-3QD	IT-M12VAHP-3QD	ITA-CLV-B3	IR-M12VA-3QD	plug M8	stainless steel		
IT-M12-4QD	IT-M12HP-4QD	ITA-CLN-C4	IR-M12-4QD	plug M12	nickel-plated brass		
IT-M12VA-4QD	IT-M12VAHP-4QD	ITA-CLV-C4	IR-M12VA-4QD	plug M12	stainless steel		
IT-AS-5m				cable 5m*	nlastic		
IT-AS-15m				cable 15m*	plastic		
			IR-AS-5m	cable 5m*	nlastic		
			IR-AS-15m	cable 15m*	plastic		
IT-AS-3QD				plug M8	plastic		
			IR-AS-3QD	plug M8	plastic		
IT-SLA-5m	IT-SLAHP-5m	ITA-LLA-5	IR-SLA-5m	cable 5m*	oluminum		
IT-SLA-15m	IT-SLAHP-15m	ITA-LLA-15	IR-SLA-15m	cable 15m*	aiuminum		
IT-SLA-3QD	IT-SLAHP-3QD	ITA-LLA-B3	IR-SLA-3QD	plug M8	aluminum	• • • •	
ITL-TSP-5	ITH-TSP-5	ITA-TSP-5	IRL-TSP-5	cable 5m*			
ITL-TSP-15	ITH-TSP-15	ITA-TSP-15	IRL-TSP-15	cable 15m*	plastic		
ITL-TSP-B3	ITH-TSP-B3	ITA-TSP-B3	IRL-TSP-B3	plug M8	plastic		
ITL-SSP-5	ITH-SSP-5	ITA-SSP-5	IRL-SSP-5	cable 5m*			
ITL-SSP-15	ITH-SSP-15	ITA-SSP-15	IRL-SSP-15	cable 15m*	plastic	A REAL PROPERTY AND A REAL	
ITL-SSP-B3	ITH-SSP-B3	ITA-SSP-B3	IRL-SSP-B3	plug M8	plastic		
ITL-CSN-5	ITH-CSN-5	ITA-CSN-5	IRL-CSN-5	cable 5m*	nickel-plated brass	aŭ	
ITL-CSN-15	ITH-CSN-15	ITA-CSN-15	IRL-CSN-15	cable 15m*			
IIL-05V-5	ITH-09V-5	ITA-05V-5	IRL-03V-5	cable 15m*	stainless steel	- Mil	
ITL-CSN-B3	ITH-CSN-B3	ITA-CSV-15	IRL-CSV-15	plug M8	nickel-plated brass		
ITL-CSV-B3	ITH-CSV-B3	ITA-CSV-B3	IRL-CSV-B3	plug M8	stainless steel		
ITL-CSN-C4	ITH-CSN-C4	ITA-CSN-C4	IRL-CSN-C4	plug M12	nickel-plated brass		
ITL-CSV-C4	ITH-CSV-C4	ITA-CSV-C4	IRL-CSV-C4	plug M12	stainless steel		
J			•				

4 * Other cable lengths by request.



Photo Eye Information

The design of Pantron photo eyes is crucial to their performance. The lens that is used to focus the infrared beam is contained deep within the protective housing of the photo eye. This prevents it from becoming scratched or dirty. The piece on the front of the photo eye that resembles a lens is actually an extremely durable protective shield made of Lexan TM polycarbonate resin*. When the infrared beam is created, it is focused within the photo eye and then passes through the external shield. Using this method, the photo eye is capable of producing a beam that is extremely powerful.

Pantron photoelectric systems are perfect for wash-down areas, carwashes, and amusement park water rides because they have a protection rating of IP67 and are 100% submersible. Pantron photo eyes are available in both hard-wired and quick disconnect versions. The hard-wired photo eyes are fitted with a color-coded strain relief at the point where the cable connects to the body. This reduces the stress applied to the connection between the wire and the photo eye and provides a method for easy identification of the transmitter (red) and the receiver (black.)

