BC840 Series

Full HD IP box camera

Installation Manual

TKH GROUP SECURITY SOLUTIONS

Note: To ensure proper operation, please read this manual thoroughly before using the product and retain the information for future reference.

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BC840
Installation Manual v6 (140705-6)
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1 About this manual

What's in this manual

This manual gives you the information you need to install the BC840 camera. It tells:

- How to mount the camera
- How to mount the lens
- How to connect the camera
- How to power the camera
- How to adjust the focus

Where to find more information

At www.tkhsecurity.com/support-files you will find PDF versions of the product manuals written for the BC840. For the technical specifications, download the product datasheet.

Who this manual is for

These instructions are for all professionals who will install the BC840.

What you need to know

You will better understand how to install the BC840 if you are familiar with:

- Camera technologies
- CCTV systems and components
- Electrical wiring and low-voltage electrical connections
- Connections between fiber optical equipment (SFP models)
- Ethernet network technologies and Internet Protocol (IP)
- Web browsers
- Video, audio, data, and contact closure transmissions

Before you start

We advise you to read and observe all instructions and warnings in this manual before you continue. Keep this manual with the original bill of sale for future reference and warranty service. When you unpack your product, check for missing or damaged items. If any item is missing, or if damage is evident, do not install or operate this product. Contact your supplier for assistance.

Why specifications may change

We are committed to delivering high-quality products and services. The information given in this manual was current when published. As we continuously seek to improve our products and user experience, all features and specifications are subject to change without notice.

We like to hear from you!

Customer satisfaction is our first priority. We welcome and value your opinion about our products and services. Should you detect errors or inaccuracies in this manual, we would be grateful if you would inform us. We invite you to offer your suggestions and comments via t.writing@tkhsecurity.com. Your feedback helps us to further improve our documentation.

2 Safety and compliance

This chapter gives the BC840 safety instructions and compliance information.

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2.1 Safety

The safety information contained in this section, and on other pages of this manual, must be observed whenever this unit is operated, serviced, or repaired. Failure to comply with any precaution, warning, or instruction noted in the manual is in violation of the standards of design, manufacture, and intended use of the module. Siqura assumes no liability for the customer's failure to comply with any of these safety requirements.

Trained personnel

Installation, adjustment, maintenance, and repair of this equipment are to be performed by trained personnel aware of the hazards involved. For correct and safe use of the equipment and in order to keep the equipment in a safe condition, it is essential that both operating and servicing personnel follow standard safety procedures in addition to the safety precautions and warnings specified in this manual, and that this unit be installed in locations accessible to trained service personnel only.

Safety requirements

The equipment described in this manual has been designed and tested according to the **UL/IEC/EN 60950-1** safety requirements. For compliance information, see the EU Declaration of Conformity, which is available for download at www.tkhsecurity.com/support-files.

Warning: If there is any doubt regarding the safety of the equipment, do not put it into operation.

This might be the case when the equipment shows physical damage or is stressed beyond tolerable limits (for example, during storage and transportation).

Important: Before opening the equipment, disconnect it from all power sources.

The equipment must be powered by a SELV[1] power supply. This is equivalent to a Limited Power source (LPS, see UL/IEC/EN 60950-1 clause 2.5) or a "NEC Class 2" power supply. When this module is operated in extremely elevated temperature conditions, it is possible for internal and external metal surfaces to become extremely hot.

1. SELV: conforming to IEC 60950-1, <60 Vdc output, output voltage galvanically isolated from mains. All power supplies or power supply cabinets available from TKH Security comply with these SELV requirements.

Optical safety

The following optical safety information applies to BC840 models with SFP interface.

This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007. This optical equipment contains Class 1M lasers or LEDs and has been designed and tested to meet **IEC 60825-1:1993+A1+A2** and **IEC 60825-2:2004 safety class 1M** requirements.

Warning: Optical equipment presents potential hazards to testing and servicing personnel, owing to high levels of optical radiation.

