



**IP Series Cameras
Installation Manual**



Please read this manual before installing your equipment

IMPORTANT

The first few pages of these instructions contain important information on safety and product conformity. Please read, and ensure that you understand this information before continuing.



**TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS
APPLIANCE TO RAIN OR MOISTURE**

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INTRODUCTION

These instructions cover Baxall IP series cameras. Read all of these instructions. Use them to install the camera and have them available for its lifetime. If you have any problems, contact Baxall Limited. All IP series cameras are fitted with a Direct Drive (DD) lens connector, have adjustable back focus and accept C and CS lenses.

Option	IPC-9252	IPC-9252/M	IPC-9252E	IPC-9742	IPC-9742/M	IPC-9742E	IPC-9742E/M	IPC-9313	IPC-9313/M	IPC-9313N	IPC-9714	IPC-9714/M	IPC-9714N	IPC-9714N/M
Mono	●	●	●	●	●	●	●							
Color								●	●	●	●	●	●	●
Maximum Resolution (TVL)	580	580	580	580	580	580	580	480	480	480	480	480	480	480
Sensitivity (lux @ f1.2)	0.1	0.1	0.1	0.04	0.04	0.04	0.04	0.9	0.9	0.9	0.4	0.4	0.4	0.4
CCD Sensor size	1/3"	1/3"	1/3"	1/2"	1/2"	1/2"	1/2"	1/3"	1/3"	1/3"	1/2"	1/2"	1/2"	1/2"
Sony HyperHAD™ CCD	●	●	●					●	●	●				
Sony ExviewHAD™ CCD				●	●	●	●				●	●	●	●
CCIR	●	●		●	●									
EIA			●			●	●							
PAL								●	●		●	●		
NTSC										●			●	●
H261 Compression	●		●	●		●		●		●	●		●	
MJPEG Compression		●			●		●		●			●		●
Adjustable Gamma	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Automatic Gain Control On/Off	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Backlight Compensation On/Off	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Electronic Iris On/Off	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Video Drive Auto-Iris connection	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Direct Drive Auto-Iris connection	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Extended IR performance				●	●	●	●							

There are a number of variants in the IP series camera range, with 1/2" and 1/3" CCD monochrome output (CCIR or EIA format) and colour output (PAL or NTSC) models available. There is also a choice between models configured to use H261 compression and models that use MJPEG compression. All the variants require an external 12V DC power supply.

The IP series cameras are designed to encode compressed video and transmit the data over either a 10 or 100 Base-T network at variable bit rates of between 8Kbps and 1.5Mbps. Using an IP decoder, this data can be converted to an analogue video signal and displayed on a standard CCTV monitor (H261 compression only). Alternatively, IP series cameras can be displayed on a PC using the IP PC Viewer.

A serial data channel can be set up to support RS232, RS422 or RS485 operation, allowing integration with third party equipment. In addition, provision is made for two alarm inputs, one alarm output, and a bi-directional audio channel (G711 or G728).

Video (H261 or MJPEG) and audio (G711 or G728) options are pre-programmed at production. However, different software can be downloaded into the camera using the Video Administrator tool, as described in the IP PC Viewing and Configuration Software Manual. These downloads are available by contacting Baxall Technical Support.

⚠ WARNING

- Installation and servicing is only to be carried out by suitably qualified and experienced personnel to local or national wiring standards. Failure to do so can result in death or injury by electric shock.
- A means of disconnecting the equipment from the mains supply must be provided as part of the installation and must be situated close by.
- Before undertaking any installation or maintenance, the mains supply must be disconnected.
- Good engineering practice must be carried out at all times and all servicing and repairs carried out indoors.
- All IP series cameras are to be powered with a class 2 power supply.
- Do not exceed the voltage and temperature limits given in the specifications.
- The IP series camera is fitted with a 1 A (T) 125V time-lag fuse located on the rear board assembly. Replacement must be with an identical type of fuse.
- The IP series range is designed for use in general purpose CCTV applications and has no other purpose.
- Only use your IP series camera in a clean, dry, dust-free environment unless a suitable protective housing is provided.

Electrical Safety

British Standard BSEN60950:2000 Safety of information technology equipment, including electrical business equipment.