Technical Data for Pant at +68°F	tron Photo Eyes			
Ambient temperature		- 13° F	. +149° F	
Storage temperature		- 40° F	. +176° F	
Vibration		10 55 H	z, 1.5 m m	
Shock		30	g	
Protection class		IP	67	
Transmitter				
Туре	IT or ITL	ITHP	or ITH	ITA
Transmit light	Infrared 880 nm, modulated	Infrared 870 n	m, modulated	Infrared 870 nm, modulated
Transmit power	40 mW/sr	70 m	N/sr	350 mW / sr
Opening angle	10°	2	0°	6°
Cable sheathing		PVC, 03.8 mm +	/- 0.2 mm, black	
Cable core construction		2x 0.25 mm ²	, red / black	
Receiver				
Туре	IRL			IR
Opening angle	25°		25°	
Ambient light immunity	40000 LUX 60000 LUX			
Cable sheathing		PVC, 03.8 mm +	/- 0.2 mm, black	
Cable core construction		1x 0.34 mm2, y	ellow shielded	

Range Overview (combination of photo eyes with various amplifiers and multiplexers)

			Photo eye type						
			Transmitter	IT o	r ITL	ITHP or ITH		ITA	
			Receiver	IRL	IR	IRL	IR	IRL	IR
	S	ISM-1200		7m	15m	10m	25m	20m	55m
ype	Serie	ISM-2000		8m	20m	10m	30m	20m	55m
ert	≥ S	ISM-4000		10m	15m	12m	25m	25m	60m
lex	IS	ISM-8000		10m	15m	12m	25m	25m	60m
Iltip	S	ISG-N24		20m	25m	30m	35m	50m	70m
, mu	erie	ISG-N34		20m	25m	30m	35m	50m	70m
ier/	G-S	ISG-A124		7m	15m	10m	25m	20m	50m
plifi	IS	ISG-A134		7m	15m	10m	25m	20m	50m
Am	1X ies	IMX-N24		10m	20m	15m	30m	25m	50m
	IN Seri	IMX-N34		10m	20m	15m	30m	25m	50m

* Lexan is a registered trademark for SABIC Innovative Plastics



Infrared Amplifier and Multiplexer Selection Guide

Number of channels - The number of sets of photo eyes (transmitter and receiver) that may be controlled at once by the device. Switching mode - In "dark" mode, output occurs when the beam is interrupted. In "light" mode, output occurs when the beam is not interrupted. Number of frequencies - The frequency of the infrared beam emitted by the transmitter may be changed in order to distinguish sets of photo eyes from one another, which eliminates crosstalk.

Built-in diagnostics - A diagnostic mode that may be used to correct problems with the photo eyes.

Transistor or relay outputs - The output from the Pantron device that interfaces with external equipment.

Alarm output - This output signal may be used to alert an operator that the Pantron device is operating at maximum capacity.

Basic transmit levels - The available overall system power may be adjusted in 25% increments to control the power of the infrared beam. **Automatic gain control** - These devices will automatically adjust the system gain to compensate for contaminates on the face of the photo eyes.

	Part #	Number of channels	Switching mode light / dark / both	Number of frequencies	Built-in diagnostics	Switching delay	Test imput	Transistor output	Relay output	Alarm output	Basic transmit levels	Automatic gain control
	ISG-N24	1	B	4			•	•	•		2	
	ISG-N34	1	В	4		•	•	•	•		2	
	ISG-A102	1	B	2	•		•		•	•	4	•
ier	ISG-A124	1	В	2	•		•		•	•	4	•
lifi	ISG-A133	1	В	2	•	•	•	•		•	4	•
lqı	ISG-A134	1	В	2	•	•	•		•	•	4	•
MM	ISM-1000	1	L	1			•		•		1	
\checkmark	ISM-1100	1	В	4			•		•	•	2	
	ISM-1200	1	B	2	•		•		•	•	2	•
	ISM-1220	1	В	2	•	•	•		•	•	2	•
	IMX-N23	2	В	1				•			2	
	IMX-N24	2	В	1					•		2	
	IMX-N33	2	B	1		•		•			2	
*	IMX-N34	2	В	1		•			•		2	
	IMX-N430	4	В	1		•		•			2	
(er	IMX-N440	4	В	1		•			•		2	
lex	IMX-N830	8	В	1		•		•			2	
ipl	IMX-N840	8	В	1		•			•		2	
lt	IMX-A830	8	В	1	•	•		•		•	2	•
U u	IMX-A831	8	В	1	•			•		•	2	•
	IMX-A832	8	В	1	•			•		•	4	•
	IMX-A840	8	В	1	•	•			•	•	2	•
	IMX-A841	8	В	1	•				•	•	2	•
	IMX-A842	8	В	1	•				•	٠	4	•
	ISM-2000	2	В	1	•				•	•	2	•
	ISM-4000	4	В	1	•				•	•	4	•
	ISM-8000	8	В	1	•				•	•	4	•

* IMX series multiplexers are not shown in this publication. Please visit www.pantron.com/us for more details.

Infrared Amplifier Information





There are two types of Pantron amplifiers, manual, (ex. model ISG-N24), which allows the user to manually adjust the gain setting, and automatic amplifiers, (ex. model ISG-A124.) The amplifier is the controller for the Pantron photo eyes and plugs into an 11-pin socket. The transmitter and receiver photo eyes connect to this socket as well as the power supply for the amplifier and the output connections for the equipment to be controlled.