When using magnifying optical instruments, avoid looking directly into the output of an operating transmitter or into the end of a fiber connected to an operating transmitter, or there will be a risk of permanent eye damage. Precautions should be taken to prevent exposure to optical radiation when the unit is removed from its enclosure or when the fiber is disconnected from the unit. The optical radiation is invisible to the eye.

Use of controls or adjustments or procedures other than those specified herein may result in hazardous radiation exposure.

The installer is responsible for ensuring that the label depicted below (background: yellow; border and text: black) is present in the restricted locations where this equipment is installed.

EMC

Warning: Operation of this equipment in a residential environment could cause radio interference.

This device has been tested and found to meet the CE regulations relating to EMC and complies with the limits for a Class A device, pursuant to 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 received, including interference that may cause undesired operation. These limits are designed to provide reasonable protection against interference to radio communications in any installation. The equipment generates, uses, and can radiate radio frequency energy; improper use or special circumstances may cause interference to other equipment or a performance decrease due to interference radiated by other equipment. In such cases, the user will have to take appropriate measures to reduce such interactions between this and other equipment.

Note that the warning above does not apply to TKH Security products which comply with the limits for a Class B device. For product-specific details, refer to the EU Declaration of Conformity.

Any interruption of the shielding inside or outside the equipment could make the equipment more prone to fail EMC requirements.

To ensure EMC compliance of the equipment, use shielded cables for all signal cables including Ethernet, such as CAT5E SF/UTP or better, as defined in ISO IEC 11801. For power cables, unshielded three wire cable (2p + PE) is acceptable Ensure that *all* electrically connected components are carefully earthed and protected against surges (high voltage transients caused by switching or lightning).

ESD

Electrostatic discharge (ESD) can damage or destroy electronic components. *Proper precautions should be taken against ESD when opening the equipment.*

RoHS

Global concerns over the health and environmental risks associated with the use of certain environmentally-sensitive materials in electronic products have led the European Union (EU) to enact the Directive on the Restriction of the use of certain Hazardous Substances (RoHS) (2011/65/EU). TKH Security offers products that comply with the EU's RoHS Directive.

Product disposal

The unit contains valuable materials which qualify for recycling. In the interest of protecting the natural environment, properly recycling the unit at the end of its service life is imperative.

When processing the printed circuit board, dismantling the lithium battery calls for special attention. This kind of battery, a button cell type, contains so little lithium, that it will never be classified as reactive hazardous waste. It is safe for normal disposal, as required for batteries by your local authority.

2.2 Cautions

Handle the camera carefully

Do not abuse the camera. Avoid bumping and shaking. The camera can be damaged by improper handling or storage.

Do not disassemble the camera

To prevent electric shock, do not remove screws or covers. There are no user serviceable parts inside. Consult technical support if a camera is suspected of malfunctioning.

Do not exceed the ratings given in the Technical Specifications

Make sure that the power source is appropriate before you plug in and operate the unit. Use the unit under conditions where the temperature remains within the range given in the Technical Specifications of this product. You can download the BC840 datasheet at www.tkhsecurity.com/support-files.

Never face the camera towards the sun

Do not aim the camera at bright objects. Whether the camera is in use or not, never aim it at the sun or other extremely bright objects, as this can damage the camera.

Do not expose indoor models to moisture

The indoor camera model is designed for indoor use or use in locations where it is protected from rain and moisture. Turn the power off immediately if the camera is wet and ask a qualified technician for servicing. Moisture can damage the camera and also create the danger of electric shock.

Do not use strong or abrasive detergents to clean the camera

Use a dry cloth to clean the camera when it is dirty. If the dirt is hard to remove, use a mild detergent and wipe gently. To clean the lens, use lens tissue or a cotton tipped applicator and ethanol. Do *not* clean the lens with strong detergents.

2.3 Compliance

The EU Declaration of Conformity for this product is available for download at www.tkhsecurity.com/support-files.

3 Product overview

This chapter introduces the BC840 and its features.

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3.1 Models

The BC840 series includes the following models.

