MIC612 Thermal Camera

MIC612

BOSCH

en   Operation Manual

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1   Safety

1.1   About this Manual

This manual has been compiled with great care and the information it contains has been thoroughly verified. The text was complete and correct at the time of printing. Because of the ongoing development of products, the content of the manual may change without notice. Bosch Security Systems accepts no liability for damage resulting directly or indirectly from faults, incompleteness, or discrepancies between the manual and the product described.

1.2   Legal Information

Copyright

This manual is the intellectual property of Bosch Security Systems, Inc. and is protected by copyright. All rights reserved.

Trademarks

All hardware and software product names used in this document are likely to be registered trademarks and must be treated accordingly.

1.3   Safety Precautions

In this manual, the following symbols and notations are used to draw attention to special situations:

Danger!

High risk: This symbol indicates an imminently hazardous situation such as "Dangerous Voltage" inside the product. If not avoided, this will result in an electrical shock, serious bodily injury, or death.

Warning!

Medium risk: Indicates a potentially hazardous situation. If not avoided, this may result in minor or moderate injury.

Caution!

Low risk: Indicates a potentially hazardous situation. If not avoided, this may result in property damage or risk of damage to the unit.

Notice!

This symbol indicates information or a company policy that relates directly or indirectly to the safety of personnel or protection of property.

1.4   Important Safety Instructions

Read, follow, and retain all of the following safety instructions. Heed all warnings on the unit and in the operating instructions before operation.

Caution!
TO REDUCE THE RISK OF ELECTRIC SHOCK, DISCONNECT THE POWER SUPPLY BEFORE OPENING THE POWER SUPPLY UNIT.
POWER DISCONNECT: POWER SUPPLY UNITS HAVE POWER SUPPLIED WHENEVER THE POWER CORD IS INSERTED INTO THE POWER SOURCE.

Warning!
INSTALLATION SHOULD BE CARRIED OUT BY QUALIFIED PERSONNEL ONLY, IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE, ANSI/NFPA, CANADIAN ELECTRICAL CODE, AND ALL LOCAL COUNTRY CODES.

Warning!
INSTALL EXTERNAL INTERCONNECTING CABLES IN ACCORDANCE TO NEC, ANSI/NFPA70 (FOR US APPLICATION) AND CANADIAN ELECTRICAL CODE, PART I, CSA C22.1 (FOR CAN APPLICATION) AND IN ACCORDANCE TO LOCAL COUNTRY CODES FOR ALL OTHER COUNTRIES. BRANCH CIRCUIT PROTECTION INCORPORATING A 20 A, 2-POLE LISTED CIRCUIT BREAKER OR BRANCH RATED FUSES ARE REQUIRED AS PART OF THE BUILDING INSTALLATION. A READILY ACCESSIBLE 2-POLE DISCONNECT DEVICE WITH A CONTACT SEPARATION OF AT LEAST 3 mm MUST BE INCORPORATED.

Warning!
ROUTING OF EXTERNAL WIRING MUST BE DONE THROUGH A PERMANENTLY EARTHED METAL CONDUIT.

Warning!
THE CAMERA MUST BE MOUNTED DIRECTLY AND PERMANENTLY TO A NON-COMBUSTIBLE SURFACE.

- Do not place a canted (45°) camera upright; it can fall over easily. Place the canted camera on its side.
- Do not open the camera unit. Doing so will invalidate the warranty.
- Ensure that the unit case is properly earthed. If the product is likely to be struck by lightning, ensure that earth bonding connections are made correctly to the mounting of the base of the unit.
- Do not point the camera at the sun. Bosch Security Systems will not be liable for any damage to cameras that have been pointed directly at the sun.
- Do not manually back drive the pan or tilt axis of the camera. Doing so will damage the motor drive gear train and will invalidate the warranty.
- Before transporting, power on the camera and rotate the ball so that the window points toward the base. This will help to protect the wiper and the window during transit.

1.5 Customer Support and Service

If this unit needs service, contact the nearest Bosch Security Systems Service Center for authorization to return and shipping instructions.

Service Centers

USA

Telephone: 800-366-2283 or 585-340-4162

Fax: 800-366-1329

Email: cctv.repair@us.bosch.com

Customer Service

Telephone: 888-289-0096

Fax: 585-223-9180

Email: security.sales@us.bosch.com

Technical Support

Telephone: 800-326-1450

Fax: 585-223-3508 or 717-735-6560

Email: technical.support@us.bosch.com

Repair Center

Telephone: 585-421-4220

Fax: 585-223-9180 or 717-735-6561

Email: security.repair@us.bosch.com

Canada

Telephone: 514-738-2434

Fax: 514-738-8480

Europe, Middle East & Africa Region

Please contact your local distributor or Bosch sales office. Use this link:

http://www.boschsecurity.com/startpage/html/europe.htm

Asia Pacific Region

Please contact your local distributor or Bosch sales office. Use this link:

http://www.boschsecurity.com/startpage/html/asia_pacific.htm

More Information

For more information please contact the nearest Bosch Security Systems location or visit www.boschsecurity.com

2   Unpacking

– This equipment should be unpacked and handled with care. Check the exterior of the packaging for visible damage. If an item appears to have been damaged in shipment, notify the shipper immediately.
– Verify that all the parts listed in the Parts List below are included. If any items are missing, notify your Bosch Security Systems Sales or Customer Service Representative.
– Do not use this product if any component appears to be damaged. Please contact Bosch Security Systems in the event of damaged goods.
– The original packing carton is the safest container in which to transport the unit and must be used if returning the unit for service. Save it for possible future use.

> ⚠ **Caution!**
> Take extra care lifting or moving MIC612 cameras because of their weight (10.66 kg (23.5 lb)).

2.1   Parts List

Quantity	Part
1	MIC550 Camera
1	Installation Manual
4	M8 stainless screws and washers
1	Nebar gasket

Quantity	Part
1	MIC550IR Camera
1	Installation Manual
4	M8 stainless screws and washers
1	Nebar gasket

Quantity	Part
1	MIC612 Camera
1	Installation Manual
4	M8 stainless screws and washers
1	Nebar gasket

2.2   Additional Products Required

Mounting accessories are sold separately by Bosch. (Refer to the chapter Product Description for a list.) Users must supply all wiring/cabling for power, video, and telemetry.
The following table lists additional products, sold separately by Bosch, required to operate each MIC camera:

Quantity	Product	Part Number	Size
1 per camera	Shielded Composite Cable for MIC612 cameras (See the model numbers and lengths at right.)	MIC-THERCBL-2M	2 m
		MIC-THERCBL-10M	10 m
		MIC-THERCBL-20M	20 m
		MIC-THERCBL-20M	25 m

Quantity	Product	Part Number
1 per camera	Power Supply Unit (PSU) for MIC cameras	MIC-240PSU-2, MIC-115PSU-2, MIC-24PSU-2

2.3   Additional Tools Required

The following table lists additional tools (not supplied by Bosch) that are or may be required to install a MIC camera:

Quantity	Part
1	13 mm wrench for the mounting bolts
1	3 mm screwdriver for the terminal blocks in the MIC PSU
1	8 mm screwdriver for captive screws for the MIC PSU enclosure
1	Silicone sealant for ensuring a water tight seal [if not using the Nebar gasket]
1	Roll of PTFE tape

3   Product Description

MIC Series 612 cameras are high-performance, weatherproof, ruggedized, fully functional day/night PTZ cameras that have been designed to offer a reliable, robust, and high-quality surveillance solution for extreme security applications.

MIC612 models have a 36x optical zoom (12x digital) and flexible mounting options (upright or inverted) to achieve the perfect field of view.

Precision-engineered to exacting standards, MIC cameras offer numerous benefits over traditional dome and PTZ cameras. Rated to an industry-leading IP68, the compact, vandal-resistant, cast aluminum camera housing is pre-treated and then painted with polyester powder coat paint (black, white, or grey). Brushless motor technology ensures ultra-reliable operation with full 360° continuous pan and up to 320° tilt control. The optically perfect, flat viewing window and integrated wiper ensure that razor-sharp images are captured in even the most demanding environmental conditions.

A long-life silicone wiper blade mounted on a spring-loaded arm is standard on all MIC cameras.

The following table identifies the optional accessories for MIC cameras. Refer to the datasheets of each accessory for details. Some accessories may not be available in all regions.

Accessories	Description
MIC-DCA	Deep Conduit Adapter
MIC-SCA	Shallow Conduit Adapter
MIC-CMB	Corner Mount Bracket
MIC-PMB	Pole Mount Bracket
MIC-WMB	Wall Mount Bracket
MIC-SPR	Spreader Plate

MIC-ALM	Alarm and washer pump drive card for non-IR PSU; 8 inputs.

MIC-WKT	Washer kit, containing mounting bracket, nozzle, and washer pump drive card.

MIC-BP4	Bosch Biphase converter card for MIC power supplies **with** an available expansion slot.

MIC412SUNSHIELD	A two-part plastic sunshield to provide additional protection in sunny climates for MIC cameras Comes with stainless steel bosses, washers, and retaining screws.

4   Electrical Connections

4.1   About the MIC Shielded Composite Cable

All connections (power, telemetry, video) to the MIC camera are provided through the screw terminal connections in the MIC power supply. MIC shielded composite cables are multi-conductor cables of various lengths (and gauges ranging from 14 - 18) that provide all power, video, and telemetry connections between the MIC PSU and the MIC camera. The cables are pre-made with a female terminated connector (14-pin) at one end for attachment to the male connector installed into the base of the camera. The other end of the cables has free (non-terminated) wires for wiring into terminals in the MIC PSU. The composite cable consists of two pairs (24AWG) plus 4 cores of (22 AWG), 2 cores of (24 AWG), and one coax core for the video signal to a maximum distance of 25 m.

> **Notice!**
> Bosch Security Systems does not recommend using the shielded composite cable for distances greater than 25 m between the MIC camera and the MIC power supply.

For installations that require the camera to be more than 25 m from the power supply, Bosch recommends that a 2 m cable be connected to a junction box (Exd rated for MIC440) from which telemetry, video, and power can be broken out into separate cables and appropriate wiring used to extend the distance to suit.

> **Warning!**
> Bosch recommends connecting the cable to the unit before taking the unit for mounting on-site.
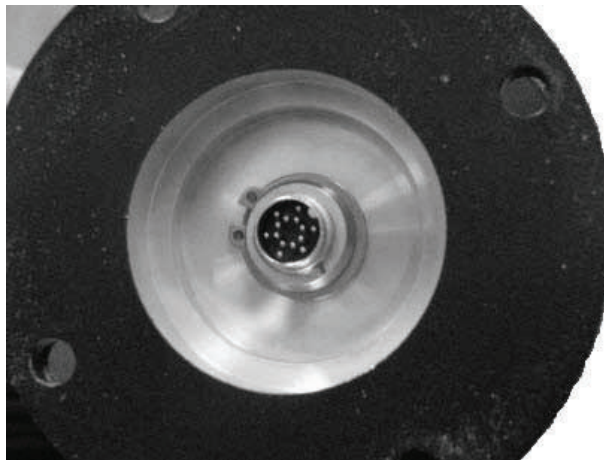
Figure 4.1: MIC shielded composite cable connection before cable is connected to a MIC612 camera
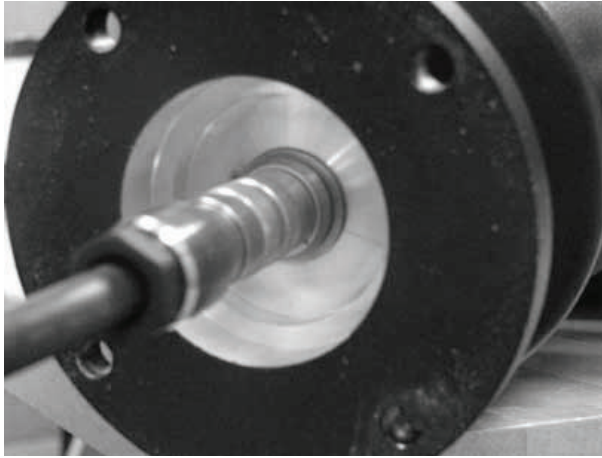
Figure 4.2: MIC shielded composite cable connected to a MIC612 camera

4.2   Composite Cable Color-coding

The standard color coding used in MIC composite cables is as follows:
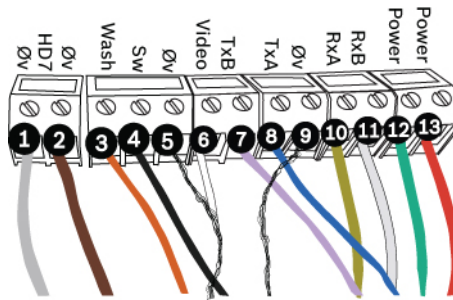
Figure 4.3: Exploded View of Composite Cable Connections

Camera Cable Connector Pin	Signal Name	Description	Cable Wire Color
1	Washer Drive Rtn	Auxiliary Connection	Grey
2	Tamper Sw Rtn	Auxiliary Connection	Brown
3	Washer Drive	Wash Signal	Orange
4	Tamper Sw	Alarm Communications	Black
5	Video Return	Video Signal Ground	Coax Screen
6	Video Output	Video Output to Control Room	Coax Core
7	Full Duplex Tx B+	Telemetry I/O to RS-422/485	Violet
8	Full Duplex Tx A-	Telemetry I/O to RS-422/485	Blue
9	0v	Ground	Shield
10	Full Duplex Rx A- Half Duplex Tx/Rx A	Telemetry I/O to RS-422/485	Yellow

Camera Cable Connector Pin	Signal Name	Description	Cable Wire Color
11	Full Duplex Rx B+ Half Duplex Tx/Rx B	Telemetry I/O to RS-422/485	White
12	Power Input 2	Low Voltage Power Input	Green
13	Power Input 1	Low Voltage Power Input	Red

5   Install the MIC (standard) PSU

5.1   MIC PSU Overview

Caution!
Use only the power supply specified for your specific model of camera.