The amplifier sends a modulated signal to the transmitter photo eye. The transmitter converts this signal into an infrared beam of light, which is projected up to 100 feet. The intensity of the infrared beam may be controlled to compensate for the environmental conditions of different applications. In a car wash, for example, the intensity of the beam should be strong to penetrate the spray, soap, dirt, and fog. In an application where smaller objects are being detected, for instance, on a

conveyor, the intensity of the beam should be lower so that the beam does not illuminate the object and pass around the sides. The receiver photo eye detects this infrared beam of light and returns a signal to the amplifier. If the signal returned to the amplifier matches the correct frequency, then the amplifier reports that the photo eyes have visual contact. Incorrect frequencies are ignored, which is helpful in reducing false signals due to extraneous light sources.

On the back of the amplifiers, in addition to the quick disconnect pins, there is a bank of four Dipswitches. These switches are used to set the features previously described. These settings vary based upon the model of amplifier being used. When setting a Pantron automatic amplifier, the first two Dipswitches are used together to control the level of intensity of the infrared beam. The third Dipswitch controls a feature known as light and dark mode. If dark mode is selected, the amplifier will register an output when the infrared beam is interrupted. If light mode is selected, the output will remain ON until the beam is interrupted. The fourth Dipswitch selects the frequency that the transmitter will use to transmit its beam.



Pantron automatic amplifiers (ISG-Axx) have a special diagnostic function that enables a user to troubleshoot the photo eyes without technical assistance. The button on the face of the amplifier, when held for two seconds causes the amplifier to reset, but when it is only pushed briefly, it causes the amplifier to enter diagnostic mode. In diagnostic mode, the text on the right-hand side of the face of the amplifier is used as a reference to interpret the amplifier's report, which is delivered through a series of flashing LED's. Most Pantron manual amplifiers (ISG-Nxx) do not include a diagnostic mode.



ISG-A124 series automatic amplifier

How to Use Diagnostic / Test Mode

To put amplifier into test mode, briefly press the Reset/Test Mode button and let it go. Holding this button will result in a full reset. If the following LED's flash, please note the instructions included:

No Signal Error: If the yellow OUTPUT STATUS LED flashes **with** the Alarm LED, the transmitter or receiver is either out of alignment or there is an obstruction preventing the two eyes from seeing each other. Aclear signal should be possible if the photo eyes and their cables are not damaged.

Signal Strength: If the green AUTOMATIC FUNCTION LED blinks by itself, the eyes can see each other and the number of blinks shows the strength of the infrared beam. (1 blink signifies the weakest beam and 10 is the strongest). If the signal strength is low, try cleaning the face of the photo eye and realign them.

Transmitter Fail Error: If the **upper** yellow TRANSMIT CHANNEL LED blinks **with** the redAlarm LED, watch how fast it blinks. If it blinks *faster* than the Alarm LED, there is a short on the transmitter side. Check your cable connections to make sure they are correct. If it blinks the *same slow speed* as the Alarm LED, there is an open on the transmitter side. Check the cable, first where it connects to the amplifier, and second in any areas where the cable is exposed or where there are splices.

Receiver Fail Error: If the **lower** yellow TRANSMIT CHANNEL LED blinks **with** the redAlarm LED, watch how fast it blinks. If it blinks *faster* than the Alarm LED, there is a short on the receiver side. Check your cable connections to make sure they are correct. If it blinks the *same slow speed* as the Alarm LED, there is an open on the receiver side. Check the cable, first where it connects to the amplifier, and second in any areas where the cable is exposed or where there are splices.



Infrared Amplifier Specifications (ISG Series)

ISG-N24-* (single channel, manual gain)