Model	Description
BC840-MC	Network box camera, 1080p, CMOS, multicodec (H.264/MPEG-4/ MPEG-2/MJPEG)
BC840-MC-XT	Network box camera, 1080p, CMOS, multicodec (H.264/MPEG-4/ MPEG-2/MJPEG), extended temperature
BC840-PID	Network box camera, 1080p, CMOS, dual H.264, Perimeter Intrusion Detection
BC840-PID-XT	Network box camera, 1080p, CMOS, dual H.264, Perimeter Intrusion Detection, extended temperature

Note: The BC840 can be configured to either NTSC or PAL, with the default set to PAL for EMEA and APAC, and to NTSC for the US.

3.2 Features

BC840 Series

Common features

- 1/2.8” Progressive scan CMOS imager
- Full HD 1080p resolution
- ONVIF Profile S
- Day/Night with IR-cut filter
- Wide dynamic range
- Backlight compensation
- Alarm: two inputs / two outputs
- Analogue video output
- Two-way audio
- Up to 10 privacy masks
- 24 Vac; 12 Vdc / 24 Vdc; 802.3af PoE
- SFP Interface (optional)
- SD card slot for edge recording

BC840-MC

Features

- Common features (see above)
- Multicodec, multistream (H.264/MPEG-4/ MPEG-2/MJPEG)

BC840-MC-XT

Features

- Common features (see above)
- Multicodec, multistream (H.264/MPEG-4/ MPEG-2/MJPEG)
- Hardened: -40 °C to +75 °C (-40 °F to +167 °F)

BC840-PID

Features

- Common features (see above)
- Built-in analytics for perimeter intrusion detection (PID)

BC840-PID-XT

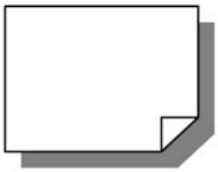
Features

- Common features (see above)
- Built-in analytics for perimeter intrusion detection (PID)
- Hardened: -40 °C to +75 °C (-40 °F to +167 °F)

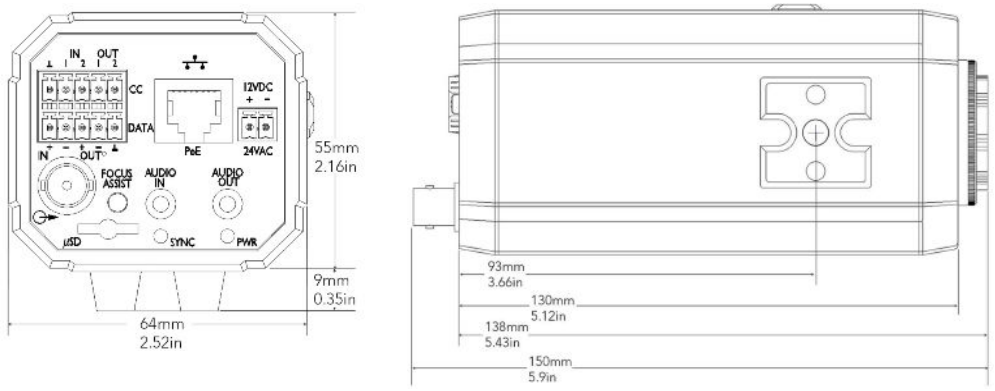
3.3 Package contents

	← lens not included →	
BC840-MC / BC840-PID		*BC840-PID-XT*

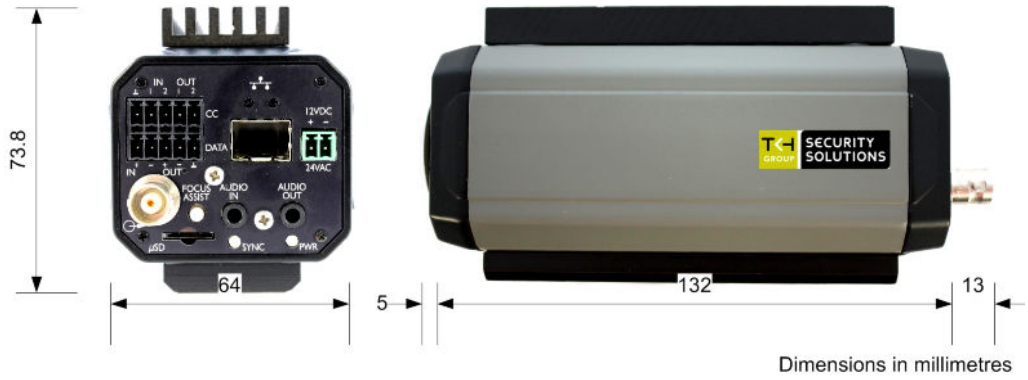
C mount lens adapter	*2-Pin terminal block*	*5-Pin terminal block (2x)*