Bosch provides a range of power supply units (PSUs) for MIC Series cameras. These units have a variety of common voltages and provide all the connections needed for power, telemetry and video.

Model Number	Input Voltage	Dimensions (H x W x D)	Weight
MIC-24PSU-2	24 VAC	90 x 260 x 160 mm (3.54 x 10.24 x 6.3 in.)	3.2 kg (7.1 lb)
MIC-115PSU-2	115 VAC	90 x 260 x 160 mm (3.54 x 10.24 x 6.3 in.)	3.2 kg (7.1 lb)
MIC-240PSU-2	230 VAC	90 x 260 x 160 mm (3.54 x 10.24 x 6.3 in.)	3.2 kg (7.1 lb)

Table 5.1: PSUs for MIC612

Each MIC PSU provides all of the connections needed for power, video, and telemetry for a single MIC camera. Each MIC PSU has CE and FCC approval and has a cast-aluminum enclosure that is weather-resistant (rated IP65). Features include:
– A provision for driving various optional interface cards mounted internally to the MIC power supply enclosure (for example, an 8-input alarm card (MIC-ALM))
– A provision for a signal interface card (MIC-BP4) to connect telemetry to Bosch Biphase equipment
– Screw termination of all cables (composite, telemetry, and ancillary) into and out of the enclosure
– Earth isolation and termination within the unit to control video earthing correctly and thus prevent earth loops
Each MIC PSU ships with the following parts:
– Three (3) M12 cable glands for telemetry, video and ancillary equipment
– One (1) M16 gland for connection of the shielded composite cable to the MIC camera
– One (1) 1/2 in. NPT cable gland for the power cable connection
– One (1) 1/2 in. NPT and one (1) M12 blanking plug

5.2   About the MIC Shielded Composite Cable

All connections (power, telemetry, video) to the MIC camera are provided through the screw terminal connections in the MIC power supply. MIC shielded composite cables are multi-conductor cables of various lengths (and gauges ranging from 14 - 18) that provide all power, video, and telemetry connections between the MIC PSU and the MIC camera. The cables are pre-made with a female terminated connector (14-pin) at one end for attachment to the male connector installed into the base of the camera. The other end of the cables has free (non-

terminated) wires for wiring into terminals in the MIC PSU. The composite cable consists of two pairs (24AWG) plus 4 cores of (22 AWG), 2 cores of (24 AWG), and one coax core for the video signal to a maximum distance of 25 m.

	Notice!
i	Bosch Security Systems does not recommend using the shielded composite cable for distances greater than 25 m between the MIC camera and the MIC power supply.

For installations that require the camera to be more than 25 m from the power supply, Bosch recommends that a 2 m cable be connected to a junction box (Exd rated for MIC440) from which telemetry, video, and power can be broken out into separate cables and appropriate wiring used to extend the distance to suit.

	Warning!
⚠	Bosch recommends connecting the cable to the unit before taking the unit for mounting on-site.

Figure 5.1: MIC shielded composite cable connection before cable is connected to a MIC612 camera
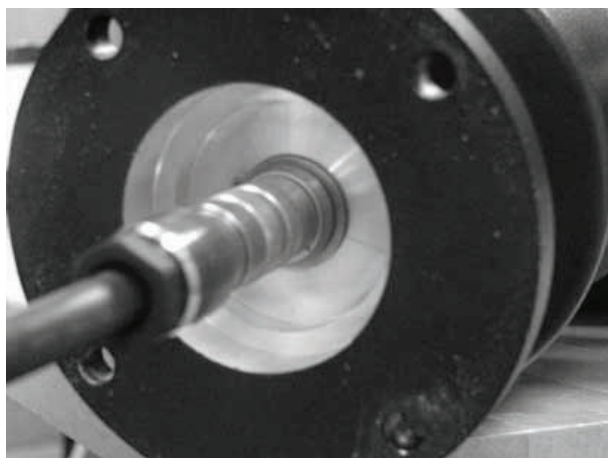
Figure 5.2: MIC shielded composite cable connected to a MIC612 camera

5.3   Composite Cable Color-coding

The standard color coding used in MIC composite cables is as follows:
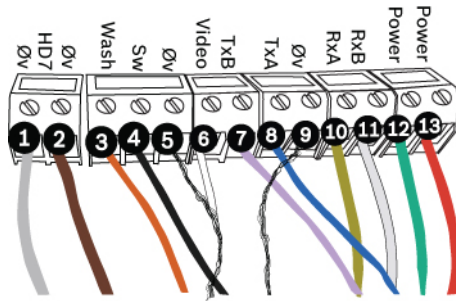
Figure 5.3: Exploded View of Composite Cable Connections

Camera Cable Connector Pin	Signal Name	Description	Cable Wire Color
1	Washer Drive Rtn	Auxiliary Connection	Grey
2	Tamper Sw Rtn	Auxiliary Connection	Brown
3	Washer Drive	Wash Signal	Orange
4	Tamper Sw	Alarm Communications	Black
5	Video Return	Video Signal Ground	Coax Screen
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7	Full Duplex Tx B+	Telemetry I/O to RS-422/485	Violet
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9	0v	Ground	Shield
10	Full Duplex Rx A- Half Duplex Tx/Rx A	Telemetry I/O to RS-422/485	Yellow
11	Full Duplex Rx B+ Half Duplex Tx/Rx B	Telemetry I/O to RS-422/485	White
12	Power Input 2	Low Voltage Power Input	Green
13	Power Input 1	Low Voltage Power Input	Red

5.4   Earth Link on PCB

The printed circuit board (PCB) of each MIC PSU (IR and non-IR) has one Earth Link option, near terminal block HD1, to allow the PSU to be set up for different earthing schemes:

– If there is a separate connection between video screen and earth, the Earth Link should be broken. This usually occurs on copper-connected systems where all of the copper video coaxes are taken back to the control room to be connected to a central earth point.

– If fiber optics or other indirect connections are used to get data and video to and from the control room, then the Earth Link should be left intact, as long as it is the only camera-end earth reference point.

5.5   Fuse Ratings

The MIC PSUs for MIC612 cameras have four (4) off 20 mm fuses (numbers 13 - 16 in the figure "Layout of MIC-240PSU-2 and MIC-115PSU-2") in fuse holders. The ratings for these fuses are fixed on the low voltage secondary side but change with input voltage on the high voltage primary side. The following table shows the fuse values that should be fitted to provide proper protection for the MIC-240PSU-2 and MIC-115PSU-2 power supplies. **Note:** FS 4 does not exist.

Fuse ID	Fuse Function	Type	Rating for 240 V Primary	Rating for 115 V Primary	Rating for 24 V Primary
FS 1	MIC camera protection	Glass	1.6 A anti-surge (T)	1.6 A anti-surge (T)	1.6 A anti-surge (T)
FS 2	Primary protection	Glass	200 mA quick blow	500 mA quick blow	2.5 A quick blow
FS 3	Heater protection 1	Glass	1.6 A anti-surge (T)	1.6 A anti-surge (T)	1.6 A anti-surge (T)
FS 5	Heater protection 2	Glass	1.6 A anti-surge (T)	1.6 A anti-surge (T)	1.6 A anti-surge (T)

5.6   Alarm Inputs

The table below identifies the number of alarm inputs and outputs available in MIC power supply units, depending on whether or not an 8-input alarm card is installed.

MIC PSU	8-input Alarm Card (MIC-ALM)?	Number of Alarm Inputs	Number of Alarm Outputs
MIC-24PSU-2, MIC-115PSU-2, MIC-240PSU-2	No	1	0
	Yes	8	2

Table 5.2: Number of alarm inputs and outputs in MIC PSUs

5.7   Layout of MIC Power Supply Units (PSUs)

Layout of MIC-240PSU-2 and MIC-115PSU-2
The figure below displays the layout of the PCB in the MIC PSUs for non-IR cameras, with call-out numbers to the side of or below the connection/terminal ID or the terminal, and 'on' the fuses. The table below the figure identifies the connections.
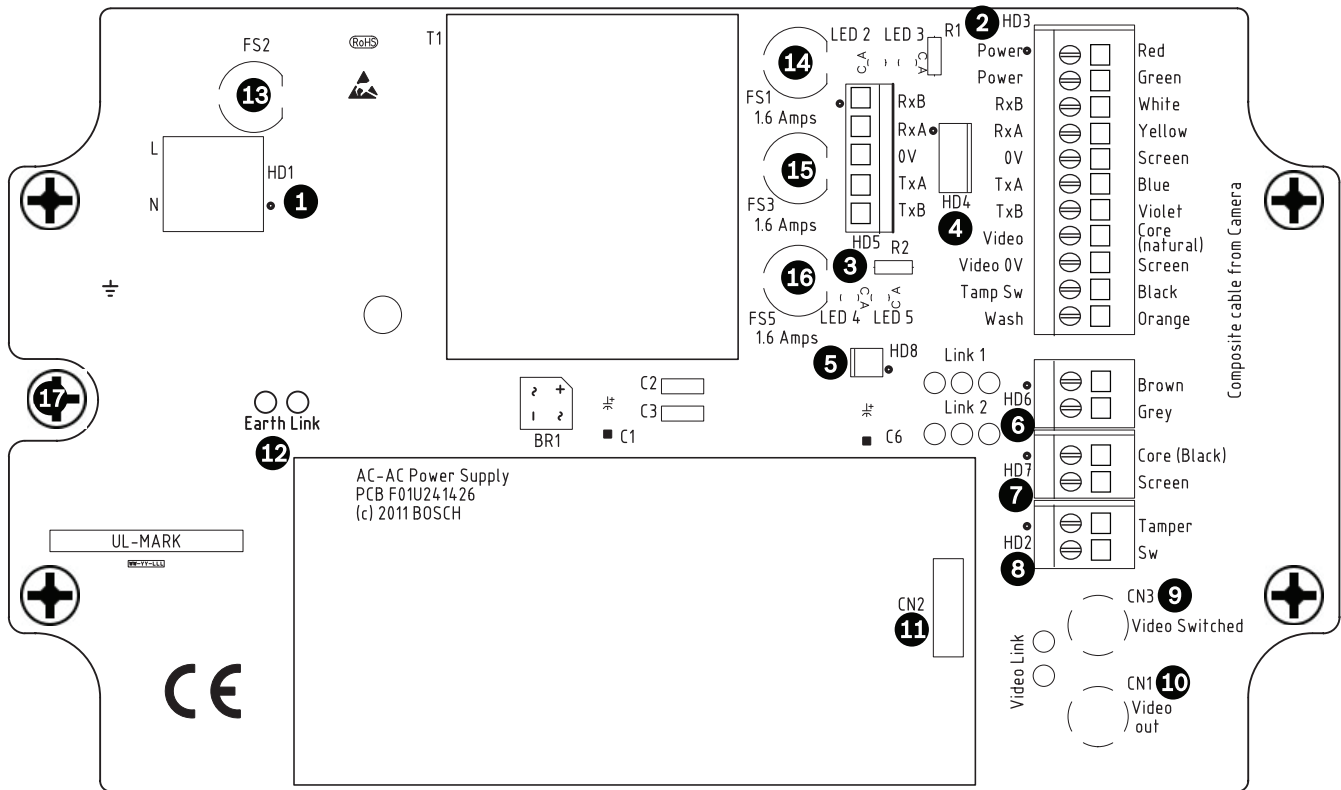
Figure 5.4: Layout of MIC-240PSU-2 and MIC-115PSU-2

No.	PCB Marking	Description/Function of Connection / Terminal	Type of Connection/ Terminal
1	HD1	AC Power input connector Live (HD1-1); Neutral (HD1-2) [Ground wire connects to earth termination post	Screw terminal
2	HD3	Shielded composite cable header (connections to camera)	Screw terminal
3	HD5	RS-485 control header	Screw terminal
4	HD4	Telemetry header	Molex connector
5	HD8	USB to RS-485 converter *[Not used for MIC440.]*	Molex connector
6	HD6	[Optional] Auxiliary, heater *[Not used for MIC440.]*	Screw terminal
7	HD7	Video (composite cable)	Screw terminal
8	HD2	Tamper switch header	Screw terminal
9	CN3 Video Switched	Coax connection (Switched visible/thermal video out) *[Not used for MIC440.]*	BNC socket
10	CN1 Video Out	Coax connection header (Visible video out)	BNC socket
11	CN2	Auxiliary / add-on card terminal	Plug in
12	Earth Link	Earth Link	

No.	PCB Marking	Description/Function of Connection / Terminal	Type of Connection/ Terminal
13	FS2	Fuse 2 - Primary protection	--
14	FS1	Fuse 1 - MIC camera protection	--
15	FS3	Fuse 3 - Heater protection 1	--
16	FS5	Fuse 5 - Heater protection 2	--
17	--	Earth termination post	Ring terminal

5.8 Installation Warnings and Prerequisites

Danger!

ELECTRICAL SHOCK HAZARD

To reduce the risk of electrical shock, disconnect power before opening or working on any power supply unit. Power must be disconnected before replacing any fuse in the MIC PSU. Power supply units have power supplied whenever the power cord is inserted into the power source.

MIC PSUs have a separate internal shield covering the power cable input terminal block (HD1). Only suitably qualified persons should remove this shield and connect the mains power cable. The shield MUST be re-installed and fully secured before connecting the power.

The power supply cable shall have conductors of a maximum size of 12 AWG.