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OUTPUT-

ALARM

> PUN **IR-AM** AUTON DE/EU/U

> > CHANNE TRANS LEVEL

	Technical Data for ISC	G-N24
OUTPUT/RELAY-STATUS	at +68°F	
	Max. range (through beam)	
SAIN-CONTROL	Sensors IT-P10, IR-P10	25 m (82ft)
	Sensors IT-P10HP, IR-P10	35 m (115ft)
	Supply voltage	purchase order table below
	Operating basis	modulated IR light
ontron I	Transmit frequency	3.5 / 3.8 / 4.0 / 4.5
	Switching mode	light / dark switchable
R-AMPLIFIER	System power	20% / 100%, switchable
	Switching delay	-
	Relay output	changeover, 5 A / 230 VAC
	Switching frequency	18 Hz
	Transistor output DC:	npn / pnp, 100 m A (30 VDC)
4 5 6	AC:	npn, 30 mA / pnp, 5 mA (12
3, 1, 7	Switching frequency	30 Hz
8	Housing material	plastic
- F9	Protection class	IP 40
10	Operating temperature	-13°F +140°F
GAIN-SETTING	Purchase order table	
	Supply voltage	Model
	230 VAC / +/- 10% / 2.4 VA	ISG-N24/230 VAC
	115 VAC / +/- 10% / 2.4 VA	ISG-N24/115 VAC
	24 VAC / +/- 10% / 2.4 VA	ISG-N24/24 VAC
	24 VDC / +/- 20% / 2.0 W	ISG-N24/24 VDC

ISG-A124-* (single channel, automatic gain)

0		
	Technical Data for ISC	G-A124
	at +68°F	
	Max. range (through beam)	
H	Sensors IT-P10, IR-P10	15 m (49ft)
	Sensors IT-P10HP, IR-P10	25 m (82ft)
	Supply voltage	purchase order table below
	Operating basis	modulated IR light
	Transmit power	automatic adjustment
	Transmit frequency	3.7 kHz / 4.1 kHz, switchable
	Switching mode	light / dark switchable
	Basic transmit level	low 1 / low 2 / high 1 / high 2
	Switching delay	-
	Relay output	1 changeover
	Maximum load	5 A / 230 VAC (24 VDC)
	Switching frequency	20 Hz (low) / 11 Hz (high)
	Alarm output	pnp, 24 VDC
	Maximum load	AC: 5 mA, DC: 100 mA
	Test input	0 30 VDC
	Housing material	plastic
	Protection class	IP 40
	Operating temperature	-13°C +140°C
	Purchase order table	Model
	Supply voltage	Model
	230 VAC / +/- 10% / 2.4 VA	ISG-A124/230 VAC
	115 VAC / +/- 10% / 2.4 VA	ISG-A124/115 VAC
	24 VAC / +/- 10% / 2.4 VA	ISG-A124/24 VAC

OUTPUT/RELAY-STATU

GAIN-CONTROL pantron

IR-AMPLIFIER t - ON TIMER (0 - 10 sec.

t - OFF

ON GAIN-SETTING

OUTPUT-STATUS

pun R-AN

ISG-N34-* (single channel, manual gain, time delay)

Technical Data for ISG-N34

at +68°F	
Max. range (through beam)	
Sensors IT-P10, IR-P10	25 m (82ft)
Sensors IT-P10HP, IR-P10	35 m (115ft)
Supply voltage	purchase order table below
Operating basis	modulated IR light
Transmit frequency	3.5 / 3.8 / 4.0 / 4.5
Switching mode	light / dark switchable
System power	20% / 100% switchable
Switching delay	0 10 s
Relay output	changeover, 5 A / 230 VAC
Switching frequency	12 Hz
Transistor output DC:	npn / pnp, 100 mA (30 VDC)
AC:	npn, 30 m A /pnp, 5 m A (12 VDC)
Switching frequency	20 Hz
Housing material	plastic
Protection class	IP 40
Operating temperature	-13°F +140°C
Purchase order table	Madal
Supply voltage	Woder
230 VAC / +/- 10% / 2.4 VA	ISG-N34/230 VAC
115 VAC / +/- 10% / 2.4 VA	ISG-N34/115 VAC
24 VAC / +/- 10% / 2.4 VA	ISG-N34/24 VAC
24 VDC / +/- 20% / 2.0 W	ISG-N34/24 VDC
	at +68°F Max. range (through beam) Sensors IT-P10, IR-P10 Sensors IT-P10, IR-P10 Supply voltage Operating basis Transmit frequency Switching mode System power Switching frequency Transistor output Switching frequency Housing material Protection class Operating temperature Purchase order table Supply voltage 230 VAC /+/- 10% / 2.4 VA 24 VAC /+/- 10% / 2.4 VA 24 VAC /+/- 20% / 2.0 W

ISG-A134-* (single channel, automatic gain, time delay)

