



**X Series DSP Cameras
Installation Instructions**

Read these instructions first!

INTRODUCTION

These instructions cover Baxall X series cameras. Read all of these instructions. Use them to install your camera and have them available for its lifetime. If you have any problems, contact Baxall Limited. Note that not all cameras have all of the features described in this manual. Refer to the table below for the features of individual cameras. All Baxall X series cameras are fitted with a Direct Drive (DD) lens connector, have adjustable back focus and accept C and CS lenses.

Option	CDX9742	CDX9742/LV	CDX9714	CDX9714/LV	CDX9772	CDX9772/LV	CDX9772/NF	CDX9772/LV/NF
Colour			●	●				
Mono	●	●						
Colour/Mono auto-switching					●	●	●	●
Resolution (TVL)	570	570	480	480	570	570	480	480
Colour sensitivity (lux @ f1.2)			0.4	0.4	0.75	0.75	1.5	1.5
Mono sensitivity (lux @ f1.2)	0.04	0.04			0.08	0.08	0.4	0.4
Extended IR Performance	●	●						
CCD Sensor size	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"
Sony HyperHAD CCD					●	●		
Sony EXviewHAD CCD	●	●	●	●			●	●
Adjustable Gamma (0.45 and 1.0)	●	●	●	●	●	●	●	●
Automatic Gain Control (AGC)	●	●	●	●	●	●	●	●
AGC on/off	●	●	●	●	●	●	●	●
Backlight Compensation (BLC)	●	●	●	●	●	●	●	●
Eight BLC Windows	●	●	●	●	●	●	●	●
Manual Shutter	●	●	●	●	●	●	●	●
Flickerless mode	●	●	●	●	●	●	●	●
Electronic Iris (EI)	●	●	●	●	●	●	●	●
EI on/off	●	●	●	●	●	●	●	●
4 Colour Balance modes*			●	●	●	●	●	●
Auto Iris connection	●	●	●	●	●	●	●	●
Genlock	●	●	●	●	●	●	●	●
Line lock with phase adjust (AC only)	●	●	●	●	●	●	●	●
Peak White Inversion (PWI)	●	●	●	●	●	●	●	●
Adjustable PWI Threshold	●	●	●	●	●	●	●	●
Supply								
11 - 40 VDC; 12 - 30 VAC		●		●		●		●
98 - 260 VAC ± 10%	●		●		●		●	

* 4 Modes = Auto Tracing (ATW), Indoor, Outdoor and Fluorescent

PRODUCT SAFETY

⚠ WARNING

- **Installation and servicing is only to be carried out by suitably qualified and experienced personnel.**
- **Mains cameras contain hazardous voltages**
- **Do not remove covers as there is a risk of injury or death by electric shock.**
- **Cameras connected to mains supplies must be earthed.**
- **Only power low voltage cameras from a class 2 isolated power supply.**

The Baxall X series camera range is designed for use in general purpose CCTV applications and has no other purpose. Only operate your camera between the temperatures of -10°C and +50°C. Do not operate your camera outside its specified power supply range. Baxall X series cameras must only be used in clean, dry, dust-free environments unless housed in a suitable protective housing to IP65 or better.

ELECTROMAGNETIC COMPATIBILITY (EMC)

⚠ CAUTION

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.

This product is intended solely for use in general CCTV applications.

The product must be installed and maintained in accordance with good installation practice to enable the product to function as intended and to prevent problems. Refer to Baxall Limited for installation guidance.

MANUFACTURER'S DECLARATION OF CONFORMANCE

The manufacturer declares that the equipment supplied with this manual is compliant with the essential protection requirements of the EMC directive 89/336 and the Low Voltage Directive LVD 73/23 EEC. Conforming to the requirements of standards EN 55022 for emissions, IEC801 parts 2, 3 and 4 for immunity and EN 60950 for Electrical Equipment safety.

CAUTIONS

△CAUTION

In order to avoid damaging your 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 isopropanol.
- 4) Do not expose the sensor to direct sunlight as this may impair the performance of the camera.

POWER SUPPLY

Baxall X series cameras are available in AC mains and AC and DC low voltage types. **The voltage required to operate the camera is clearly marked on the rear panel of the camera.** The green POWER LED on the rear panel indicates that power is connected. **Only power low voltage cameras from a class 2 isolated power supply.** The power consumption of a Baxall X series camera is less than 5 Watts.