Branch circuit protection incorporating a 15 A, 2-pole, listed circuit breaker or branch rated fuses are required. A readily accessible 2-pole disconnect device with a contact separation of at least 3mm must be incorporated externally to the equipment.

Warning!

To meet UL standards and ratings, all external wires (power and I/O cabling) for installation applications to the device **must be** routed separately through different permanently earthed metal conduits (not supplied).

Notice!

Use only UL-listed liquid tight strain reliefs for conduits to the power supply box to ensure that water cannot enter the box. You must use watertight conduits and fittings to meet NEMA 6P or to maintain IP68 standards.

Notice!

MIC PSU enclosures are not EXD rated and must be replaced with a **certified** enclosure if installed within a hazardous area.

Caution!

Except for the Earth Link, heater links, and applicable fuses, the MIC PSUs have no user-adjustable parts. MIC cameras have no user-serviceable parts.

> **Notice!**
>
> Do not connect MIC IR units to a MIC PSU with the heater option enabled as this can damage the cameras. Ensure that an IR power supply is used with a MIC IR camera unit. Heaters are available for MIC612 cameras only.

> **Caution!**
>
> Bosch recommends using an uninterruptible power supply (UPS) in connection with a MIC camera/PSU installation.

> **Notice!**
>
> To maintain the IP rating of the power supply enclosure, install only listed or recognized conduit hubs or fittings with the same environmental rating as the enclosure in compliance with the installation instruction of the hub or fitting.

> **Notice!**
>
> Refer to the *MIC Series Power Supply Installation Manual* included with the PSU for full details on installing a MIC Series PSU and connecting to a MIC Camera.

5.9   Installation Instructions (Power Supply)

To install the power supply unit (PSU), follow these steps:

1. Select a secure installation location for the PSU. Ideally, this is a location where the device cannot be interfered with either intentionally or accidentally.

Bosch recommends using an environmentally suitable, lockable equipment cabinet.

2. Loosen the four (4) captive Phillips head screws on the top of the lid of the power supply enclosure. Lift the lid and set it upside down next to the enclosure.

> **Notice!**
>
> Do not stretch or cut, or otherwise disturb, the earth core cable (shown in the figure below) to the inside of the lid and to the earth termination post.

3. Locate the four (4) mounting holes of the power supply enclosure.
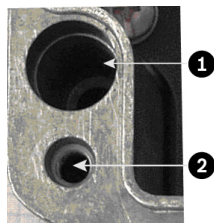
Figure 5.5: Holes for screws for mounting enclosure mounting; holes for screws for enclosure lid

Number	Description
1	Hole for mounting screw in enclosure
2	Hole for lid screw in enclosure

4. Drill four (4) holes in the mounting surface for the mounting anchors appropriate for M6 screws (not supplied).

5. Secure the enclosure to the mounting surface using four (4) M6 stainless steel screws and washers (not supplied), which fit through the large holes in the enclosure.

Notice!
If you are securing the power supply enclosure in a vertical position (for example, on a wall), one person should hold the enclosure lid while another secures the enclosure body in place, to avoid damage to any part of the enclosure, and/or injury to the installer(s).

6. Unscrew the two (2) M3 screws on the internal high voltage input head-end shield (marked with "Danger") covering the mains cable terminal HD1; retain the screws.
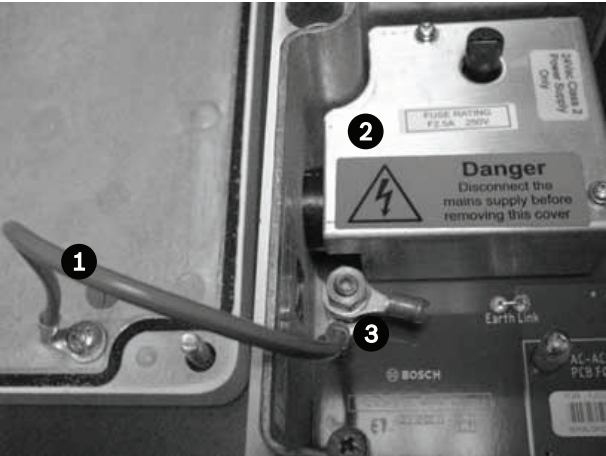
Figure 5.6: Enclosure showing shield and earth core cable between earth terminal post and enclosure lid

Number	Description
1	Earth core cable to enclosure lid
2	Internal shield
3	Earth termination post

7. Remove the internal shield and set it nearby, outside of the PSU enclosure. You can now access the hole for the power cable and the M20 blanking plug covering the hole.
8. Remove the blanking plug covering the hole for the power cable. Install suitable (metal) conduit (not supplied) in the hole. Secure the conduit as recommended by the conduit manufacturer.

Caution!
Only installations with conduit meet UL standards. If you choose to use a power cord without conduit (not recommended), fit the 1/2 in. NPT cable gland (supplied) in place of the blanking plug. Note: It is easier to fit the power cord through the cable gland outside of the enclosure, and then attach the gland to the enclosure. Ensure that the cable glands have sufficient room to allow for the cables to enter (approximately 60 mm on either side of the enclosure).

9. Prepare the power cable as needed, and then feed the cable into the enclosure.
10. Connect the Live and Neutral cores to the correct screw terminals on terminal block HD1 as identified in the table below and printed on the PCB. Observe polarity and voltage.

PCB Marking	Description
L	Live
N	Neutral
⏚	Earth / Ground

11. Remove the brass nut and copper washer from the earth termination post (item 3 in the figure "Mains input with shield removed..."); set these aside.

12. Remove the ring terminal (supplied).

13. Insert the earth core from the mains cord (item 2 in the figure "Mains input with shield removed...") into the crimp portion (size M6, UL-certified) of the ring terminal and crimp it in place.

14. Place the ring terminal onto the earth termination post.

15. Replace the copper washer. Secure with the brass nut.
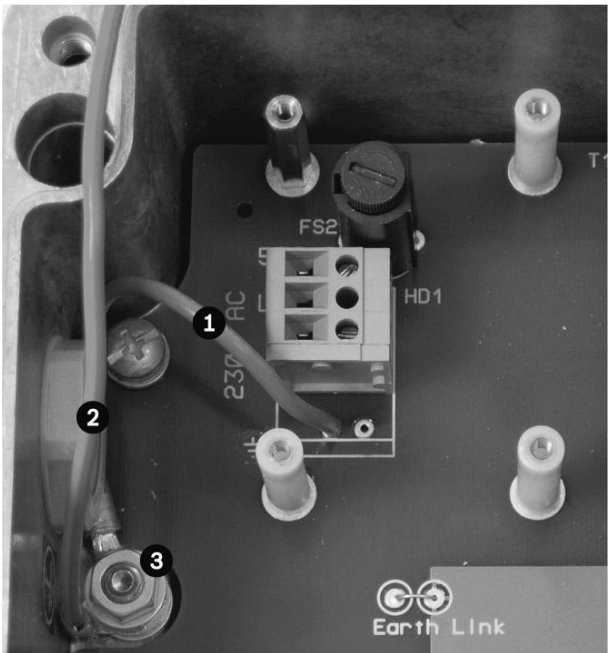
Figure 5.7: Mains input with shield removed, showing terminal block HD1 before wiring

Number	Description
1	Earth core cable to enclosure lid
2	Earth core cable to power supply PCB
3	Earth termination post

16. Replace the internal shield, taking care to avoid pinching the cables. Tighten the screws.

17. Feed the unconnected end of the shielded composite cable through the top-right M16 cable gland (item 2 in the figure "MIC PSU Enclosure, with cable glands identified").
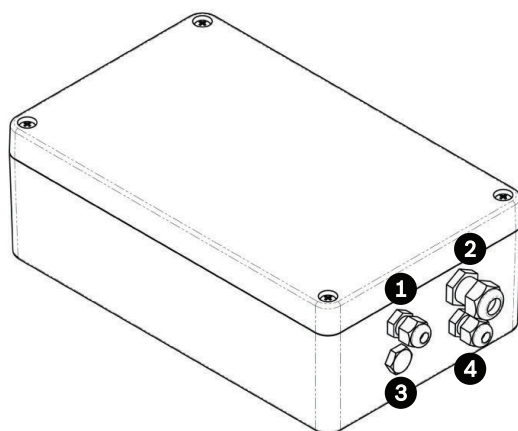
Figure 5.8: MIC PSU Enclosure, with cable glands identified

Number	Description	Cable Gland Size
1	Optical Video out	M12
2	Composite cable	M16
3	Optional switched video output	M12
4	Head-end / Telemetry controls	M12

18. Connect the shielded composite cable to terminal block HD3 (and, if necessary, HD6 and HD7) following the color coding as shown in the figure below, and printed on the PCB.

No.	ID, Connection/ Terminal + Pin	PCB Mark, Signal	Description/Function of Connection	PCB Mark, Cable Color
1	HD3-1	Power	Low Voltage Power (Input 1) / AC supply	Red
2	HD3-2	Power	Low Voltage Power (Input 2) / AC supply return	Green
3	HD3-3	RxB	Telemetry I/O to RS-422/485 [Rx +] Full Duplex RxB/Half Duplex Tx/RxB	White
4	HD3-4	RxA	Telemetry I/O to RS-422/485 [Rx -] Full Duplex RxA/Half Duplex Tx/RxA	Yellow
5	HD3-5	0v	Ground [Drain Wire / Shield]	Screen (Black)
6	HD3-6	TxA	Telemetry I/O to RS-422/485 [Tx -] Full Duplex TxA	Blue
7	HD3-7	TxB	Telemetry I/O to RS-422/485 [Tx +] Full Duplex TxB	Violet
8	HD3-8	Video	Video output of optical camera to Control Room (Coax - BNC CN1)	Core
9	HD3-9	Video 0V	Video signal return (optical camera) (ground to Control Room) (Coax - BNC CN1)	Screen
10	HD3-10	Tamp Sw	[Optional] Tamper Switch	Black
11	HD3-11	Wash	[Optional] Washer Drive Signal	Orange

No.	ID, Connection/ Terminal + Pin	PCB Mark, Signal	Description/Function of Connection	PCB Mark, Cable Color
12	HD6-1	AUX1	[Optional] Auxiliary Connection (heater)	Brown
13	HD6-2	AUX2	[Optional] Auxiliary Connection (heater)	Grey
14	HD7-1	--	Video Switched Output to Control Room (Switched visible/thermal video out signal)	Core (Black)
15	HD7-2	--	Switched video signal ground	Screen (Black)

Note: If connecting a heater, see *Commissioning the Camera with Heater Option Fitted, page 28*.

> **Notice!**
> MIC440 cameras do not have an internal heater.

> **Notice!**
> You must connect the overall shield drain wire of the composite cable to the power supply chassis in order to ground the chassis. Crimp the drain wire to the ring terminal lug attached to the mounting screw of the PCB located to the right of BNC socket CN3 (Video Switched). Refer to *Layout of MIC-240PSU-2 and MIC-115PSU-2, page 17* for the location of the screw.

19. Slide back the cable so that the shield is in the middle of the gland.
20. Tighten the cable gland so that it grips firmly the shielded composite cable. It is important that the braided cable screen engages with the internal clamps of the cable gland to ensure correct EMC protection.
21. If necessary, connect a tamper switch to terminal block HD2.
22. Make the necessary video connections. Feed the coaxial cable of your choice--see the table below to identify the recommended cable types, maximum distance, and other specifications for the coax video connection between the MIC power supply and the head-end control system--through the top-left M12 cable gland (item 1 in the figure "MIC PSU Enclosure, with cable glands identified").

Cable Type; Maximum Distance	RG-59/U; 300 m (1000 ft) RG-6/U; 450 m (1500 ft) RG-11/U; 600 m (2000 ft)
Size	O.D. between 4.6 mm (0.181 in.) and 7.9 mm (0.312 in.)
Shield	Copper braid: 95%
Central Conductor	Standard copper center

23. Crimp the end of the cable with a BNC terminal connector.
24. Connect the Video Out cable to BNC socket CN1.
For dual video output only: If needed, remove the blanking plug that covers the hole for the bottom-left M12 cable gland (item 3 in the figure "MIC PSU Enclosure, with cable glands identified"). Feed a second Video Out cable through the cable gland, and then connect the

switched Video Out cable to BNC socket CN3. This second cable provides control for video from both the optical camera and the thermal camera; users can switch between the two cameras.

25. Feed telemetry cable through the bottom-right M12 cable gland (item 4 in the figure "MIC PSU Enclosure, with cable glands identified").

26. Connect head-end RS-485 control to terminal block HD5, as indicated in the table below:

PCB Marking (non-IR PCBs)	Telemetry Signal Name	Connection Description / Function	Pin Number
RxB	Rx +	RS485+ to camera	1
RxA	Rx -	RS485- to camera	2
0V	Ground	0V from control room	3
TxA	Tx -	RS485- to control room	4
TxB	Tx +	RS485+ to control room	5

Note: The terminal block is positioned with the screw terminals on the left, next to the fuses. Pins are numbered from top to bottom in that orientation. Non-IR PSU PCBs are marked.

27. If connecting to additional add-on cards (for example, a card for 8-input alarms (MIC-ALM), and/or a Biphase card (MIC-BP4)), remove the second blanking plug that covers one of the holes for an M12 cable gland (item 3 in the figure "MIC PSU Enclosure, with cable glands identified"). Attach the supplied M12 gland. Make the appropriate connections to plug-in terminal CN2.

> **Notice!**
> For installation of the MIC 8-input Alarm Card (MIC-ALM) or Biphase converters (MIC-BP3 or MIC-BP4), please refer to their respective manuals.