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	Technical Data for ISC	G-A134
	at +68°F	
SIGNAL	Max. Range (through beam)	
STRENGTH	Sensors IT-P10, IR-P10	15 m (49ft)
ERROR	Sensors IT-P10HP, IR-P10	25 m (82ft)
tron I	Supply voltage	purchase order table below
AUTOMATIC II	Operating basis	modulated IR light
IS - patents	Transmit power	automatic adjustment
-ON	Transmit frequency	3.7 kHz / 4.1 kHz, switchable
	Switching mode	light / dark switchable
(0 - 10 sec.)	Basic transmit level	low 1 / low 2 / high 1 / high 2
OFF	Switching delay	0 10 s
	Relay output	1 changeover
TRANSMITTER FAIL	Maximum load	5 A / 230 VAC (24 VDC)
RECEIVER	Switching frequency	20 Hz (low) / 11 Hz (high)
FAIL	Alarm output	pnp, 24 VDC
⊃LOW ■≪HIGH	Maximum load	AC: 5 mA, DC: 100 mA
I	Test input	0 30 VDC
TEST MODE	Housing material	plastic
L RESET	Protection class	IP 40
	Operating temperature	-13°F +140°F
	Purchase order table	Medel
	Supply voltage	Model
	230 VAC / +/- 10% / 2.4 VA	ISG-A134/230 VAC
	115 VAC / +/- 10% / 2.4 VA	ISG-A134/115 VAC
	24 VAC / +/- 10% / 2.4 VA	ISG-A134/24 VAC
	24 VDC / +/- 20% / 2.0 W	ISG-A134/24 VDC





Infrared Multiplexer Specifications (IMX Series)

IMX-N24-* (two-channel, manual gain) Technical Data for IMX-N24 at +68°F POWER ON POWER ON Max. range (through beam) OUTPUT 1 -STATUS OUTPUT 1 -STATUS Sensors IT-P10, IR-P10 25 m (82ft) Sensors IT-P10HP, IR-P10 35 m (115ft) GAIN 1 -CONTROL GAIN 1 -CONTROL Supply voltage purchase order table below t-O pantron Operating basis modulated IR light pantron TIM Transmit frequency 4.0 kHz Switching mode light / dark switchable GAIN 1 t-O System power low / high, switchable Switching delay (0 - 10 ()2x normally open Relay output GAIN 2 GAIN 2 t-O max. operation value 5 A / 230 V AC (24 VDC) Multiplex speed 8 ms (16 ms): TIM reaction time **IR-AMPLIFIER** 16 m s (32 m s) **IR-AMPLIFIER** t-O Alarm output Housing material OUTPUT 2 -STATUS plastic OUTPUT 2 -STATUS IP 40 Protection class GAIN 2 -CONTROL GAIN 2 -CONTROL Operating temperature -13°F +140°F Purchase order table MULTIPLEXED 2-CHANNEL MULTIPLEXED 2-CHANNE Model Supply voltage 230 VAC / +/- 10% / 2.4 VA IMX-N24/230 VAC 115 VAC / +/- 10% / 2.4 VA IMX-N24/115 VAC 24 VAC / +/- 10% / 2.4 VA IMX-N24/24 VAC 24 VDC / +/- 20% / 2.0 W IMX-N24/24 VDC

IMX-N34-* (two-channel, manual gain, time delay)

	Technical Data for ISC	Technical Data for ISG-N34				
	at +68°F					
	Max. range (through beam)					
	Sensors IT-P10, IR-P10	25 m (82ft)				
	Sensors IT-P10HP, IR-P10	35 m (115ft)				
N	Supply voltage	purchase order table below				
	Operating basis	modulated IR light				
ER 1	Transmit frequency	3.5 / 3.8 / 4.0 / 4.5				
FF	Switching mode	light / dark switchable				
	System power	20% / 100% switchable				
sec.)	Switching delay	0 10 s				
	Relay output	changeover, 5 A / 230 VAC				
N	Switching frequency	12 Hz				
ER 2	Transistor output DC:	npn / pnp, 100 mA (30 VDC)				
	AC:	npn, 30 m A /pnp, 5 m A (12 VDC)				
FF	Switching frequency	20 Hz				
	Housing material	plastic				
	Protection class	IP 40				
	Operating temperature	-13°F +140°C				
EL	Purchase order table	Model				
	Supply voltage	Woder				
	230 VAC / +/- 10% / 2.4 VA	ISG-N34/230 VAC				
	115 VAC / +/- 10% / 2.4 VA	ISG-N34/115 VAC				
	24 VAC / +/- 10% / 2.4 VA	ISG-N34/24 VAC				
	24 VDC / +/- 20% / 2.0 W	ISG-N34/24 VDC				



Dimensions (ISG Amplifiers and IMX Multiplexers)





Infrared Amplifier Specifications (ISM series)

ISM-1200-* (single channel, manual / automatic gain)



The ISM-1200(S) is a 1-channel amplifier with change-over gain setting mode between manual and automatic (Potentiometer / automatic-control) by DIP switch. The amplifier works with modulated infrared light which provides high immunity to ambient light. The electronic circuit is designed to detect only those signals with the correct frequency and phase relation. This almost completely excludes interference from other light sources.