Mains power supply

Cameras that are intended to operate directly from the mains supply are fitted with a non-detachable power supply cord. The voltage of operation is clearly marked on the rear panel of the camera. Generally this is 98 - 260V AC at 50Hz. REFER TO THE WIRING INSTRUCTION LABEL ATTACHED TO THE SUPPLY CORD and terminate the cord with the appropriate mains plug fitted with a 3A fuse. **MAINS CAMERAS MUST BE CONNECTED TO A PROTECTIVE EARTH.** Ensure that a secure means of isolation from the mains is provided for the camera in accordance with the national wiring regulations of the country of installation.

Auto-switching power supply

Cameras fitted with an automatic selecting power supply operate between 11-40V DC and 12-30V AC. Connections and polarity are indicated above the screw terminals on the rear panel. **The power supply must be a class 2 isolated type.**

VIDEO CONNECTIONS

To obtain a video output, connect a video coaxial cable terminated with a 75Ω BNC connector to the BNC socket marked VIDEO OUT on the rear of the camera.

On selected cameras, a means of external synchronisation may be provided - see the table on page 2 for details. For external synchronisation, connect a video coaxial cable terminated with a 75Ω BNC connector to the socket marked GENLOCK on the rear of the camera. The GENLOCK facility synchronises to either a 1V peak-to-peak video signal or a standard sync plus blanking signal. A signal connected to the GENLOCK input automatically overrides all other synchronisation settings.

On colour cameras, the genlock facility locks the lines and not the subcarriers together.

FUNCTION SWITCHES

On the side of the camera is a hinged flap. The hinged flap covers a lens level potentiometer, the Peak White Inversion threshold potentiometer, the BLC window activation button and three banks of function switches.

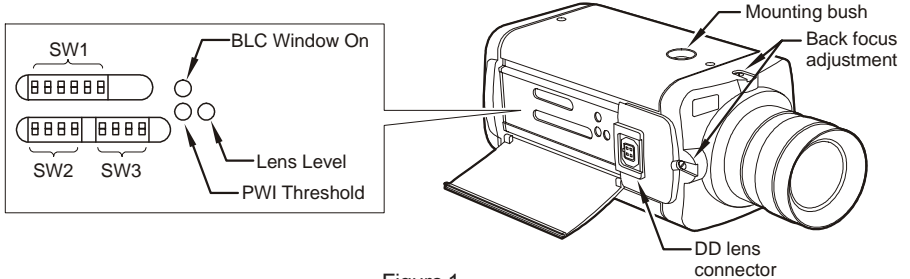


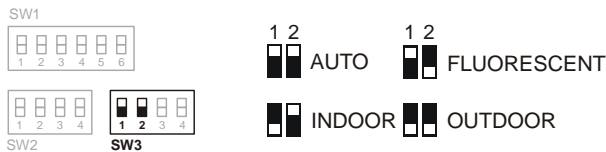
Figure 1

Switch Naming Conventions

The DIP switches located under the hinged flap are in three banks SW1, SW2 and SW3. Throughout this manual, switches are referenced in the following manner: **SW1-3** which corresponds to switch number 3 of switch bank 1.

Colour Balance

There are four colour balance modes selected by dip switches SW3-1 and SW3-2. For the majority of applications the **Auto** setting will provide excellent colour rendition and is the default setting. For applications where the illumination is predominantly daylight, the **Outdoor** setting may provide improved colour rendition over Auto. Where a mixture of illuminations such as tungsten, fluorescent and daylight exist, the **Indoor** setting may provide the best colour rendition. Where fluorescent lighting is predominant use the **Fluorescent** setting.



Gamma

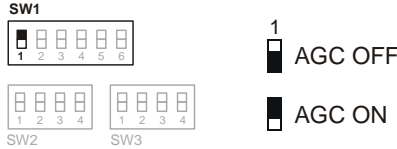
There are two different levels of Gamma selected by dip switch SW3-3. Choose between **Normal** (0.45) to provide increased visibility in dark areas of the scene, or **Linear** (1.0). The default setting is **Normal**.



FUNCTION SWITCHES

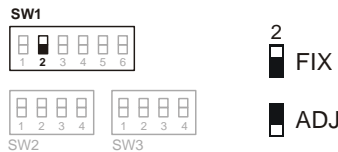
AGC (Automatic Gain Control)

The Automatic Gain Control feature can improve picture quality when the level of illumination is low. Select **ON** or **OFF** using dip switch SW1-1. For most applications, the AGC feature should be **ON** and is therefore the default setting.



LL-PH (Line Lock, Phase Adjust)

The Line Lock, Phase Adjust feature is selected by dip switch SW1-2. Choose **FIX** (fixed) or **ADJ** (adjustable). Both settings are line-locked however, the **ADJ** setting allows $\pm 120^\circ$ phase adjustment via the potentiometer located on the rear of the camera. The **ADJ** mode should be used when cameras are connected to different mains supply phases (R, Y, B). Default setting is **FIX**.