▸ *For physical alarm connections on MIC IR power supplies*, connect alarm input cables to terminal block HD2, as indicated in the table below:

Signal	Pin Number
Alarm 1	1
0 V	2
Alarm 2	3
0 V	4
Alarm 3	5
0 V	6
Alarm 4	7
0 V	8

▸ *On MIC IR power supplies*, a washer drive is standard. A 24 VAC rated relay is fitted via the onboard fuse FS4 (rated at 2.5 Amps). Make the following washer pump connections to terminal block HD7 (marked Washer Drive on the PCB):

Signal	Pin Number
Washer Pump	1
Washer Pump	2

> ⚠ **Warning!**
>
> The washer pump terminal is rated only to 24 VAC or VDC maximum voltage and is not suitable for Mains-operated pumps.

▸ Test the washer by pressing the red button marked SW1 PUMP ON on the PCB.
LED 3 illuminates in response to telemetry commands from the control room to turn on the washer. Note that the software in the camera prevents the washer from running more than 10 seconds continuously to prevent emptying the washer bottle.

28. After wiring is complete, connect the power supply to the power source.

29. Verify that the following LEDs are lit:

LED	Description
LED 2	18 VAC power on to camera
LED 4	Power on for optional heater
LED 3	18 VAC power on camera
LED 5	Power on for optional heater
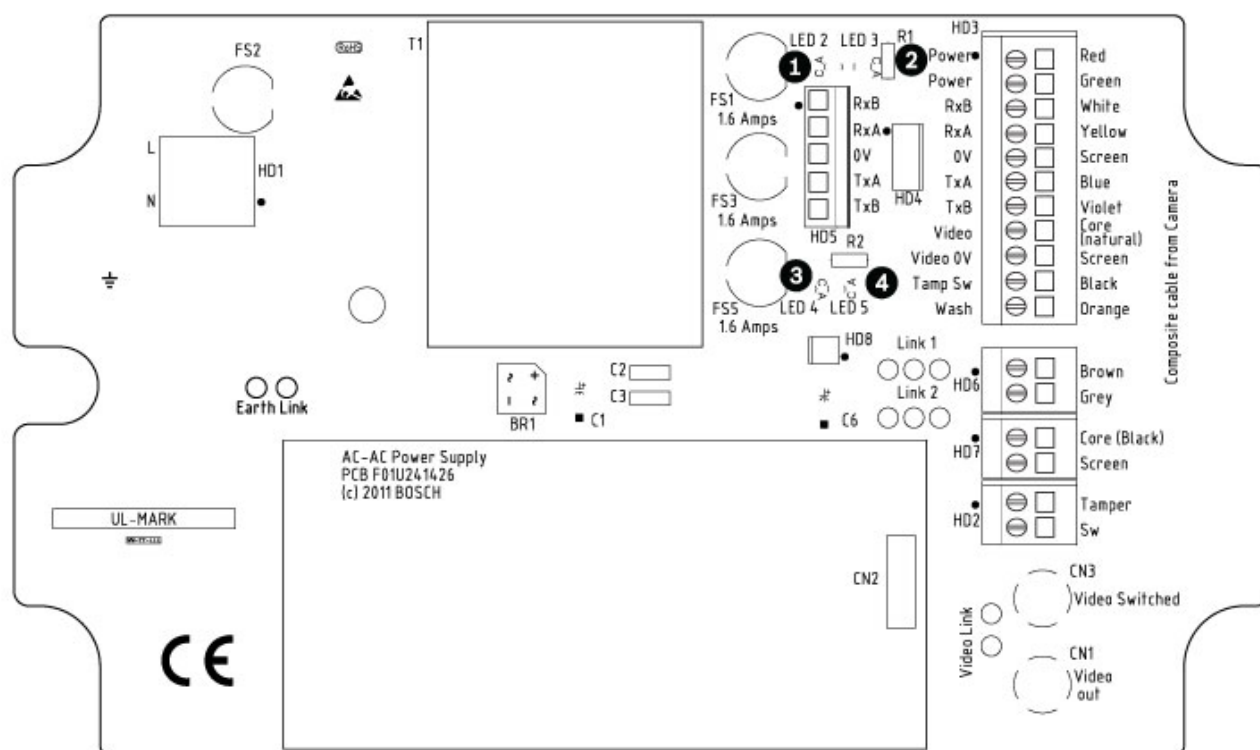
Figure 5.9: Position of LEDs - MIC Series power supply PCB
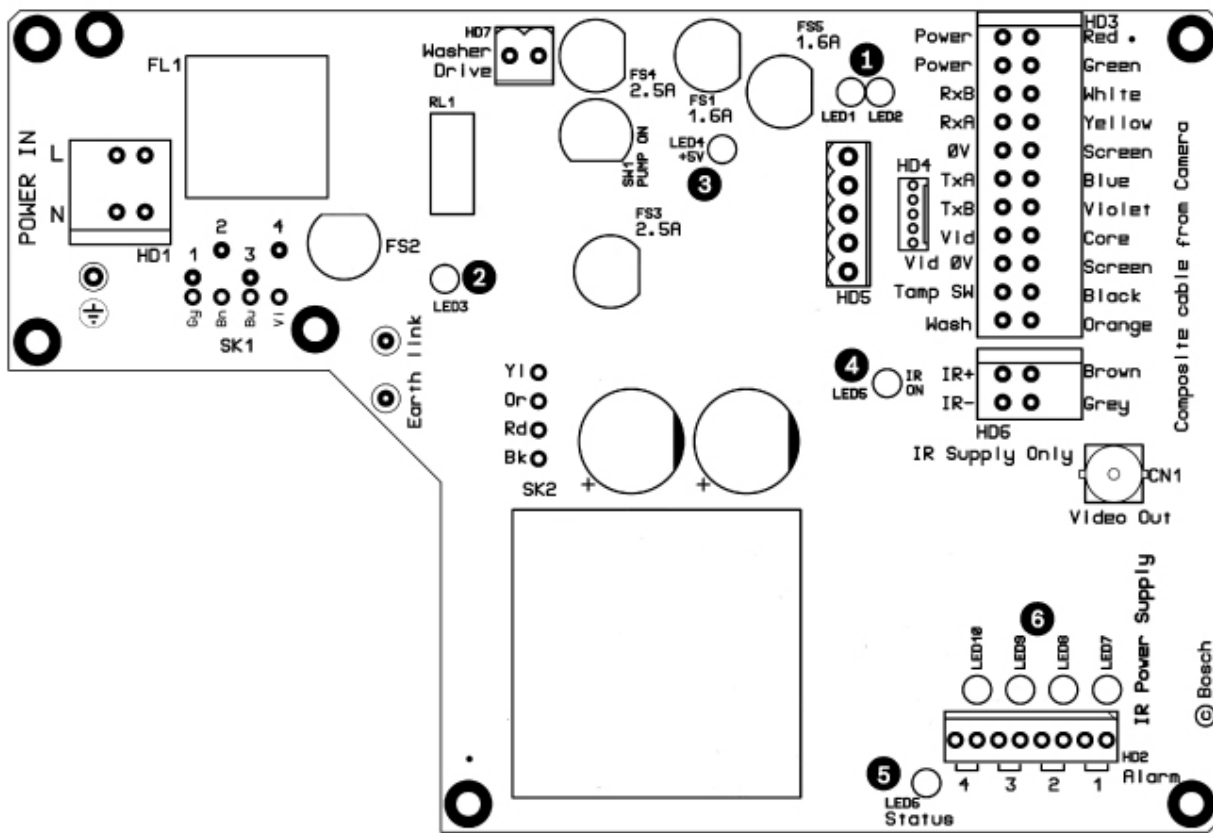
Figure 5.10: Position of LEDs - MIC Series IR power supply PCB

Number	LED	Description
1	LED 1 LED 2	Indicates that 18 VAC is available from the power supply and that the supply fuses are intact.
2	LED 3	Illuminates when the washer drive is on.
3	LED 4	Monitors the internally generate +5 V.
4	LED 5	Illuminates when the IR lamp supply is turned on by the camera telemetry.
5	LED 6	Status LED. Pulses On/Off when Multi Alarm is selected.
6	LED 7-10	Illuminate when the associated alarm is active.

30. Re-attach the enclosure lid and tighten the four (4) captive screws on the cover to ensure that the enclosure is watertight.

5.10   Commissioning the Camera with Heater Option Fitted

To enable the heaters, you must change two links on the printed circuit board (PCB) of the power supply. Follow these steps:
1.   Disconnect the power supply from the power source.
2.   Locate Link 1 and Link 2 on the PCB, next to terminal block HD6. The default setting is 0V.
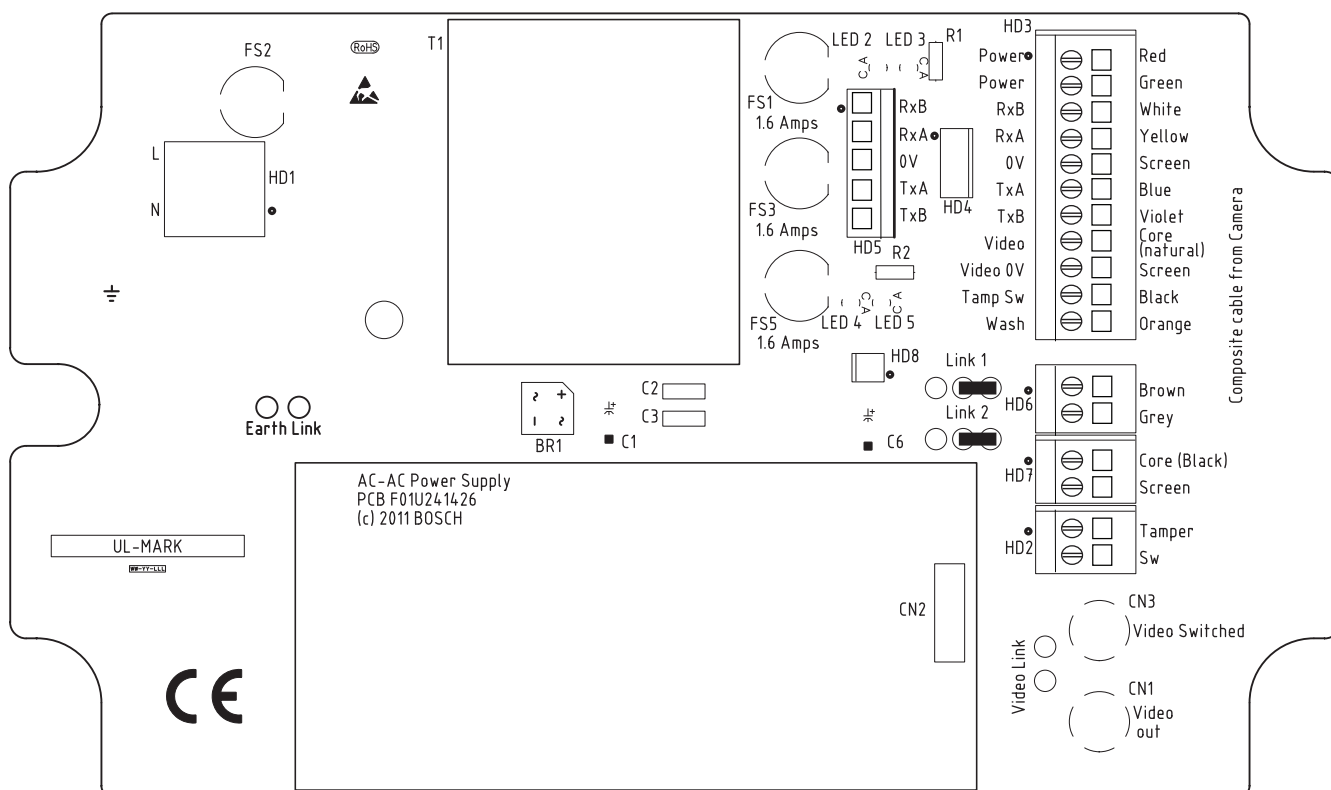
Figure 5.11: PCB links set to 0V

3.   Break the two solder links and remove any excess solder.
4.   Solder the links, using TCW link wire, from the left hand pads to the middle pads. The power supply will now deliver 18 VAC to terminal block HD6.
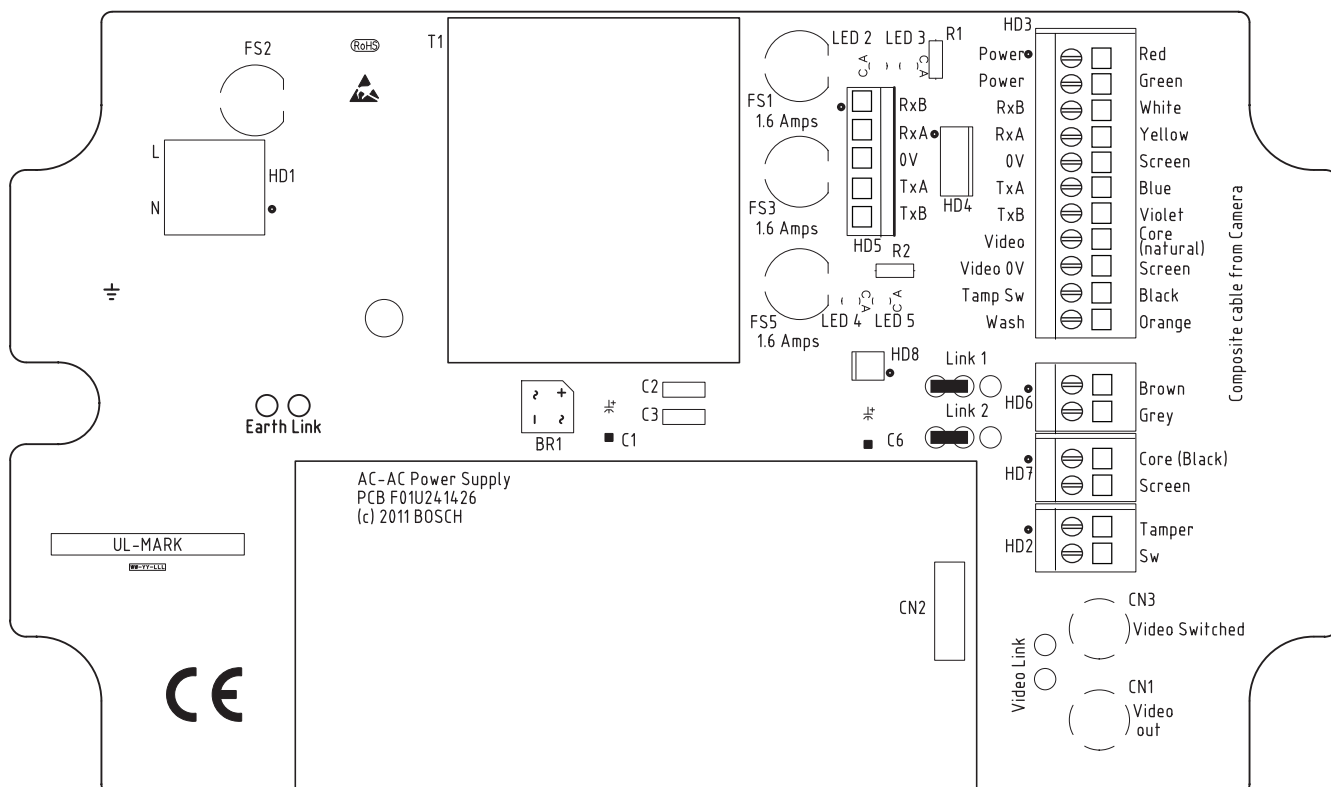
Figure 5.12: PCB links set to 18V