The analog output, which supplies a voltage between 0...30 V DC independent of the received power, is used to adjust the photo eyes or measure the density of the environment.

Technical Data for ISM-1200 at +68 °F Max. range (through beam) ITL / ITH transmitter and IRL receiver 7 m / 10 m ITL / ITH transmitter and IRH receiver 15 m / 25 m Supply voltage 24 VDC Operating basis modulated IR light Operating mode 2 manual / 2 automatic Transmit power High / low manual adjustment Transmit frequency 3.7 / 4.3 kHz Switching function light / dark Switching delay 60V AC/DC short circuit proof Switching output Analog output 0 ... 10 V Alarm output PNP 24V, 100 mA Response time 24 m s 24 VDC Test input Housing material plastic Protection class IP 20 -13 °F ... +140 °F Operation temperature Purchase order table Model Screw terminal ISM-1200S/24VDC

 Screw terminal
 ISM-1200S/24V DC

 Plug terminal
 ISM-1200/24V DC

ISM-2000- *(two-channel, manual / automatic gain)



The ISM-2000 is a 2-channel amplifier with change-over gain setting mode between manual and automatic (Potentiometer / automatic-control) by DIP switch. The amplifier works with modulated infrared light which provides high immunity to ambient light. The electronic circuit is designed to detect only those signals with the correct frequency and phase relation. This almost completely excludes interference from other light sources.

A permanent sensor control and the alarm function, which is used to signal the power limit, provide signal outputs (alarm and error) to ensure safe operation.

Technical Data for ISM-2000 at +68 °F	
Max. range (through beam)	
ITL / ITH transmitter and IRL receiver	7m / 10 m
ITL / ITH transmitter and IRH receiver	15m / 25 m
Supply voltage	24 VDC
Power consumption	3.6 W
Operating basis	modulated IR light
Transmit frequency	4.0 kHz
Switching mode	light / dark switchable
Operating mode	2 manual / 2 automatic
Multiplex speed	8 m s
Switching output	2 x 60V AC/DC short circuit proof
Alarm output	PNP 24V, 100 mA
Error output	PNP 24V, 100 mA
Housing material	plastic
Protection class	IP 20
Operation temperature	-13 °F +140 °F
Purchase order table	Model
Screw terminal	ISM-2000S/24VDC
Plug terminal	ISM-2000/24VDC

Dimensions (ISM Single-channel Amplifiers and Two-channel Multiplexers)



Infrared Multiplexer Specifications (ISM Series)



ISM-4000/24VDC (four-channel, programmable)



Technical Data for ISM-4000	
at +68 °F	
Max. range (through beam)	
ITL / ITH transmitter and IRL receiver	8 m / 10 m
ITL / ITH transmitter and IRH receiver	15 m / 25 m
Supply voltage	24 VDC
Power consumption	6.5 W
Operating basis	modulated IR light
Transmit frequency	4.0 kHz
Switching mode	light / dark switchable
Operating mode	2 manual / 2 automatic
Multiplex speed	18 m s
Master-Slave mode	yes
Light curtain mode	yes
Time delay ON/OFF	0 60 seconds per channel
Switching output	4 x 60V AC/DC short circuit proof
Alarm output	PNP 24V, 100 m A
Error output	PNP 24V, 100 m A
Housing material	plastic
Protection class	IP 20
Operation temperature	-13 °F +140 °F
Purchase order table	Model
Plug terminal	ISM-4000/24VDC

The ISM-4000 is a 4-channel amplifier with manual and automatic change-over gain setting modes that may be used to control 4 sets of Pantron transmitter and receiver photo eyes. The ISM-4000 is compatible with all Pantron photo eyes except the SlimLine series.

The amplifier works with modulated infrared light which provides high immunity to ambient light. The electronic circuit is designed to detect only those signals with the correct frequency and phase relation. This almost completely excludes interference from other light sources.

Programming changes to the ISM-4000 may be performed using the three pushbuttons located on the face of the device. The LCD screen provides a user interface to make navigation of the system menus easy. All programming changes may also be done remotely using free WinISM software, which is available for download, and a communications cable (COM-CABLE), sold separately. Once changes have been made, a profile may be created using the WinISM software in the form of a file that may be saved to and loaded from a PC.

Features of the ISM-4000 include, photo eye alignment and diagnostic tools as well as sensitivity control, light curtain mode, and On/Off time delay (up to 60 seconds per channel.)

The ISM-4000 may be synchronized with other ISM-4000 and ISM-8000 devices through a Master-Slave connection, which allows additional sets of photo eyes to be used in close proximity to one another without crosstalk between them.