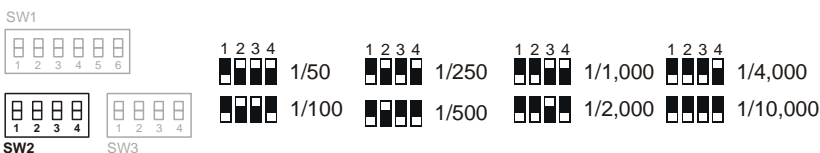
SYNC (Synchronisation)

The Synchronisation feature is selected using dip switch SW1-3. Choose **L/L** (Line-Lock) or **INT** (internal). **L/L** locks the frame rate to the mains so that cameras are triggered at the same point on the mains supply AC cycle. **INT** locks the frame rate to the internal oscillator of the camera. The default setting is **L/L**.



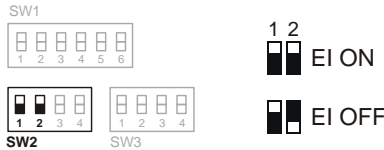
Shutter speed switches

Shutter speeds are selected with dip switches SW2-1, SW2-2, SW2-3 and SW2-4. Dip switch SW2-1 must be down to enable manual shutter speed selection. For EI, BLC and Flickerless functions, switch SW2-1 must be up.



EI (Electronic Iris)

The EI (Electronic Iris) feature compensates for excessive light level by automatically adjusting shutter speed. Selecting Electronic Iris disables manual shutter speed selection. The Electronic Iris setting must not be used when the camera is set to Flickerless mode. The default setting is Electronic Iris **ON**.

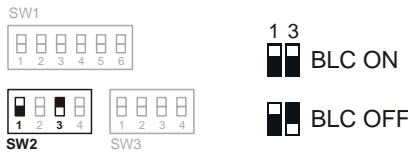


BLC (Back Light Compensation)

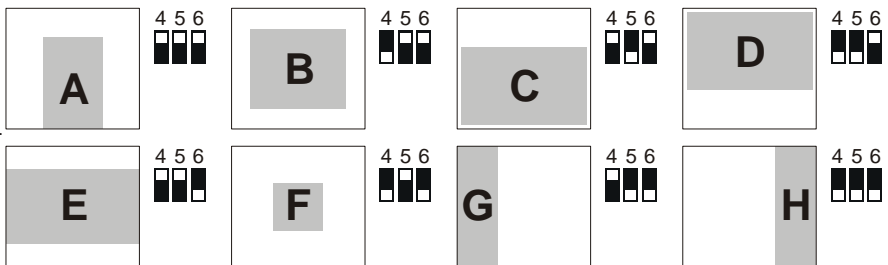
The backlight compensation feature can be used to eliminate the effect of an area of strong background lighting in a scene. If a strong background light such as a window exists in a scene, the camera will try to compensate for it by reducing the overall exposure. This would mean that the areas surrounding the window would become too dark.

By using the backlight compensation feature, it is possible to select areas of the scene which may be used to control the exposure. Typically, the object of interest lies in the centre of the scene and this is the area normally used to calculate the exposure. The edges, where strong backlighting is likely to be, are ignored.

The BLC feature is switched **ON** or **OFF** using switch SW2-1 and SW2-3. Switch SW2-1 must be up. Default is **OFF**. BLC will only function with a manual iris lens when the Electronic Iris feature is switched on. For direct drive and auto iris lenses, BLC will still function even though the Electronic Iris feature is switched off.



To facilitate backlight compensation, eight pre-defined windows are provided. To select a window, first, press the BLC window activation switch (see figure 1). This will superimpose the currently selected window over the video output on the monitor. Use the three dip switches SW1-4, SW1-5 and SW1-6 to select one of the pre-defined windows according to the diagram below.



■ = area used to calculate camera exposure

FUNCTION SWITCHES

The overlay window will automatically disappear 5 seconds after the last dip switch setting is made. Any parts of the scene that are not covered by the BLC window will be ignored when determining the overall scene exposure.

Back Light Compensation feature - Example 1.

People entering a shop through a brightly lit doorway are to be monitored. Without backlight compensation, a person entering the shop would be seen in silhouette because the relatively bright background would cause the camera to reduce its exposure.