	
Back focus adjuster	*Quick Start Guide*

3.4 Dimensions



BC840 dimensions



XT model dimensions

4 Back panel

This chapter describes the connectors and other features on the back panel of the BC840.

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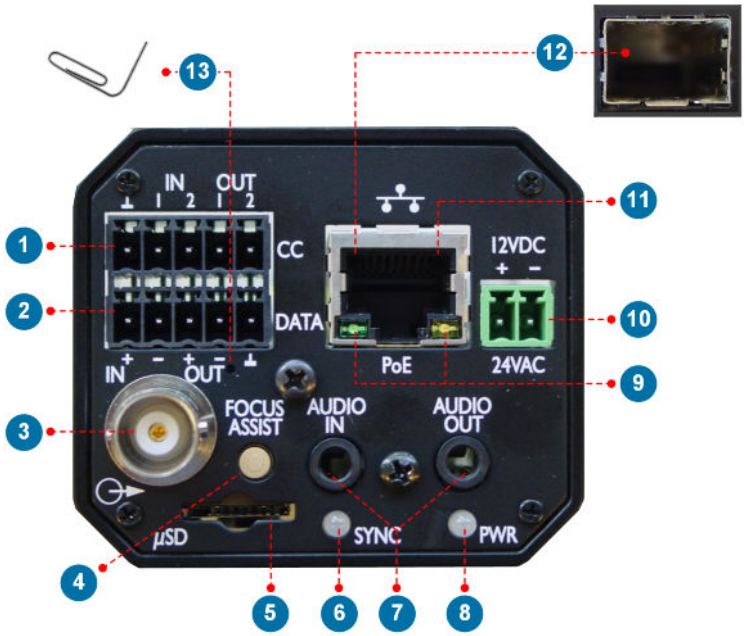
4.1 Features and indications



BC840 back panel

No.	Item	Description	
1	CC IN/OUT	Connector for digital I/O	
		⊥	: GND
		IN 1	: CC IN 1
		IN 2	: CC IN 2
		OUT 1	: CC OUT 1
		OUT 2	: CC OUT 2
2	DATA IN/OUT	Connector for Data RS-422/485	
		IN +	: DATA IN +
		IN -	: IDATA IN -
		OUT +	: DATA OUT +
		OUT -	: DATA OUT -
		⊥	: GND

No.	Item	Description
3	Video (BNC)	Connector for analogue video output
4	FOCUS ASSIST	Activates Focus Assist function. Helps to achieve optimal image quality (see *Appendix: Use focus assist*).
5	Micro SD card slot	Cards up to 32 GB supported.
6	SYNC	Sync LED
7	AUDIO IN / AUDIO OUT	Connectors for two-way audio transmission
8	PWR	Power connection indicator (also used for Focus Assist)
9	Network LEDs	Network connection and activity indicators
10	Power connector	11-30 Vdc / 20-30 Vac
11	Network connector	RJ-45 with 802.3af PoE
12	SFP connector (on SFP model)	Used for direct connection to fiber optic cabling or coax (via TKH Security ECO-plug)
13	Reset button	Press and hold for 10 sec. to reset to factory defaults (incl. network settings).

5 Cable connection

This chapter explains how to connect power and signal cables.

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5.1 Connect audio

The BC840 camera supports two-way audio.