The analog output, which supplies a voltage between 0...30 V DC independent of the supply voltage, is used to adjust the photo eyes or measure the density of the environment.

Dimensions (ISM-4000 Series Multiplexer)





Infrared Multiplexer Specifications (ISM Series)



Technical Data for ISM-8000 at +68 °F	
Max. range (through beam)	
ITL / ITH transmitter and IRL receiver	10 m / 12 m
ITL / ITH transmitter and IRH receiver	15 m / 25 m
Supply voltage	24 VDC
Power consumption	6.5 W
Operating basis	m odulate d IR light
Transmit frequency	4.0 kHz
Switching mode	light / dark switchable
Operating mode	2 manual / 2 automatic
Multiplexspeed	18 m s
Master-Slave mode	yes
Light curtain mode	yes
Time delay ON/OFF	0 60 seconds per channel
Switching output	8 x 60V AC/DC short circuit proof
Alarm output	PNP 24V, 100 m A
Error output	PNP 24V, 100 m A
Housing material	plastic
Protection class	IP 20
Operation temperature	-13 °F +140 °F
Purchase order table	Model
Plug terminal	ISM-8000/24VDC

Dimensions (ISM-8000 Series Multiplexer)

The ISM-8000 is an 8-channel amplifier with manual and automatic change-over gain setting modes that may be used to control 8 sets of Pantron transmitter and receiver photo eyes. The ISM-8000 is compatible with all Pantron photo eyes except the SlimLine series.

The amplifier works with modulated infrared light which provides high immunity to ambient light. The electronic circuit is designed to detect only those signals with the correct frequency and phase relation. This almost completely excludes interference from other light sources.

Programming changes to the ISM-8000 may be performed using the three pushbuttons located on the face of the device. The LCD screen provides a user interface to make navigation of the system menus easy. All programming changes may also be done remotely using free WinISM software, which is available for download, and a communications cable (COM-CABLE), sold separately. Once changes have been made, a profile may be created using the WinISM software in the form of a file that may be saved to and loaded from a PC.

Features of the ISM-8000 include, photo eye alignment and diagnostic tools as well as sensitivity control, light curtain mode, and On/Off time delay (up to 60 seconds per channel.)

The ISM-8000 may be synchronized with other ISM-8000 and ISM-4000 devices through a Master-Slave connection, which allows additional sets of photo eyes to be used in close proximity to one another without crosstalk between them.

The analog output, which supplies a voltage between 0...30 V DC independent of the supply voltage, is used to adjust the photo eyes or measure the density of the environment.



Photo Eye Accessories

Cable connectors for quick-connect photo eyes	Ordering code	Picture
Cable connector M12, straight, 3-pole, length 5m (for use with photo eyes type 4QD and C4)	CAB-M12-S3-5m	
Cable connector M12, right-angled, 3-pole, length 5m (for use w ith photo eyes type 4QD and C4)	CAB-M12-R3-5m	
Cable connector M8, straight, 3-pole, length 5m (for use with photo eyes type 3QD and B3)	CAB-M8-S3-5m	
Cable connector M8, right-angled, 3-pole, length 5m (for use w ith photo eyes type 3QD and B3)	CAB-M8-R3-5m	

Sensor mounting device	Ordering code	Picture
12mm "L" shaped bracket for mounting threaded photo eyes.	BKT-12mm	
Screw clamp for 10mm transmitter / receiver. M6 threaded bushing for mounting.	ISH 1	
Mounting clip for 10mm transmitter / receiver	ISH 2	
Strain relief w ith 1/2" thread for mounting 10mm transmitter / receiver	ISH 10	

Protective light shields (stainless steel)	Ordering code	Picture
Light shutter, 1mm diameter opening for use with M12, threaded photo eyes	IR 1	
Protective glass shield for use with M12, threaded photo eyes	IR 2	
Polarized protective glass shield for use with M12, threaded photo eyes	IR 3	



FREQUENTLY ASKED QUESTIONS

• Can the transmitter and receiver cables be spliced? Yes. Pantron photo eye cables may be extended. A good rule of thumb is to limit the extension to 35 meters or approx. 150 feet but do not exceed 10 OHMS. Make a good electrical splice and solder the wires. Apply heat shrink tubing to the spliced cable area. Do not use wire nut connectors.

• Will bright sunlight cause problems for the photo eyes? Pantron eyes are rated to 60,000 LUX. This provides the system a high immunity to sunlight. If possible mount the receiver photo eye so that it does not receive direct sunlight to further reduce the effects.