5. Locate the Brown and Grey wires from the composite cable.
6. Connect the heater wires Brown and Grey to terminal block HD6 as labelled on the PCB. The heaters are thermostatically controlled and will automatically turn on at +5 °C (+41 °F) and turn off at +15 °C (+59 °F).
7. Check all connections.
8. Close the PSU enclosure.
9. Reconnect the power supply to the power source.

5.11 Simultaneous IP and Analog Video/Control ("Hybrid" Operation)

The figure below illustrates how to configure your system to achieve simultaneous video and control over both IP and analog connections.
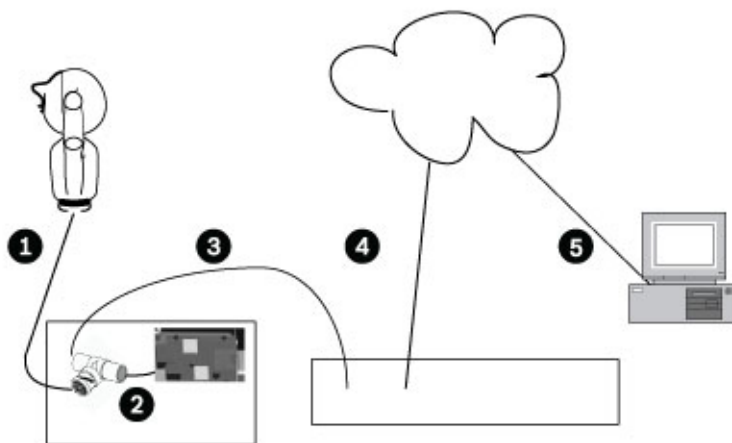
Figure 5.13: System configuration for simultaneous video/control

Number	Description
1	Connection between MIC camera and BNC T-connector in BNC socket on PCB in MIC IP PSU
2	Connection between BNC T-connector and encoder in MIC IP PSU
3	Connection between BNC T-connector and Bilinx-based control (head-end) system
4	Connection between Bilinx-based control (head-end) system and Local Area Network (LAN) (or the "cloud")
5	Connection between the Local Area Network (LAN) and PC connected to video monitor

6   Fit the Sunshield (MIC612)

The MIC612 Sunshield is designed to provide additional protection against direct solar radiation. It is a two-part molding and comes supplied with eight (8) stainless steel stand-offs and eight (8) stainless steel M3 washers and retaining screws.

The MIC612 stand-offs are slightly shorter than those for the MIC412 and have gnarled threads at one end. The MIC412 stand-offs are slightly longer and are smooth at one end.
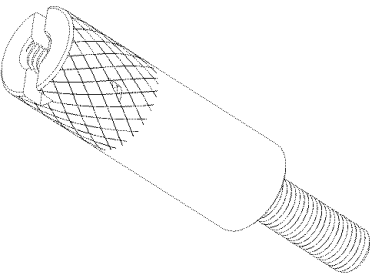
Stand-off for MIC612   Stand-off for MIC412
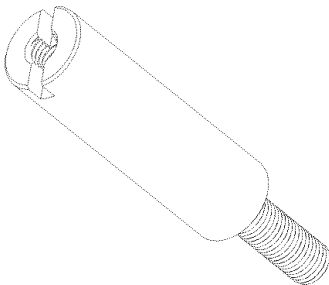
The MIC612 Sunshield is designed to provide additional protection against direct solar radiation. It is a two-part molding and comes supplied with eight (8) stainless steel stand-offs and eight (8) stainless steel M3 washers and retaining screws.

Caution!
DO NOT REMOVE the lid from the camera, and do not back drive the pan or tilt axis manually. Doing so will void the warranty. Back driving may also strip teeth off the internal gears.
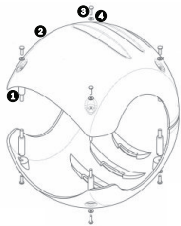
Figure 6.1: Graphical depiction of sunshield assembly

1	Stand-off, stainless steel
2	Sunshield
3	M3 x 10 mm screw, stainless steel, Pozidriv with pan head
4	M3 washer, stainless steel

To fit the sunshield, follow these steps:

1. Turn on the power to the camera so that you can rotate the camera head up to fit the bottom half of the sunshield (see step 8).
2. Rotate the camera under power—do not rotate by hand—until the bottom of the camera head is facing up.
3. Remove the four (4) retaining bolts from the lid of the camera.
4. Place a stand-off into each screw hole and tighten using a flat head screwdriver.
5. When all four (4) stand-offs have been fitted, align the holes in the sunshield with the corresponding stand-offs. Push the sunshield until it fits snugly onto the camera head.
6. Fix the sunshield to the stand-offs using the M3 washers and screws.
7. Rotate the camera under power—do not rotate by hand—until the top of the camera head is facing up.
8. Repeat steps two through six on the top lid of the camera. When fitted properly, both halves of the sunshield should align and meet at the back of the camera head.

7   Getting Started

Install and wire the camera according to the instructions in this manual and in the manuals that accompany the power supply and mounting devices. A typical system includes a keyboard, matrix switcher, monitor, and appropriate wiring connections. Refer to the individual product manuals for complete installation and setup instructions for each of the system components.

7.1   Establishing Control of the Camera

The MIC Series 612 supports two communication protocols (Biphase and RS-485), and both Bosch and Pelco D and P (keyboard) controller protocols that allow you to send commands to the camera and to receive information from the camera.

7.1.1   Establishing Control of the Camera via Biphase Protocol

> **Notice!**
> Biphase protocol works only with Bosch controller protocol. It does not work with Pelco controller protocol.

Biphase is the standard Bosch protocol used to send Pan/Tilt/Zoom control data. Biphase connections require a MIC-BP3 or a MIC-BP4 Biphase converter (sold separately).

Cable Type	Shielded Twisted Pair (STP)
System	Half-duplex, multidrop
Maximum Distance	1524 m (5000 ft) [Belden 8760 recommended]
Transmission Rate	31.25 KHz
Gauge	1.02 mm (18 AWG)
Termination Resistance	100 Ω
Terminal Connector	Screw terminals
Voltage	4 Vp-p

> **Caution!**
> The Biphase shield must be connected to the head end only.

7.1.2   Establishing Control of the Camera via RS-485 Protocol

Users can connect via
a) A computer -> RS-232 -> RS-232 to RS-485 converter -> MIC612
or
b) A computer -> USB to RS-485 -> MIC612.
RS-485 is capable of controlling a true multidrop network and is specified for up to 32 drivers and 32 receivers on a single 2-wire bus.

The MIC612 camera can be connected in a 2- or 4-wire mode. Available connection protocols are: Pelco, Bosch OSRD (via a keyboard with RS-485 output), Bicom over serial (via CTFID software; see the CTFID User Manual for installation details), and Forward Vision protocols.

Cable / Wire Type	Shielded Twisted Pair (STP)
System	Half-duplex, differential, multidrop

Maximum Distance	1219 m (4000 ft)
Maximum Baud Rate	57.6 kb
Gauge	0.511 mm (24 AWG)
Wire Impedance	120 Ω

> **Caution!**
> Bosch recommends that multiple RS-485 connections be arranged as a connected series of point-to-point (multidropped) nodes, as a line or as a bus. It is **not** recommended to arrange RS-485 connections as a star, ring, or as a multiple-connected network. Star and ring topologies may cause signal reflections or excessively low or high termination impedance.

In Pelco Protocol Mode, the camera is configured from the factory for RS-485 operation.
1. Connect the controller's Tx terminals to the Tx terminals in the power supply box. See the *MIC Series Power Supplies Installation Manual* for complete wiring instructions.
2. Pan or tilt the keyboard joystick to confirm that control has been established to the camera (approximately five (5) seconds).

7.2   Powering On

When you turn on power to the camera, a splash screen or text displays the type of device (MIC612), the camera model, the video type (PAL or NTSC), the firmware version, and (if applicable) the MAC address.

7.3   About Setting the Camera Address via FastAddress

The camera offers remote addressing via the feature "FastAddress," which allows you to set or to change a camera address using the keyboard and on-screen menus. The FastAddress feature allows you to install all cameras first, then to set the addresses via the control system. This feature makes it easier to re-address cameras at a later time because you do not need to go to the physical location of the camera to change the camera's address.

> **Notice!**
> FastAddress applies to the optical camera only; it does not apply to the thermal camera.

> **Notice!**
> You do not need to set a camera address if using Bilinx communication.
> **FastAddress** is stored in nonvolatile memory and does not change if the power is turned off or if the default settings are restored.

7.4   Setting the Addresses of the Two Cameras of the MIC612

After the MIC612 camera is on, you must set the camera address. The optical camera and the thermal camera of the MIC612 have different addresses. The address of the optical camera is set via the OSD and FastAddress. The address of the thermal camera is set via the OSD and a unique address. From the factory, the default address of the optical camera is "0" and the default address of the thermal camera is the address of the optical camera + 1.

The figure below illustrates the connection configuration of a MIC612, a matrix switcher, a monitor, and a keyboard.
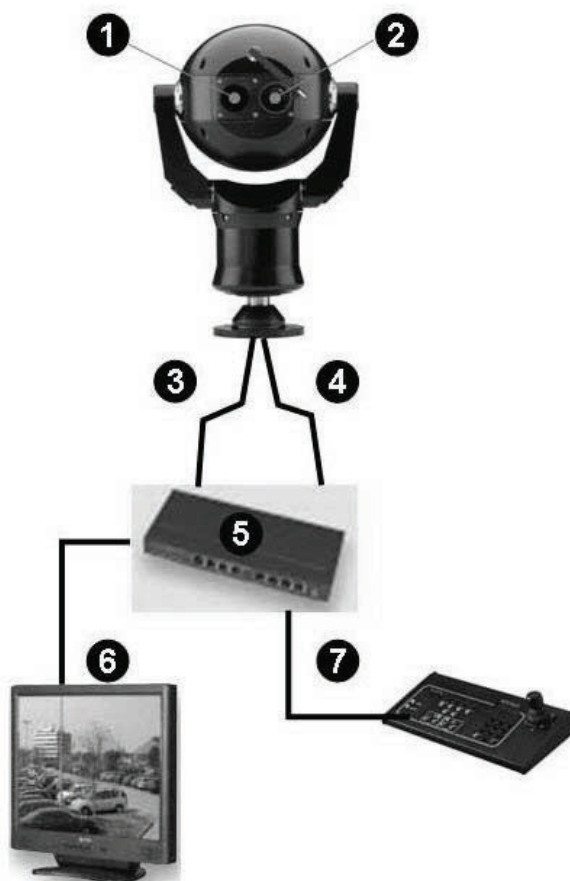
Figure 7.1: MIC612 Connection Configuration

1	Viewing window of optical camera	5	Matrix switcher
2	Viewing window of thermal camera	6	Monitor
3	Connection from optical camera to matrix switcher	7	Keyboard
4	Switchable connection (via Aux commands) from optical camera or thermal camera to matrix switcher		

7.5   FastAddress, Bosch Protocol

In Bosch protocol, there are three (3) **FastAddress** commands:
–   **ON-999-ENTER**: Displays and programs all cameras without an address in the system.

Notice!

If a keyboard is set to a camera number that already has an address, that camera also responds to this command.

– **ON-998-ENTER**: Displays and programs all cameras with or without an address in the system.
– **ON-997-ENTER**: Displays the current address status of all cameras in the system simultaneously.

To set an address for a camera without an address:
1. Select the camera number that you want to **FastAddress**. The system displays the camera number on the keyboard and the image on the corresponding monitor.
2. Press **#-ENTER** (where **#** is the camera number without an address).
3. Press **ON-999-ENTER** to invoke an on-screen display of cameras on the system without an address.
4. Follow the on-screen instructions. You receive an on-screen confirmation when the **FastAddress** is complete.