ELECTROMAGNETIC COMPATIBILITY (EMC)**⚠ WARNING**

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Radio Frequency Emissions

Federal Communications Commission Code of federal regulations Part 15.

British standard BSEN50081-1:1992 Electromagnetic compatibility - Generic emission standard.

Part 1. Residential, commercial and light industry British standard BSEN55022:1998 Limits and methods of measurement of radio disturbance characteristics of information technology equipment.

Immunity

British Standard BSEN 50130-4:1996 Alarm Systems Part 4 Electromagnetic compatibility.

Product family standard: Immunity requirements for components of fire, intruder and social alarm systems.

EU CONFORMANCE STATEMENT

A "Declaration of Conformity" in accordance with the following EU standards has been made and is on file at Baxall Limited, Stockport SK6 2SU England.

The manufacturer declares, that the product supplied with this document is compliant with the provisions of the EMC Directive 89/336 EEC, the CE Marking Directive 93/68 EEC and all associated amendments.

REGULATORY NOTICES

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference that may cause undesired operation.

UNPACKING

Keep your packaging for use if the product is to be stored for an extended period or needs to be returned for any reason. The packaging should contain:

- An IP Series Camera
- Panasonic Plug for Direct Drive (DC) Auto-Iris Lenses
- Camera Mounting Screws
- A 15-Way D-Type Connector
- Licence Agreement
- These Instructions

Check the product code on the serial number label. If you have an incorrect item or it is damaged then inform the suppliers and carriers immediately. If this is the case then do not attempt to use the equipment.

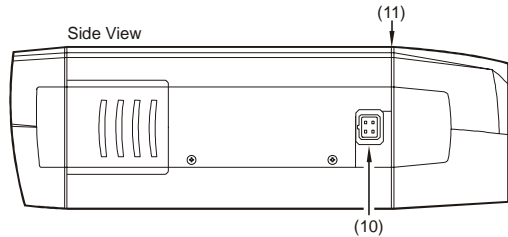
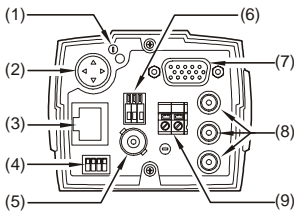
Please read the licence agreement, as by using this product you agree to all of the terms and conditions contained within it.

△ CAUTION

In order to avoid damaging the camera note the following points.

- 1) The camera has threaded mounting points on the top and bottom of the case. Only use a standard, photographic, mounting-bolt with a 1/4-20 UNC thread.
- 2) Before fitting the lens make sure that its back will not touch the CCD sensor or associated components when screwed fully home.
- 3) Do not touch the image-surface of the sensor. If the sensor is accidentally touched, only clean it using ethyl alcohol.
- 4) Do not expose the sensor to direct sunlight as this may impair the performance of the camera.
- 5) Only use the camera in a clean, dust-free environment.
- 6) For outdoor use, an appropriate protective housing conforming to IP65 or UL50 or better must be used.

CONNECTORS AND CONTROLS



- | | |
|---|---|
| 1. Power LED | 7. Serial, Alarms and Audio 15-pin D-type Connector |
| 2. Joystick (no function) | 8. Video Server Inputs |
| 3. RJ45 Ethernet Connector | 9. Low-Voltage Power Supply Terminals (12V DC) |
| 4. Camera Settings Dip Switches | 10. Direct-Drive (DC) Auto-Iris Lens Connector |
| 5. Composite Video Output BNC | 11. Back-Focus Adjustment Screw |
| 6. Video Drive Auto-Iris Lens Connector | |

POWER SUPPLY CONNECTION

IP series cameras operate via an external power supply at 12V DC ONLY. **This power supply must be a Class 2 isolated type and be capable of delivering a current of 1 Amp in normal operation.**

The power connector is located on the rear panel of the camera, with the polarity clearly marked. A green LED is also present on the rear panel, and this lights when the power supply is connected and switched on.

VIDEO CONNECTIONS

The colour variants in the IP camera range are available with sensors suitable for either NTSC or PAL format output, and the monochrome variants are available with sensors suitable for either CCIR or EIA format output. IP series cameras can automatically detect which type of sensor has been fitted and they will then select the corresponding output type. To change from PAL to NTSC or from CCIR to EIA, a new sensor board must be fitted in the factory.