• How do Pantron photo eyes see through heavy fog, spray, dirt, and grease? Pantron photo eyes are manufactured with a Lexan filter on the front of each photo eye. The lens is located behind the filter to protect it from contamination. This allows the infrared beam to be focused by the time it reached the outer filter.

 Is it necessary to use the infrared photoelectric amplifier or multiplexer with the photo eyes? Yes. This is a closed loop system. The Pantron SlimLine self contained series is available for applications where using a closed-loop system is not possible.

• What is the maximum temperature the photo eyes can withstand? 150° F during operation. For applications up to 700° F, choose the M12 style photo eyes and use a fiber optic cable extension.

• Will vibration on a machine cause a problem if it moves the photo eyes out of alignment? Pantron photo eyes have a wide opening angle that allows the sensors to withstand vibration.

• Can the photo eyes be mounted in wet areas in a location where machinery is being washed down? Pantron photo eyes are rated IP67 and can be submersed under water.



Photo Eye Accessories

Glass fiber optic cables	Ordering code	Picture
1m cable w ith M12 threaded end (for use w ith photo eyes type M12, CLN, CLV, CSN, CSV)	PIT.156-1m	
3m cable w ith M12 threaded end (for use w ith photo eyes type M12, CLN, CLV, CSN, CSV)	PIT.156-3m	
5m cable w ith M12 threaded end (for use w ith photo eyes type M12, CLN, CLV, CSN, CSV)	PIT.156-5m	
1m cable w ith M12 threaded 90° end (for use w ith photo eyes type M12, CLN, CLV, CSN, CSV)	PIAT.156-1m	
3m cable w ith M12 threaded 90° end (for use w ith photo eyes type M12, CLN, CLV, CSN, CSV)	PIAT.156-3m	Additional styles, including cables
5m cable w ith M12 threaded 90° end (for use w ith photo eyes type M12, CLN, CLV, CSN, CSV)	PIAT.156-5m	with bifurcated ends are available

Amplifier / multiplexer mounting	Ordering code	Picture
11-pole socket for DIN rail mounting (required for all ISG and 2-channel IMX series)	MB11	
Retaining clip for DIN socket MB11 (recommended for applications with heavy vibration)	RTC 11	

Enclosures for Protecting Amplifiers and Multiplexers





Adjustable Fork Light Barriers

Fork light barriers with adjustable fork width...

... are established sensors with a new concept. Until now, different applications required fixed fork light barriers – high storage and procurement costs were the result. In the future, the complete fork width range from 5 to 85mm and 5 to 145mm can be covered with a single variable type. The application possibilities are unlimited; the optimal adjustment of the fork width makes it possible to detect, for example, a small slot in a thin plate as well as an object on a conveyor belt. The modification of the fork depth and the maximum fork width is possible after the initial installation due to the modular design.

The automatic power adjustment with dirt compensation enables a fast and easy startup without further adjustments. The light barrier will adjust automatically to the selected fork width after switching on the power. Furthermore, the sensitivity automatically adjusts to overcome contamination of the optics.

For special applications, there are manual settings and a teach function. An extra outstanding feature of this product series is the software setting with Pantron's Win-Connect. This includes:

- Extended programming
- Diagnostic
- Software adaptation and update





Technical Data (at 70 °F, 24	VDC)					
Operating voltage		+ 12 VDC + 30 VD	C			
Current consumption		20 mA				
Output		PNP / NPN / Push-Pul	NP / NPN / Push-Pull			
Load		200 mA				
Voltage drop		1.3 V				
Resolution / Reproducibility		1.0 mm / 0.1 mm				
Sw itching frequency		4 kHz / 10 kHz				
Pulse stretching		0 / 1 / 10 / 100 ms				
Ambient light immunity		60,000 Lux				
Ambient temperature		14 °F 140 °F				
Insulation voltage endurance		500 V				
Protection class		IP 67				
lousing material		aluminum black anodized				
Ordering table						
Fork w idth		5 85 mm		5 145 mm		
Fork depth		60 mm	90 mm	60 mm	90 mm	
Switching frequency 4 kHz	Transmit light red (650 nm)	FSR-085V060-B3	FSR-085V090-B3	FSR-145V060-B3	FSR-145V090-B3	
	Transmit light infrared (890 nm)	FSI-085V060-B3	FSI-085V090-B3	FSI-145V060-B3	FSI-145V090-B3	
Switching frequency 10 kHz	Transmit light red (650 nm)	FSR-085V060-S-B3	FSR-085V090-S-B3	FSR-145V060-S-B3	FSR-145V090-S-B3	
	Transmit light infrared (890 nm)	FSI-085V060-S-B3	FSI-085V090-S-B3	FSI-145V060-S-B3	FSI-145V090-S-B3	



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