To connect audio

- Connect the audio input and output cables (jack Ø3.5 mm) to the AUDIO IN and AUDIO OUT connectors on the back panel of the camera.

  For information about configuring audio settings via the Audio webpage of the BC840, see the User Manual.

5.2 Connect data RS-485

The BC840 itself does not have PTZ functionality, but it can be mounted on a PTZ mounting bracket which can then be controlled from the data port (RS-422/485) on the back panel of the BC840.

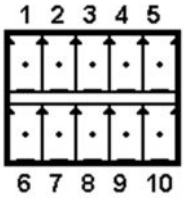
To connect data RS-485

1 Insert the data wiring into the supplied 5-pin terminal block.

  For the connector pin definitions, see the diagram below.

2 Connect the terminal block to the DATA connector.

  For information about configuring data settings via the Data RS-485 webpage of the BC840, see the User Manual.

CC/DATA connector	Data pin definitions	Data specifications
	6. DATA IN + 7. DATA IN – 8. DATA OUT + 9. DATA OUT – 10. GND	• 1x RS-422/485 (2- or 4-wire) • 300 b/s to 230.4 kbps

RS-485 definitions

Note: For 2-wire RS-485 use pins 6 and 7.

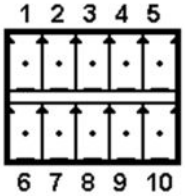
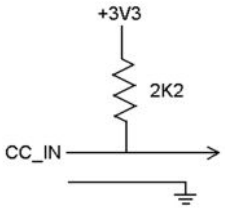
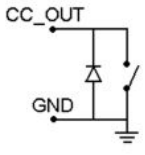
5.3 Connect digital I/O

The BC840 is equipped with two digital inputs and two digital outputs for alarm applications.

To connect alarm devices

1 Insert the alarm wiring into the supplied 5-pin terminal block.
For the connector pin definitions, see the diagram below.

2 Connect the terminal block to the CC connector.
For information about configuring alarm settings via the CC Streams and Event Management webpages of the BC840, see the User Manual.

CC/DATA connector	Equivalent circuits	CC Output specification
 1 GND 2 CC IN 1 3 CC IN 2 4 CC OUT 1 5 CC OUT 2	 *CC input circuit*  *CC output circuit*	• Power transistor output • Max drain current: 1 A • Max voltage: 30 V to GND • ON-resistance: max 20 mΩ

Digital I/O definitions

5.4 Power the camera

BC840 series cameras support 12 Vdc and 24 Vac via terminal block, and Power over Ethernet (802.3af PoE).

To power the camera via terminal block

1 Connect the leads from a 12 Vdc or 24 Vac power supply (not included) to the supplied terminal block in accordance with the connection assignments on the back panel of the camera.
2 Insert the terminal block into the 12 Vdc / 24 Vac connector on the back panel
3 Plug the power supply into a power outlet.

Connection	24 Vac Assignment	12 Vdc Assignment
+	Power-1	Power
—	Power-2	GND

Powering over Ethernet requires that 802.3af PoE power sourcing equipment (PSE) is available on the network. The BC840 consumes 7 W of power.

To power the camera over Ethernet

1 Connect one end of the Ethernet cable to the RJ-45 connector on the back panel of the camera.
2 Connect the other end of the cable to an IEEE 802.3af network switch.

5.5 Connect to network

Category 5 Ethernet cable is recommended for network connections. For the best transmission quality, do not exceed a cable length of 100 metres.

To connect through a hub or switch

- Connect one end of a straight through Cat 5 cable to the RJ-45 connector of the All-in-One cable and the other end of the cable to the network switch.

To connect directly to a PC

- Connect one end of a crossover Cat 5 cable to the RJ-45 connector of the All-in-One cable and the other end of the cable to the PC.

Refer to the following figure to determine whether you have established an Ethernet connection.

Ethernet socket LEDs green/yellow

Green on/off : 100/10 Mbit

Yellow on/blink : link OK, active

Yellow off/flash : link down, TX attempt

5.6 Use the analogue video output

With its analogue output, the hybrid BC840 solution can provide local video for a public view monitor.