Analogue Inputs

IP series cameras are provided with three auxiliary inputs enabling external analogue video inputs to be connected. The inputs are terminated by 75Ω. Care must be taken to ensure that the inputs are not “double-terminated” when the equipment is looped in with other equipment.

The inputs may be a mixture of monochrome or colour.

Analogue Output

A BNC socket is provided on the rear panel for output of a standard composite video signal. This enables focus and other camera parameters to be set up locally, without connecting to the network. Alternatively, this output can be used as a conventional composite video output for use with existing analogue systems.

LENS SELECTION

Suitable lens types are C or CS mount in fixed-iris, manual-iris, auto-iris or direct-drive versions. Sizes are shown below. Cameras are factory set for CS mount lenses.

Lens size	IPC-9252	IPC-9252/M	IPC-9252E	IPC-9742	IPC-9742/M	IPC-9742E	IPC-9742E/M	IPC-9313	IPC-9313/M	IPC-9313N	IPC-9714	IPC-9714/M	IPC-9714N	IPC-9714N/M
1/3"	●	●	●					●	●	●				
1/2"	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2/3"	●	●	●	●	●	●	●	●	●	●	●	●	●	●
1"	●	●	●	●	●	●	●	●	●	●	●	●	●	●

LENS CONNECTION

Fixed and Manual Iris Lenses (for indoor use only) require no wiring connections.

Video Drive Auto-Iris Lenses

Connections for video drive auto-iris lenses are located on the rear of the camera. Connect lenses to the 3 terminal connector block according to the table below.

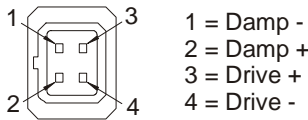
Connector	Description
Red	Lens positive supply
Black	Lens ground
White	Video drive signal

Once the lens has been connected, switch the EI and AGC functions off using the dip switches located on the rear panel of the camera. Referring to the lens instructions, adjust the lens for optimum picture (video output level of 1V pk-pk), and switch AGC back on.

See page 13 for more details on using the dip switches on the rear of the camera.

Direct Drive Auto-Iris Lenses

Connect DD lenses to the female 4-pin socket on the side of the camera. If the lens does not have a DD plug fitted then wire the lens to a suitable plug in accordance with the diagram below.



Once the lens is connected, switch the EI and AGC functions off using the dip switches located on the rear panel of the camera. Using an appropriate screwdriver, turn the lens level potentiometer fully clockwise. Next slowly adjust the lens level potentiometer for optimum picture (video output level of 1V pk-pk), and switch AGC back on.

See page 13 for more details on using the dip switches on the rear of the camera.

⚠ WARNING

Under no circumstances must the power consumption of the rear Video Drive connector exceed 50 mA or the Direct Drive connector exceed 25 mA.

FOCUS ADJUSTMENT

Turn the back focus adjuster screw on the top of the camera clockwise or anticlockwise to obtain focus. When the focus is sharp, turn the adjustment screw 2 or 3 turns anticlockwise. The picture will lose sharpness. Turn the screw clockwise until focus is once again obtained. If the point of best focus is passed, repeat the procedure. **The last turn of the back focus adjustment screw must always be in a clockwise direction.** Do not 'over turn' or force the back focus mechanism.

Fixed Lenses

Set the lens focus to infinity and view an image greater than 2 metres away. Focus the image using the back-focus screw. Set the lens focus as required.

Manual Iris Lenses

Open the iris fully and set the lens focus to infinity. View an image greater than 2 metres away. Focus the image using the back-focus screw. Set the lens focus and iris as required.

Video Drive and Direct Drive Auto-Iris Lenses

Fully open the iris by covering the lens with a suitable neutral density (ND) filter. Set the lens focus to infinity. View an image greater than 2 metres away. Focus the image using the back-focus screw. Remove the ND filter and set the lens focus as required.