To change or clear an address for a camera with an address:
1. Select the camera number that you want to **FastAddress**. The system displays the camera number on the keyboard and the image on the corresponding monitor.
2. Press **#-ENTER** (where **#** is the camera number with an address).
3. Press **ON-998-ENTER** to invoke an on-screen display of all cameras on the system, with or without an address.
4. Follow the on screen instructions. You receive an on-screen confirmation when the **FastAddress** is complete.

The table below identifies the setting of the thermal camera when you change the address of the optical camera of the MIC612.

Default Address, Optical	New Address, Optical Camera	Address, Thermal Camera
0	A number other than 0	The number of the optical camera + 1
A number other than 0	0 or another number	*-No change of address.-*

You can change the address of the thermal camera via CTFID; there is no Aux code for this.

7.6   FastAddress, Pelco Protocols

This section provides instructions to set a FastAddress with a Pelco keyboard or controller.
– The optical camera of the MIC612 with an address set to 0 responds to commands set to any address.
– **Pelco-P** protocol must use addresses 1 to 32.
– **Pelco-D** protocol must use addresses 1 to 254.

Notice!

A previously-configured MIC with an address above 32 (Pelco-P upper limit) or 254 (Pelco-D upper limit) can be used without readdressing the unit. However, no two (2) addresses can be the same. For example:

Pelco-P addresses above 32 are repeated in multiples of 32 (1, 33, 65, 97 are the same).

Pelco-D addresses above 254 are repeated in multiples of 254 (1, 255, 509, 763 are the same).

To set FastAddress with a Pelco Keyboard:
1. Press and hold **95-PRESET** for two seconds to open the Pelco Setup menu.
2. Move the joystick to select the **Command Lock** menu.
3. Press the **FOCUS** or the **IRIS** button to turn Command Lock to **OFF**.
4. Move to the FastAddress menu and press the **FOCUS** button or the **IRIS** button to open the menu.
5. Use the joystick to enter the unique identifier for the camera.
   Move the joystick up or down to select the number.
   Move the joystick right to move to the next number position.
6. Move the joystick right to select Continue. Then, press the **FOCUS** or the **IRIS** button.
7. Use the keyboard to enter the FastAddress number. Then, press the **Camera** button.
   Note: To use a FastAddress number that is already assigned to a different camera, you must clear the number first.
8. Move the joystick down then up again to set the FastAddress number.
9. Press the **FOCUS** or the **IRIS** button to store the FastAddress number. The on-screen display menu confirms that the camera stored the FastAddress number.

7.7 Active Commands in FastAddress

The table below identifies the commands that will work and those that will not when users send commands via the FastAddress of the thermal camera:

Commands that will work	Commands that will not work
Pan, tilt	Menu commands
Thermal camera commands	Visible camera commands
Certain Aux commands (list to be populated)	Certain Aux commands

7.8 Setting Passwords

Passwords are used to control access to locked command menus. Unlocked commands are available to all users. Passwords are four (4) digits in length.

7.8.1 Special Passwords

The table below identifies special passwords and their function and security level.

Password	Function / Security Level
0000 (default)	Enables security and requires a user to enter the unlock command **OFF-90-ENTER** before invoking a locked command.
9999	Disables all security and allows all users to access locked commands.

7.8.2 Setting Passwords, Bosch Protocol

To set or change a password (locked command):
1. Press **OFF-90-ENTER** to turn off the command lock.
2. Press **SET-802-ENTER** to access the password menu.
3. Tilt the joystick up or down to choose a number. Tilt the joystick right to move to the next number position.
4. Follow the on-screen instructions and save the password. You receive an on-screen confirmation.

8   Controlling the Camera

The most common ways to control the MIC are:
– Using a keyboard and on-screen display (OSD) menus. This method is the most common. See *Basic Keyboard Operation, page 38*.
– Using the Configuration Tool for Imaging Devices (CTFID) software running on a PC with Bilinx or the RS-232/RS-485 communication protocol. Go to www.boschsecurity.com to download the latest version of the software and the *CTFID User Manual*.
– Using a PC-based graphical user interface (GUI).

8.1   Basic Keyboard Operation

The following tables summarize the basic operations for a standard keyboard and the functions available to control a MIC camera.

Typical Keyboard Features	Usage
Function Keys	Selects a specific control setting.
Number Keys	Inputs a number from 0 to 9.
Camera Key	Selects a camera number.
Enter Key	Inputs a selection.
Focus Key	Sets the lens focus or makes a menu selection in **OSD** mode.
Iris Key	Sets the lens iris setting or makes a menu selection in **OSD** mode.
Key LEDs	Indicates an active key.
LCD	Displays the current status.
Joystick	Controls the pan/tilt/zoom (PTZ) functions of the camera.

Table 8.1: Typical Keyboard Functions

Camera Operation	Control Method
To Pan Side to Side	Move the joystick left or right.
To Tilt Up and Down	Move the joystick forward and back.
To Zoom In	Twist the joystick clockwise.
To Zoom Out	Twist the joystick counterclockwise.

Table 8.2: Typical Keyboard Controls for a MIC Camera

8.2   Navigating the On-Screen Display (OSD) Menus

The OSD menus provide access to the programmable settings of the camera. The OSD displays only the submenus that are applicable to a particular MIC configuration. Some menu items (indicated as (L)) are locked and require a system password to use. Menu items marked with an asterisk (*****) are default factory settings, unless otherwise noted.

> **Notice!**
> After 4.5 minutes of inactivity, the OSD menu times out and exits without warning. Some unsaved settings in the current menu can be lost.

To navigate the OSD menus:
1. Use the joystick to highlight a menu item.
2. Press either the **Focus** or the **Iris** key to open a menu item.
3. Follow the on-screen instructions.

Note: To select the **Exit Menu** item from anywhere in the current menu, use the Zoom command.

8.3 Keyboard Commands, Bosch Protocol

Keyboard control commands are composed of a sequence of three (3) inputs with the following convention: 1) a **Function** key + 2) a **Command** number key(s) + 3) the **Enter** key.

– Depending on the type of keyboard, the control function keys are labeled:
   ON or **AUX ON**
   OFF or **AUX OFF**
   SET or **SET SHOT**
   SHOT or **SHOW SHOT**

> **Notice!**
> The convention used for control key commands in this manual is ON, OFF, SET, and SHOT. Refer to your keyboard manual for the key naming conventions.

– Command numbers range from 1 to 999. See *Keyboard Commands (Bosch Protocol) By Number, page 86* for a complete list of keyboard commands for Bosch protocol.
– The **Enter** key can also be labeled with the ∞ symbol.

For example, the keyboard command to make the camera pan 360º continuously is:
ON-1-ENTER (Press the **ON** key, then press the number **1** key, and then press **ENTER**.)
Refer to Keyboard Commands (Bosch Protocol) By Number for a complete list of commands.

8.4 Keyboard Commands, Pelco Protocol

Pelco control commands are composed of a sequence of two (2) keyboard inputs with the following convention: 1) a **Command Number** and 2) a **Function** key input.
The camera uses the **PRESET** command key to save and recall presets (pre-positions) 1 through 99.

> **Notice!**
> To save a preset, enter the desired number and hold the **PRESET** key for approximately two (2) seconds. To recall a preset, enter the desired preset number (or command) and momentarily press and release the **PRESET** key.

Keyboard Command	User Action	Description
0-Pattern	Press	Initiate recording continuous playback based upon current Recording setting (A or B) in the Setup Menu.
	Press and hold	Initiate recording based upon current Recording setting (A or B) in the Setup Menu. Press ACK to end recording.
1-Pattern	Press	Initiate Recording A continuous playback.
	Press and hold	Initiate Recording A. Press ACK to end recording.
2-Pattern	Press	Initiate Recording B continuous playback.
	Press and hold	Initiate Recording B. Press ACK to end recording.
3-Pattern	Press	Initiate the standard preset tour (Tour 1).
4-Pattern	Press	Initiate the custom preset tour (Tour 2).
1 - Aux On / Aux Off	Press	Activate / deactivate alarm output 1. This command is supported with Non-IR models only if an optional 8-input alarm card is installed in the PSU powering the camera.
2 - Aux On / Aux Off	Press	Activate / deactivate alarm output 2. This command is supported with Non-IR models only if an optional 8-input alarm card is installed in the PSU powering the camera.
5 - Aux On / Aux Off	Press	Toggle switchable video output of MIC612 camera between visible and thermal output.
91 - Aux On	Press	Activate Zone Scan (display zone titles).
92 - Aux On	Press	Deactivate Zone Scan (re-move zone titles).

8.5   Special Preset Commands, Pelco Protocol

Some **Pelco** mode preset commands have a special meaning and override the normal Pelco preset function as follows:

Preset Command	Description
33-PRESET	Pans the camera 180° (Flip).
34-PRESET	Goes to **Zero Pan** (original home position).
80-PRESET	Toggles the **Synchronization Mode** between Line Lock and Internal (Pelco Frame Scan). This command is available if commands are unlocked using the Main menu.
81-PRESET	Initiates **Preset Tour 1**.
82-PRESET	Initiates **Preset Tour 2**.
92-PRESET	Sets the **Left** pan limit for an AutoScan with **Limit Stops** enabled.
93-PRESET	Sets the **Right** pan limit for an AutoScan with **Limit Stops** enabled.

Preset Command	Description
94-PRESET	Initiates a **Preset Tour**.
95-PRESET	Enables or disables **Limit Stops** in the **Setup Menu** for AutoScan. Invokes the Pelco main **Setup Menu** when pressed for 2 seconds.
96-PRESET	Stops a scan.
97-PRESET	Initiates FastAddress (Pelco Random Scan).
98-PRESET	Toggles the **Synch. Mode** between **Line Lock** and **Internal** (Pelco Frame Scan). This command is available only for two (2) minutes after the power is applied and then reverts to normal preset functionality.
99-PRESET	Starts an AutoScan.

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Notice!

Some Pelco controllers do not support all of the preset command numbers. Refer to the documentation of the specific Pelco controller for supported preset commands.

9   On-Screen Display (OSD) Menus (Bosch Protocol)

This chapter identifies and describes each OSD menu option, as well as the default setting for each option, for Bosch protocol. For step-by-step instructions, see *Common User Commands, page 76* and *Advanced Features, page 78*.

To open the main Setup Menu (locked commands) in Bosch protocol:
1.   Press **OFF-90-ENTER** to turn off the command lock.
2.   Press **ON-46-ENTER** to access the **Setup Menu**. The screen **Setup Menu** appears.

Setup Menu		
Exit...		
Camera Setup		
Thermal Camera Setup		
Lens Setup		
PTZ Setup		
Display Setup		
Communication Setup		
Alarm Setup		
Language		
Advanced		
Diagnostics		
Focus / Iris: Select		

Setup Menu Choices:

Menu	Description
Exit	Exits the menu.
Camera Setup	Accesses adjustable camera settings such as: white balance, gain, sharpness, sync, line lock, backlight, shutter, and night mode.
Thermal Camera Setup	Accesses the settings for the thermal camera.
Lens Setup	Accesses adjustable lens settings such as: focus, iris, zoom speed, and digital zoom.
PTZ Setup	Accesses adjustable pan/tilt/zoom (PTZ) settings such as: Autopan, tours, PTZ speed, inactivity period, AutoPivot, and tilt limits.
Display Setup	Accesses adjustable display settings such as: OSD, sector blanking, and privacy masking.
Communication Setup	Accesses communication settings such as: AutoBaud and Bilinx.
Alarm Setup	Accesses the alarm settings such as: inputs, outputs, and rules.
Language	Displays the language.
Advanced	
Diagnostics	Displays the status of diagnostic events.

Notice!

Each Setup menu contains the following options: **Exit** (to exit the current menu) and **Restore Defaults** (to restore the default settings for the current menu only). The rest of this chapter identifies specifically only those menu options which are unique to a specific setup menu.

9.1   Camera Setup Menu

The **Camera Setup Menu** contains settings that can be changed/customized for the optical (visible) camera.

	Camera Setup		
	Exit...		
*	White Bal:	EXT ATW	
*	Gain Control:	AUTO	
*	Max Gain Level:	6 (4**)	
*	Sharpness:	12	
*	Backlight Comp:	OFF	
	WDR:	OFF	
*	Shutter Mode:	Auto SensUP	
*	Shutter:	1/60	
*	Auto SensUP Max:	15x	
*	Night Mode:	AUTO	
*	Night Mode Color:	OFF	
*	Night Mode Threshold:	55	
*	Pre-Comp:	1	
	Stabilization:	ON	
	Restore Defaults...		
	* = Factory Setting		
	Focus / Iris: Select		

White Bal

Maintains proper color reproduction (white balance) as the color temperature of a scene changes (for example, from daylight to fluorescent lighting).

Option	Description
Extended ATW	(Default setting) Adjusts camera color using extended range.
ATW	Adjusts camera color constantly.
Indoor W.B.	Optimizes camera color for typical indoor conditions.
Outdoor W.B.	Optimizes camera color for typical outdoor conditions.
AWB Hold	Sets the camera's color settings for the current scene.
Manual	Allows users to adjust the Red and Blue gain. Sliding scale: −(1 to 100)+
Outdoor Auto	Automatically adjusts camera color in outdoor scenes.
Sodium Lamp Auto	Automatically adjusts camera color in scenes with sodium vapor lighting.
Sodium Lamp	Allows users to adjust color in scenes with sodium vapor lighting.

Gain Control

Electronically brightens darker scenes which may cause graininess in low light scenes. Options: Auto (default setting), OFF.

Max Gain Level

Adjusts the maximum gain level to which the gain control adjusts when set to **AUTO**.
Sliding scale: −(1 to 6)+ (1=8db, 2=12db, 3=16db, 4=20db, 5=24db, 6=28db)
Default setting: 6 (for 28x camera); 4 (for 36X camera).