To connect a local monitor

- Connect the coaxial cable from your video monitor to the video output BNC connector on the back panel of the BC840.

6 Mount the lens and the camera

This chapter provides instructions for mounting a lens onto the camera. It also explains how to mount the camera on a wall or ceiling.

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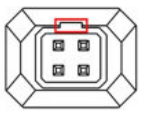
6.1 Mount the lens

The BC840 supports C-mount and CS-mount lenses.

Mount a lens onto the BC840

To mount a lens onto the BC840 camera

1. Remove the CCD cover from the camera.
2. If you have a C-mount lens, attach the supplied C/CS mount adapter to the camera.
3. Screw the lens to the camera or to the adapter.
4. Check for proper back focus and adjust as necessary using the supplied back focus adjuster.
5. Connect the lens connector to the DC Iris socket.
   Align the nub on the lens connector with the indent in the DC Iris socket as highlighted below.



DC Iris socket with indent

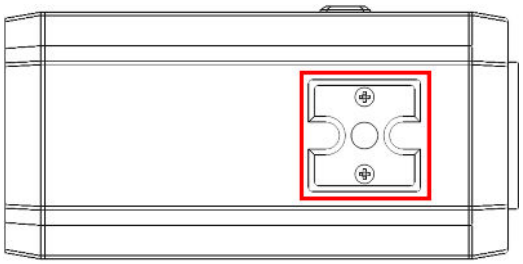
6.2 Mount the camera

The BC840 can be installed directly on a wall or ceiling, provided the surface has sufficient strength to support the camera. In addition, the BC840 is fitted with a mounting block which can be fixed to either the top or bottom of the camera.

The mounting bracket screws directly into the mounting block shown in the figure below. No tools are required. If applicable, also see the installation instructions provided with the various ceiling and wall mounts.

To mount the camera upside-down

1 Using a Phillips-head screwdriver, remove the mounting block (shown below) from the camera.
2 Affix the mounting block to the opposite side of the camera.
3 Mount the camera to the bracket.



BC840 with mounting block

6.3 BC840-PID-XT Installation guidelines

The BC840-PID-XT is a temperature-hardened HD box camera with Perimeter Intrusion Detection. The camera has been designed to function properly within a temperature range of -40 °C to 75 °C. We strongly advise you to observe the following guidelines when you install the camera.

To get the best performance and endurance out of your BC840-PID-XT

- Ensure that the bottom surface of the camera makes optimal contact with the bracket it is installed on.
  This helps the housing to dissipate part of the heat generated by the camera.
- Install the camera at a minimum height of three metres above ground level.
  This makes the camera less susceptible to heat reflected from the ground.
- Install the camera with a proper sunshield.
  This prevents the sun from heating the camera housing directly.
- Raise the sunshield to at least 1 cm above the camera housing.
  This generates an air flow between the sunshield and the top of the camera housing, allowing the housing to dissipate heat to the air.

6.4 PID Camera installation

Before the BC840-PID functionality can be set up through the PID webpage, it is imperative to make sure that the camera is properly installed for PID application.

Installing cameras and lighting for surveillance purposes requires specific professional skills. The requirements for camera images processed with automatic PID functionality differ significantly from the requirements for images monitored by human observers.

For example, in conventional surveillance camera setups, the camera is often aligned such that it provides a clear overview of the entire site, including a natural horizon showing some of the sky. For PID purposes, however, the only relevant part of that image is the detection zone. All other parts of the image are irrelevant and can decrease PID sensitivity, because they leave fewer pixels for the objects within the detection zone, thus potentially leading to degraded detection performance.

Also, for example, a bright sky or a bright street light in the image causes the Automatic Gain Control (AGC) of the camera to adjust, leaving a darker image in which objects are to be detected.

Warning: For optimal PID performance and a stable and reliable detection system, it is essential that installers meticulously follow the detailed installation instructions and lighting guidelines provided in TKH Security's *PID Camera Installation* application note.

7 System

This chapter gives the system requirements for PCs used to access the BC840.