Zoom Lenses

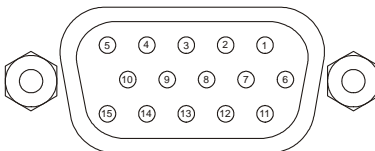
Set the lens focus to infinity and fully open the iris by covering the lens with a suitable neutral density (ND) filter. Zoom out to the widest field of vision and view a distant object. Adjust the back focus screw until the object is in focus. Next, zoom fully in and adjust the focus of the lens until the object is again focused. Repeat these steps until the full zoom range may be viewed with the minimum loss of focus.

AUDIO CONNECTIONS

IP series cameras include a mono-channel audio input and output.

The circuitry enables connection of audio equipment to the input channel. This input channel is pre-programmed to G711 or G728 compression and has a bandwidth of 0.3 – 3.6 kHz. The output channel gives a 1V pk-pk output for connection to other audio equipment or the direct drive of a small loudspeaker.

The audio line in and out connections should be made to the 15-way D-type connector on the rear of the camera. Pins 5, 10 and 15 should be connected as follows:

**Audio Connection**

- 5. Audio In
- 10. Common
- 15. Audio Out

Note

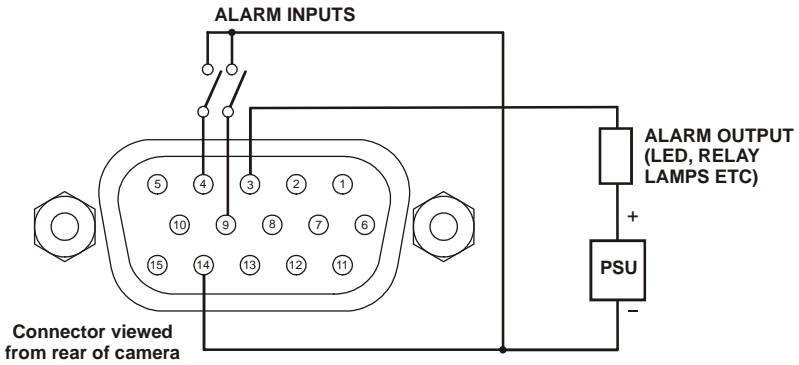
The audio line in and out signals are at line level. Connections to PA systems or microphones may need additional equipment. Please contact your distributor for technical assistance.

ALARM CONNECTIONS

The IP series cameras provides two alarm inputs via internal opto-isolators, and these inputs can be used to interface to a variety of equipment. The internal resistors are set for operation with 5V – 12V inputs, but inputs operating at 24V or other voltages can be achieved by adding external padding resistors.

An alarm output is also provided via an internal open collector transistor rated at 24V 250mA. It is suitable for use with driving lamps, alarms and other external equipment.

Alarm inputs and output connections are made to the 15-way D-type connector on the rear of the camera. Pins 3, 4, 9 and 14 should be connected as follows:

**Note**

In applications where it is required to operate higher-powered equipment, a separate external interposing relay should be used.

SERIAL CONNECTIONS

IP series cameras can be configured for connection to RS232, RS422 or RS485 networks. These serial connections are made to the 15-way D-type connector on the rear of the camera. Pins 1, 2, 6, 7 and 8 should be connected as follows:

PIN	RS232	RS422	RS485
1	RTS	Tx+	Tx+
2	Rx	Rx-	Rx-
6	Tx	Tx-	Tx-
7	CTS	Rx+	Rx+
8	Ground	Not Used	Not Used

For RS485 connections, the installer must also link pin 1 to pin 7, and pin 2 to pin 6 on the back of the connector itself.

Biasing and Termination


It may then be necessary to apply biasing and termination to these networks. This can be implemented in one of two ways:

- Through the use of internal dip switches.
- By adding resistors to the serial connector externally if it is not possible or desirable to remove the camera lid.

To access the internal resistors the camera lid must be removed. The resistors are located at the bottom edge of the IP interface card (P1102 – the longer of the two side cards).

The internal switch settings are shown below:



 White indicates switch position

NETWORK CONNECTION

A shielded RJ45 Ethernet connector is provided on the rear of the camera for direct interface to the network. The connector is suitable for use on both 10 and 100 Base-T networks.

Internal line terminations for a screened Cat 5 cable are also provided.