Sharpness

Adjusts the sharpness level of the picture.
Sliding scale: −(1 to 16)+. Default setting: 8

Backlight Comp

Improves image quality when the background illumination level is high. Options: ON, OFF (default setting).

WDR

Wide Dynamic Range. Options: ON, OFF (default setting), AUTO.

Shutter Mode

Turns Auto SensUP on or off. Options: Auto SensUP (default setting), OFF.

Shutter

Adjusts the electronic shutter speed (AES). Sliding scale: −(60 to 1/10000) +.
1/60 sec. (NTSC) or **1/50 sec.** (PAL)

Auto SensUP Max.

Sets the limit for sensitivity when the shutter speed is set to Auto SensUP. Options: 2x, 4x, 7.5x, 15x (default setting).

Night Mode
Selects night mode (B/W) to enhance lighting in low light scenes. Options: ON, OFF, AUTO (default setting).

Night Mode Color
Determines if color processing remains in effect while in night mode. Options: ON, OFF (default setting).

Night Mode Threshold
Adjusts the level of light at which the camera automatically switches out of night mode (B/W) operation. Sliding scale: −(10 to 55)+, (in increments of 5) 10 is earlier, 55 is later. Default setting: 55

Pre-Comp
Amplifies the video gain to compensate for long distance cable runs.
Sliding scale: −(1 to 10)+. Default setting: 1

Stabilization
Eliminates shaking of the camera in both the vertical and horizontal axes, resulting in exceptional image clarity without reducing camera sensitivity or picture quality. Options: ON, OFF (default setting).

9.2   Thermal Camera Setup Menu

The Thermal Camera Setup Menu contains settings that can be changed for the thermal camera.

	Thermal Camera Setup		
	Exit...		
*	Thermal Mode	White Hot	
*	SPOT meter display	OFF	
*	AGC Mode	OUTDOOR	
*	Second Channel Video		
	Restore Defaults...		
	* = Factory Setting		
	Focus/Iris: Select		

Thermal Mode

Adjusts the display mode for the thermal camera. Options:

Option	Description
White Hot	(Default setting) Hot objects appear brighter than cold objects.
Black Hot	Hot objects appear darker than cold objects.
Fusion	Cold objects appear deep blue or purple or black; hot objects appear yellow.
Rainbow	Cold objects appear black; hot objects appear red or yellow.
Globow	Similar to Fusion, without blue or purple.
Ironbow 1	Similar to Fusion, with more red in the middle of the range.
Ironbow 2	Similar to Fusion, with more orange in the middle of the range.
Sepia	Cold objects appear black; hot objects appear yellowish-green.
Color 1	Cold objects appear purple and black; hot objects appear red.
Color 2	Very similar to Ironbow 1.
Ice Fire	Cold objects appear blue; hot objects appear red.
Rain	Similar to Color 1, with more variations.
Red Hot	Cold objects appear black; hot objects appear bright red.
Green Hot	Cold objects appear black; hot objects appear bright green.

SPOT meter display

Controls the display of the spot meter, ON or OFF, and switches between degrees C and F. The Spot Meter must be ON before either the Thermal Digital readout or Thermometer can be displayed. Default setting: OFF

AGC Mode

Controls the Automatic Gain Control (AGC). Options:

Option	Description
Outdoor	(Default setting) Image contrast and brightness are optimized automatically as the outdoor scene varies.
Indoor	Image contrast and brightness are optimized automatically as the indoor scene varies.
Low Contrast	Creates better contrast between two objects of different temperatures.

Second Channel Video

Switches the video channel between Thermal camera option and Visible (optical) camera option.

9.3   Lens Setup Menu

The **Lens Setup Menu** contains lens settings that can be changed/customized.

	Lens Setup	
	Exit...	
*	Auto Focus:	SPOT
*	Auto Iris:	CONSTANT
*	Auto Iris Level:	8
*	Focus Speed:	2
*	Iris Speed:	5
*	Max Zoom Speed:	FAST
*	Digital Zoom:	ON
	Restore Defaults	
	* = Factory Setting	
	Focus / Iris: Select	

Auto Focus

Automatically focuses on the subject in the center of the screen. Options:

Option	Description
CONSTANT	Auto Focus is always active, even while the camera is moving.
MANUAL	Auto Focus is inactive; manual focus must be used.
SPOT	(Default setting) The camera activates Auto Focus after the camera stops movement. Once focused, Auto Focus is inactive until the camera moves again.

Auto Iris

Automatically adjusts to varying light conditions. Options:

Option	Description
MANUAL	Iris must be adjusted manually.
CONSTANT	(Default setting) Auto Iris is constantly active.

Auto Iris Level

Reduces the camera's iris level for proper exposure. Sliding scale: – (1 to 15) +. Default setting: 8.

Focus Speed

Adjusts the manual focus speed. Sliding scale: − (1 to 15) +. Default setting: 2.

Iris Speed

Adjusts the manual iris speed. Sliding scale: − (1 to 10) +. Default setting: 5.

Max. Zoom Speed

Adjusts the manual zoom speed. Options: SLOW, MEDIUM, FAST (default setting).

Digital Zoom

Enables or disables digital zoom. Options: ON (default setting), OFF.

9.4   PTZ Setup Menu

The **PTZ Setup Menu** contains pan/tilt/zoom settings that can be changed/customized.

	PTZ Setup		
	Exit...		
*	Autopan:	30 deg/sec	
*	Tour 1 Period:	5 sec	
*	Tour 2 Period:	5 sec	
*	PTZ Fixed Speed:	4	
*	Inactivity:	OFF	
*	Inact. Period:	2 min	
*	Autopivot:	ON	
*	Orientation	NORMAL	
*	Freeze Frame on Preposition	ON	
	Tilt Up Limit...		
	Azimuth Zero...		
	Restore Defaults...		
	* = Factory Setting		
	Focus/Iris: Select		

AutoPan
Adjusts speed of camera during AutoPan and AutoScan. Sliding scale: −(1º/sec. to 60º/sec.)+.
Default setting: 30º/sec.

Tour 1 Period
Changes dwell time between presets during the tour. Sliding scale: −(3 sec. to 10 min.)+.
Default setting: 5 sec.

Tour 2 Period
Changes dwell time between presets during the tour. Sliding scale: −(3 sec. to 10 min.)+.
Default setting: 5 sec.

PTZ Fixed Speed
Sets pan and tilt speed when controlled by a fixed speed controller. Sliding scale: −(1 to 15)+.
Default setting: 4.

Inactivity

Selects the mode to which the camera reverts after the period of inactivity set in the inactivity period. Options:

Option	Description
Scene 1	Returns to Preset 1.
Prev Aux	Returns to previous activity, such as Aux commands 1, 2, 7, 8, 50, or 52.
OFF	(Default setting) Remains on the current scene indefinitely.

Inact. Period

Sets the time period of inactivity before the above action occurs.

Sliding scale: − (3 sec. to 10 min.) +. Default setting: 2 min.

Autopivot

Automatically rotates the camera 180º when following a subject traveling directly beneath the camera. Options: ON (default setting), OFF.

Orientation

Selects mounting options. Options:

Option	Description
NORMAL	(Default setting) The camera is straight, upright; the software does not rotate the view.
INVERTED	The sofware rotates the video 180º automatically.

Freeze Frame On Preposition

Holds a preposition video frame while moving to another preposition. Options: ON (default setting), OFF.

Tilt Up Limit...

Sets the upper tilt limit of the camera. Use the joystick to move to a scene.

Azimuth Zero...

Sets the zero degree pan position. Use the joystick to move to a scene that you want to set as the zero degree pan position and as the North compass heading. For more details, refer to *Azimuth, Elevation, and Compass Directions, page 80*.

9.5   Display Setup Menu

The **Display Setup Menu** contains display settings that can be changed/customized.

	Display Setup		
	Exit...		
*	Title OSD:	MOMENTARY	
*	Camera OSD:	ON	
	Display Adjust		
*	Azimuth:	OFF	
*	Compass:	OFF	
	Sector Blanking...		
	Privacy Masking...		
	Edit Sector Title...		
	Edit Scene Title...		
	Restore Defaults...		
	* = Factory Setting		
	Focus / Iris: Select		

Title OSD

Controls how the OSD displays sector or shot titles. Options:

Option	Description
OFF	Titles are hidden.
ON	Titles are displayed continuously.
MOMENTARY	(Default setting) Titles are displayed for a few seconds, then disappear from the screen.

Camera OSD

Controls how the OSD displays camera response information, such as Digital Zoom, Iris open/close, and Focus near/far. Options: ON (default setting), OFF.

Display Adjust

Adjusts the text brightness and vertical position of the on-screen title. Options:

Option	Description
Up	Moves screen title up.
Down	Moves screen title down.
Brighter	Brightens the intensity of the on-screen text.
Darker	Darkens the intensity of the on-screen text.

Azimuth

Display azimuth/elevation values. Options: ON, OFF (default setting). For more details, refer to *Azimuth, Elevation, and Compass Directions, page 80*.

Compass

Displays compass heading. Options: ON, OFF (default setting). For more details, refer to *Azimuth, Elevation, and Compass Directions, page 80*.

Sector Blanking

Allows video blanking of selected sectors. Press **Focus/Iris** to blank or clear a sector (1 through 16). Follow the on-screen instructions.

Privacy Masking

Allows masking of sensitive areas. Select option **Mask** and follow the on-screen instructions to set a mask for up to 24 privacy masks are available, with a maximum limit of eight (8) to a scene. For more details, refer to *Privacy Masking, page 79*.

Edit Sector Title

Allows editing of existing Sector (Zone) Titles. Select a sector title to access the character palette. For instructions, refer to Specifying a Shot or a Sector Title.

Edit Scene Title

Allows editing existing Scene (Shot) Titles. Select a scene title, and then select a menu option:
– **Edit Scene Title** to access the character palette. For instructions, refer to Specifying a Shot or a Sector Title.
– **Clear Scene** to delete the selected scene title.

9.6   Communication Setup Menu

The **Communication Setup Menu** contains baud rate and Bilinx control settings.

	Communication Setup		
	Exit...		
*	AutoBaud:	ON	
*	Baud Rate:	9600	
	Bilinx		
	Restore Defaults		
	* = Factory Setting		
	Focus / Iris: Select		

AutoBaud

Turns on AutoBaud detection, which detects and adjusts the camera protocol and baud rate to match that of the controller. Options: ON (default setting), OFF. ON automatically accepts baud rates from 2400 to 57600.
Note: If stepping from 2400 to 57600 baud, you must first set the Baud Rate to 19200 for AutoBaud to detect the higher baud rate.

Baud Rate

Manually sets the baud rate when AutoBaud is set to OFF. Options are 2400, 4800, 9600 (default setting), 19200, 38400, and 57600.

Bilinx

Activates Bilinx control communication. (Only available when not connected to a Bilinx data interface unit.) Options: ON (default setting), OFF.

9.7   Alarm Setup

The **Alarm Setup Menu** contains alarm inputs, outputs and rules.

> **Notice!**
>
> The maximum number of Alarm Inputs is eight (8), available only on the Alarm and Washer
> Pump Drive Card (MIC-ALM) (sold separately). This card is available for non-IR power supply
> units (PSUs) only. IR models only will show Alarm Inputs 1–4 and numbers 5–12 will display
> NONE. See *Layout of MIC-240PSU-2 and MIC-115PSU-2, page 17* for the specific number of
> alarm Inputs and Outputs per PSU.

Alarm Setup			Inputs Setup			
Exit...			Exit...			
Multi Alarm Setup			1. Alarm Input 1	N.O.		
Inputs Setup...			2. Alarm Input 2	N.O.		
Outputs Setup...			3. Alarm Input 3	N.O.		
Rule Setup...			4. Alarm Input 4	N.O.		
Restore Defaults...			5. Alarm Input 5	N.O.		
			6. Alarm Input 6	N.O.		
			7. Alarm Input 7	N.O.		
			8. Alarm Input 8	N.O.		
			9. NONE			
			10. NONE			
			12. NONE			
			12. NONE			
			Focus / Iris: Select Type			
Focus / Iris: Select			Right / Left: Select Mode			

Multi Alarm Setup

Allows setup of multiple alarms. Options: On; Off. Checkbox button to "Select."

Inputs Setup Submenu Choices:

Inputs Setup

Defines physical inputs or events and commands that can be used in a rule. There are twelve (12) alarm inputs available.

Inputs 1-8

Defines the type of physical input (dry contact): N.O. (Normally Open) (default setting) or N.C. (Normally closed).
Inputs 1–4 are available for Standard and IR models.
Inputs 5–8 are available for Standard models with optional alarm card installed.

Inputs 9-12

Defines input commands that can be used in a rule. Command inputs can also be customized by using non-assigned keyboard command numbers.

Option	Description
NONE	(Default setting) No command defined.
Aux On	Responds to a standard or custom keyboard **ON** (1-99) command.
Aux Off	Responds to a standard or custom keyboard **OFF** (1-99) command.
Shot	Responds to a Preset shot or scene from 1-99.

On models with the 35 mm thermal lens, you can also select either High Temp Thermal Meter or Low Temp Thermal Meter, to trigger an alarm on the OSD if the thermal spot meter identifies that the temperature of an object in the view of the camera is outside of the temperature threshold set in the system. By default, the option is "Not Set." For more details, see *Section 8.4 Triggering Alarms On Detection of Objects Outside of Set Thermal Temperature Threshold, page 58*.

Outputs Setup Submenu

Outputs Setup...			
Exit...			
1. NONE			
2. NONE			
3. NONE			
4. NONE			
5. NONE			
6. NONE			
7. NONE			
8. NONE			
9. NONE			
10. NONE			
11. NONE			
12. NONE			
Focus / Iris: Select Type			
Right / Left: Select Mode			

Outputs Setup Submenu Choices:

Outputs Setup
Defines physical outputs and keyboard commands for use in a rule.