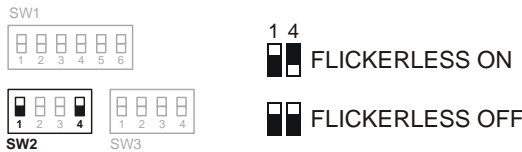
By using the backlight compensation feature, it is possible to select a window around the area of interest, i.e. the doorway. Choosing window **A**, will ensure that the camera exposure system only uses the central area of the scene to calculate the scene exposure. Therefore a person entering the shop will be clearly displayed.

Back Light Compensation feature - Example 2.

The camera is required to observe a typical street scene. The sky above the buildings in the street is very bright causing the camera’s exposure system to overcompensate. Using the backlight compensation feature to select window **C** ensures that the relative brightness of the sky in the scene doesn’t adversely affect the exposure. The buildings and street will be correctly exposed.

Flickerless

The Flickerless setting can reduce the flicker caused by certain lighting conditions. Choose between **ON** or **OFF**. The default setting is **OFF**. Switch SW2-1 must be up. Note that the Electronic Iris setting must be off for correct operation of the Flickerless function.



Peak White Inversion (PWI)

Excessively bright or peak white areas in a scene can cause auto-iris lenses (Direct Drive and Video Drive types) to react and close down thereby losing the detail in darker areas of the scene. The Peak White Inversion feature is designed to overcome this. It allows you to render any part of the scene over a certain brightness threshold as black.

A typical usage of this may occur in a highway surveillance role. Car headlamps would normally cause an auto-iris lens to close. By using peak white inversion to render the headlamps as black, the lens will not react to them and therefore correctly expose the rest of the scene.



FUNCTION SWITCHES

Select PWI **ON** or **OFF** using dip switch SW3-4. The Peak White Inversion threshold potentiometer (see figure 1), allows you to set the level above which all video is set to black. The default setting for the camera is PWI **OFF**.

LENS SELECTION

Suitable lens types are C and 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. If using a C mount lens, rotate either of the back focus screws approximately 30 turns anticlockwise before fitting the lens.

Lens size	CDX9742	CDX9742/LV	CDX9714	CDX9714/LV	CDX9772	CDX9772/LV	CDX9772/WF	CDX9772/LV/WF
1/2"	●	●	●	●	●	●	●	●
2/3"	●	●	●	●	●	●	●	●
1"	●	●	●	●	●	●	●	●

LENS CONNECTION

Fixed and Manual iris lenses (for indoor use only) require no wiring connections.

Auto Iris Lenses

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

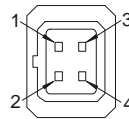
Direct Drive

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.



- + = Lens positive supply
- ⏏ = Lens ground
- V = Video drive signal

Auto-Iris Lens Connections



- 1 = Damp -
- 2 = Damp +
- 3 = Drive +
- 4 = Drive -

DD Lens Connector

LENS SETUP PROCEDURES

For manual or fixed iris lenses set the EI switch and AGC switch to **ON**.

Auto Iris lenses

Switch the EI and AGC off. Refer to the lens instructions and adjust the lens for the optimum picture (video output level of 1V peak-to-peak). Switch the AGC on.

Direct Drive lenses

Where fitted, switch the EI and AGC off. Use an appropriate screwdriver to turn the lens level potentiometer (under the hinged flap) fully clockwise. Next, slowly adjust the potentiometer anticlockwise until the optimum picture is obtained (video output level of 1V peak-to-peak). Switch the AGC on.

FOCUS ADJUSTMENT

The back focus adjustment screws are located on the top and side of the case and should be adjusted using an appropriate screwdriver. If possible, always use the top screw to adjust the back focus mechanism.

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

Fixed Lenses

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

Auto-iris and Direct Drive 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 two metres away. Focus the image using the back focus screw. Remove the ND filter and set the lens focus as required.

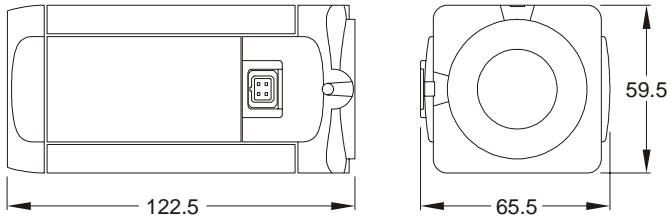
Zoom Lenses

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 lenses focus until the object is again focused. Repeat these steps until the full zoom range may be viewed with the minimum loss of focus.

SYNCHRONISATION

Cameras that operate from AC supplies are line-locked for a supply frequency of 50Hz. If the supply frequency is unstable, then disable the line lock by setting the SYNC switch to **Internal**.

DIMENSIONS



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Baxall Limited reserve the right to make changes to the product and specification of the product from time to time without prior notice