SWITCH SETTINGS

There are four function switches on the rear panel of the IP series cameras that control the Backlight Compensation (BLC), Electronic Iris (EI), gamma correction and Automatic Gain Control (AGC) functions.



White indicates switch position

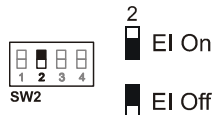
Backlight Compensation (BLC)

Backlight compensation operates by enhancing objects in the centre of the scene which would previously have been in silhouette. The BLC feature is turned **ON** or **OFF** using dip switch number 1. Default setting is **OFF**.

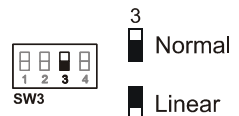
BLC will only function with a manual iris lens when the Electronic Iris feature is switched **ON**. For direct drive and video drive auto-iris lenses, BLC will still function even though the Electronic Iris feature is switched off.

**Electronic Iris (EI)**

The Electronic Iris (EI) feature compensates for excessive light levels by automatically adjusting the shutter speed of the camera. Select **ON** or **OFF** using dip switch number 2. The default setting is **OFF**.

**Gamma**

Dip switch number 3 is used to select between the two available gamma correction options. Use the switch to select **NORMAL** (0.45), which provides increased visibility within the darker areas of a scene, or **LINEAR** (1.0) for a more linear response. The default setting is **NORMAL**.

**Automatic Gain Control (AGC)**

The Automatic Gain Control feature can improve picture quality when the level of scene illumination is low. Select **ON** or **OFF** using dip switch number 4. For most applications, the AGC feature should be **ON** and is therefore the default setting.

**Synchronisation**

The camera is set to **INTERNAL**, which locks the frame rate to a frequency generated by an internal crystal.

PROGRAMMING AND ADDRESSING

IP series cameras are pre-programmed with the appropriate video and audio software to suit the application.

MAC Address

This is pre-programmed at the factory and cannot be altered by the customer.

IP Address

The default IP address programmed into the unit is 10.1.166.1 with a subnet mask of 255.224.0.0. This may be changed using the Video Administrator tool, as described in the IP PC Viewing and Configuration Software Manual (available from www.baxall.com).

Description

Video camera with three auxiliary video inputs, duplex audio, full duplex data communications and integrated Ethernet connection.

Video Format

Pre-programmed with H261 or MJPEG compression. Software downloads available to alter format.

Video Resolutions

Interchangeable choice of resolutions from 704 x 576 pixels to 176 x 144 pixels.

4CIF: 704 x 576 pixels	} Supports MJPEG only
VGA: 640 x 480 pixels	
CIF: 352 x 288 pixels	} Supports H261 and MJPEG
SIF: 352 x 240 pixels	
QCIF: 176 x 144 pixels	

(Maximum Resolution TVL as stated on page 4 possible using 4CIF setting)

Video Performance

Up to 25/30 frames per second at CIF resolution with H261; up to 15 frames per second at CIF resolution with MJPEG.

Auxiliary Video Inputs

Three 1V pk-pk inputs terminated in 75Ω.

Auxiliary Video Output

1V pk-pk composite video.

Audio

Bi-directional. Pre-programmed to G711 or G728 compression. Software downloads available to alter format.

Network Protocols

Internet IP, TCP, UDP, ICMP, ARP and IGMP with configuration via administration tools.

Interfaces

LAN data rate: 8 Kbps up to 1.5 Mbps.

Data Interface: RS232, RS422 or RS485 at 120 bps - 115 Kbps.

Alarm Interface: 2 inputs and 1 output. Inputs opto-isolated, TTL level. Outputs via open collector 24V, 250mA.

Audio interface: Line-in and line-out, Bandwidth 0.3-3.6 kHz, 1V peak-peak.

Temperature

Operating: -10°C to +50°C (14°F to 122°F)

Storage: -10°C to +70°C (14°F to 158°F)

Relative Humidity

Operating: 20% - 80% non-condensing; Storage: 20% - 90% non-condensing

Power Consumption

10W Max

Power Supply

12V DC (+/-10%)

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Visit our web sites at <http://www.baxall.com> and <http://www.baxallnetworks.com>

Baxall Limited reserve the right to make changes to the product and specification of the product without prior notice to the customer.