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7.1 System requirements

You can log on to the web interface of your BC840 unit from a PC which is on the same subnet as the unit. The browsing PC must meet the system requirements given in the table below and the browser must support ActiveX controls. Make sure that your PC has a good network connection.

Item	System requirement
Personal computer	**Minimum** 1. Intel® Core™ i5-2430M @ 2.4 GHz 2. 4 GB RAM
	Recommended 1. Intel® Core™ i7-870 @ 2.93 GHz 2. 8 GB RAM
Operating system	Windows 7 or higher
Web browser	Support for latest two versions of: Internet Explorer, Chrome, Firefox, Safari
Network card	10Base-T (10 Mbps), 100Base-TX (100 Mbps) or 1000Base-T (1000 Mbps) operation
Viewer	ActiveX control plug-in for Microsoft IE

7.2 System compatibility

To ensure system compatibility, download the latest firmware from www.tkhsecurity.com/support-files.

Appendix: Use focus assist

BC840 includes Focus Assist functionality to achieve optimal image quality. Focus Assist can be used from the Video page but also from the back of the camera body. The latter may prove useful when setting the focus without a monitor.

To use Focus Assist from the webpage

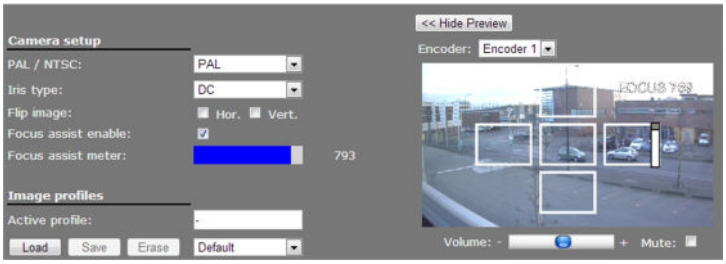
1 On the **Video** page, select the **Image** tab.

2 Under *Camera setup*, select **Focus assist enable**.

The focus level is indicated by the blue *Focus assist meter* bar. The meter is also overlaid over the image as a vertical white bar.

3 Aided by the feedback from the Focus assist meter, adjust the focus on the lens.

The greater the detail in the scene, the higher the number on the Focus assist meter.



Focus assist meter enabled

To use Focus Assist from the camera body

1 To activate Focus Assist, turn the focus ring of the lens all the way in one direction, and then press the white button on the back of the camera housing.

The Focus LED - also on the back of the housing - shines orange, indicating that Focus Assist has not registered a maximum sharpness value yet.

2 Slowly turn the focus ring of the lens until the LED shines red.

3 Next, turn back the focus ring to find the point where the Focus LED shines green.

This is the point where the camera is properly focused.

LED state	Indicates	Action
Orange	Focus Assist has not registered a maximum focus value yet.	Turn the focus ring of the lens all the way from left to right until a maximum value is seen.
Red	Focus Assist has registered a maximum focus value, but is not properly focused yet.	Slowly turn the focus ring until the Focus LED shines green.
Green	The camera is properly focused.	None

Appendix: Adjust back focus

Back focus refers to the distance from the rear lens element to the camera focal plane. It is only necessary to adjust the back focus if the lens of the camera cannot hold focus throughout its zoom range.

Required tools

- Back focus adjuster (in the BC840 camera package)
- Test chart / contrasting object

To adjust back focus

1. Set the camera on a stable mount at least 75 feet (23 metres) away (or as far as possible) from the test chart or object.
2. Make sure the iris is wide open and keep the lighting as low as possible.
3. Adjust the focus to infinity, indicated on the camera by the ∞ symbol.
4. Turn the zoom to the extreme telephoto position, and then focus on the subject.
5. Set the zoom to the wide-angle position.
6. Loosen the retaining screw of the back focus ring with the supplied back focus adjuster, and then adjust the back focus ring to sharpen the picture.
7. Repeat steps 3 ~ 6 until the focus remains consistent throughout the zoom range.
8. Tighten the retaining screw of the back focus ring to fasten the ring.

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