Outputs 1–2
Defines a physical output: N.O. (Normally Open circuit) (default setting) or N.C. (Normally closed circuit).

Outputs 3–12
Defines a command output for use in a rule.

Option	Description
None	(Default setting) No command defined.
Aux On	Responds to a keyboard **ON** command.
Aux Off	Responds to a keyboard **OFF** command.
Shot	Responds to a Preset shot.
OSD	Displays the output on the on-screen display.
Transmit	Transmits a message back to the head end (available with RS-232 serial and Bilinx connections).
NONE	(Default setting) No command defined.

Rule Setup Submenu

> **Notice!**
> You can program a total of twelve rules. You must define the inputs and outputs before you program a rule. See *Alarm Setup, page 55*, to configure alarm inputs and outputs.

Rule Setup...			Rule 1		
Exit...			Exit...		
1. Rule 1	Enabled		Enabled	YES	
2. Rule 2	Disabled		Input:		
3. Rule 3	Invalid		NONE		
4. Rule 4	Empty		NONE		
5. Rule 5	Empty		NONE		
6. Rule 6	Empty				
7. Rule 7	Empty		Output:		
8. Rule 8	Empty		OSD		
9. Rule 9	Empty		Shot 2		
10. Rule 10	Empty		Alarm Relay	2 sec	
11. Rule 11	Empty		NONE		
12. Rule 12	Empty				
			Right / Left: Select Period Time		
Focus / Iris: Select			Focus / Iris: Select Type		

Rule Setup Submenu Choices:

Rule Setup
Displays the status of rules and lets you add new rules or modify an existing rule.
Rule 1-12
Displays the status of a rule on the right side of the menu. Rule status options:

Option	Description
Enabled	The rule inputs and outputs are properly defined and the rule is turned on.
Disabled	The rule inputs and outputs are defined but the rule is turned off.
Invalid	The rule has a missing or invalid input or output.
Empty	(Default setting) The rule has no inputs or outputs defined.

Selecting a **Rule** number provides access to its configuration menu. The **Rule # Menu** allows you to configure a rule from previously-defined alarm inputs and outputs. Once an alarm is configured with valid inputs and outputs, it can be turned on or off (enabled or disabled) through its configuration menu.

Rule # Choices:
Enabled
Turns the rule on or off after its inputs and outputs have been defined. **YES** to enable or **NO** to disable (default setting).
Input
Toggles through a list of valid inputs set in the **Alarm I/O Setup > Inputs Setup Menu** that defines the rule's inputs. A rule can have up to four (4) inputs.
Inputs which were set in the **Inputs Setup Menu** include **Aux On/Off (1–99), Shot,** and NONE (default setting).
Output
Toggles through a list of valid outputs set in the **Alarm I/O Setup > Outputs Setup Menu** that defines a rule's outputs.
Outputs set in the **Outputs Setup Menu** include **Alarm Relay, Aux On/Off (1–9), Shot, OSD, Transmit**, and **NONE** (default setting).
Some outputs, such as **Alarm Outputs 1–2** and **Aux On/Off** can be set to be active for a specific duration of time as follows:
Seconds: 1–5, 10, 15, or 30
Minutes: 1–5 or 10
Latched: The alarm stays active until acknowledged.
Follows: The alarm follows the alarm rule.
Default setting: **NONE**

> **i** **Notice!**
> You can include up to four (4) **Input** and **Output** events in a single rule. Each input and output, however, must be true for the alarm's rule to be valid and enabled.

9.8 Language Menu

The **Language Menu** contains a list of languages in which the on-screen menus are available.

Language		
Exit...		
English		
Spanish		
French		
German		
Portuguese		
Polish		
Italian		
Dutch		
Russian		
Czech		
Focus / Iris: Save and Exit		

9.9   Diagnostics Menu

The **Diagnostics** menu contains a list of diagnostic tools and events. Most of these menu items are display items only; you cannot select different values to change.

Diagnostics		
Exit...		
Alarm Status...		
BIST...		
Internal Temp:	Deg F / Deg C	
High Temp Events:	Deg F / Deg C	
Highest Temp	Deg F / Deg C	
Low Temp Events:	Deg F / Deg C	
Lowest Temp:	Deg F / Deg C	
Internal Humidity	%	
Humidity Events	0	
Security Access:	0	
CTFID Access:	0	
Restart Events:		
Power-up Events:	0	
Low-Volt Events:	0	
Video Loss Events:	0	
Total Time On	0hr 0min	
Thermal Camera Test Pattern	On/Off	
Focus / Iris: Save and Exit		

Alarm Status

Enters the Alarm Status menu and displays the real time status of alarm inputs and outputs. Alarm Inputs 1 to 8, Alarm Outputs 1 to 2 (Closed or Open)

BIST

Enters the Perform **Built-in Self Tests** menu. **YES** to start test. If confirmed, the BIST tests start and the results are displayed. Typical results are:

Data Flash: PASS
FPGA: PASS
Bilinx: PASS

Internal Temp.

Displays the current temperature of the camera, in degress Fahrenheit and in degrees Celsius.

High Temp Events

Displays the number of times that the threshold of high temperature was exceeded.

Highest Temp

Displays the highest temperature reached, in degrees Fahrenheit and in degress Celsius.

Low Temp Events

Displays the number of times that the threshold of low temperature was exceeded.

Lowest Temp

Displays the lowest temperature reached, in degrees Fahrenheit and in degress Celsius.

Internal Humidity

Displays the percentage of humidity inside the camera housing.

Humidity Events

Displays the number of times that the threshold of the humidity inside the camera housing was exceeded.

Security Access

Displays the number of times that the locked-command menu is unlocked.

CTFID Access

Displays the number of times that the Configuration Tool is accessed.

Restart Events

Displays the number of restart events.

Power Up Events

Displays the number of power up events.

Low Volt Events

Displays the number of times that the camera dropped below the acceptable voltage limit.

Video Loss Events

Displays the number of time that video was lost.

Thermal Camera Test Pattern

Activates the test pattern mode to verify electronics (the output of the digital data channel) for the thermal camera.

Option	Description
Off	(Default setting) No test pattern is available.
Ascending ramp	A test pattern appears in the analog and digital data channels, to allow you verify the output of the digital data channel. The figure below is a horizontal slice of the complete image; the pattern repeats 19 times in the complete image. When displayed on an analog video monitor, and if the AGC mode is not set to the default value, the pattern may appear differently than shown here. Slice of complete image (320 x 256 or 640 × 512) – 1: (0,0) = 0 – 2: (639,0) = 639 – 3: (25,408) (320 models)/(383,25) (640 models) = 16383 – 4: (25,409) (320 models)/(384,25) (604 models) = 0
Vertical	.
Color bars	

> **Notice!**
>
> Before activating the test pattern, turn off the correction terms and set the AGC Mode to Outdoor. This mode will not persist over a power cycle.

Total Time On

Displays the total time that the video has been on.

Alarm Status Submenu

This menu displays the status of the alarm inputs and outputs.

The Alarm Status submenu appears differently depending upon the Multi-Alarm setting.

Alarm Status	
Exit...	
Alarm Input 1	Open
Alarm Input 2	Open
Alarm Input 3	Open
Alarm Input 4	Open
Alarm Input 5	Open

Alarm Status	
Alarm Input 6	Open
Alarm Input 7	Open
Alarm Input 8	Open
Alarm Output 1	Open
Focus / Iris: Save and Exit	

Alarm Input 1...8
Displays the status of alarm inputs 1 through 7.
High
Low
Open (Normally Open)
Closed (Normally Closed)

Alarm Output
Displays the status of the alarm output.

10   On-Screen Display (OSD) Menus (Pelco Protocol)

This chapter identifies and describes each OSD menu option, as well as the default setting for each option, for Pelco protocol. For step-by-step instructions, see *Common User Commands, page 76* and *Advanced Features, page 78*.

To open the main Setup Menu in Pelco protocol: Press **95**-**PRESET** for approximately 2 seconds. The screen **Setup Menu** appears.

Setup Menu		
Exit...		
Command Lock:	OFF	
Bosch Menu		
Camera Setup		
PTZ Setup		
Edit Password		
*FastAddress:	Not Set	
Advanced		
Software Version		
Ack and Reset Alarms		
Restore All Settings		
Reset All Memory		
* = Factory Setting		
Focus / Iris: Select		

Setup Menu Choices:

Menu	Description
Exit	Exits the menu.
Command Lock	Allows or prohibits accessing locked commands. (If password is set, you are prompted to enter the password. The default setting is **ON**.
Bosch Menu	Accesses the full configuration menu and all camera settings.
Camera Setup	Accesses adjustable camera settings such as White Balance and Night Mode.
PTZ Setup	Accesses adjustable pan/tilt/zoom (PTZ) settings such as tours, scan speed, edit presets, limit stops, recording, and AutoPivot settings.
Edit Password	Changes the password.
FastAddress	Sets or changes a camera address.
Advanced	
Software Version	Displays the current software versions.
Ack and Reset Alarms	Acknowledges and resets active alarms.
Restore All Settings	Restores all settings to their original default setting.
Reset All Memory	Clears all settings, including scene shots, tours, and recordings stored in the camera memory.

> **i** **Notice!**
> If commands are locked and you press **Focus** or **Iris**, the camera displays the on-screen message: "Command is Locked."

10.1   Bosch Menu

The **Bosch Menu** allows full access to the main **Setup Menu** and all camera configuration settings.

Pelco menu				Bosch menu		
Setup Menu				**Setup Menu**		
Exit...						
Command Lock:	OFF			Exit...		
Bosch Menu				Camera Setup		
Camera Setup				Lens Setup		
PTZ Setup				PTZ Setup		
Edit Password				Display Setup		
*FastAddress:	Not Set			Communication Setup		
Advanced				Alarm Setup		
Software Version				Language		
Ack and Reset Alarms				Advanced		
Restore All Settings				Diagnostics		
Reset All Memory						
* = Factory Setting						
Focus / Iris: Select				Focus / Iris: Select		

Refer to *On-Screen Display (OSD) Menus (Bosch Protocol), page 42* for a complete description of Bosch menus and configuration settings.

10.2   Camera Setup

The Pelco **Camera Setup Menu** provides access to camera settings.

	Camera Setup	
	Exit...	
*	White Bal:	OUTDOOR
*	Night Mode:	AUTO
*	Wiper	CONTINUOUS
	* = Factory Setting	
	Focus / Iris: Select	

Camera Setup Menu Choices:

Menu	Description	Sub-menu / Description	Default Setting
Exit	Exits the menu.�		
White Balance	Sets a default value in case the Pelco controller disables the white balance.	**OUTDOOR**: Sets a default setting if the controller disables white balance. **INDOOR**: Sets a default setting if the controller disables white balance.	**OUTDOOR**
Night Mode	Switches from color to monochrome.	**ON**: Sets Night Mode on. **OFF**: Sets Night Mode off. **AUTO**: Sets Night Mode to Auto set.	**ON** (Day/Night models only)
Wiper		**ON/OFF**: Activates/deactivates the selected wiper mode, respectively. **CONTINUOUS**: Wiper wipes continuously until deactivated manually or by the five-minute time-out built in to the system. **INTERMITTENT**: Wipes twice, then turns off after 15 seconds. **ONE SHOT**: Wipes five times, then turns off. **WASH WIPE**: Wiper washes and wipes.	Continuous

10.3   PTZ Setup

The Pelco **PTZ Setup Menu** provides access to the PTZ settings such as tours, scan speed, presets, limit stops, recording, and AutoPivot.

	PTZ Setup		
	Exit...		
*	Edit Tour 1...		
*	Edit Tour 2...		
*	Tour 1 Period:	5 sec	
*	Tour 2 Period:	5 sec	
*	Scan Speed	30 deg/sec	
	Edit Presets...		
*	Limit Stops:	OFF	
*	Recording:	"A"	
*	Autopivot:	ON	
	* = Factory Setting		
	Focus / Iris: Select		

PTZ Setup Menu Choices:

Menu	Description	Sub-menu / Description	Default Setting
Exit	Exits the menu.		
Edit Tour 1	Accesses the **Add / Remove Scenes On Standard Tour 1 Menu**.	**Exit**: Exits the menu. **Scene (1 - 5)**: Adds or removes scenes from the **Standard Tour**.	
Edit Tour 2	Accesses the **Edit Custom Tour Menu**.	**Exit**: Exits the menu. **Scene (1 - 5)**: Adds or removes scenes from the **Custom Tour**.	
Tour 1 Period	Changes the length of waiting time between presets.	Sliding scale: – (3 sec. to 10 min.) +	**5 sec.**
Tour 2 Period	Changes the length of waiting time between presets.	Sliding scale: – (3 sec. to 10 min.) +	**5 sec.**
Scan Speed	Changes the Autopan and AutoScan speeds.	Sliding scale: – (1°/sec to 60°/sec) +	**30°/sec.**
Edit Presets	Modifies preset scenes.	1-99 scenes	
Limit Stops	Toggles the Limit Stops for AutoScan.	**ON** or **OFF**	**OFF**
Recordings	Selects record Pattern 1 or 2, if normal pattern command does not respond.	**"A"** or **"B"**	**"A"**
AutoPivot	Follows a subject while beneath the camera, without inverting the picture.	**ON or OFF**	**ON**

10.4   AUX Setup Menu

The **AUX Setup menu** provides an area to remain Aux commands.

	AUX Setup
	Exit...
*	WASH WIPE
*	Alarm Output 2:
*	Not Set
	Not Set
	Not Set
	Not Set
	* = Factory Setting
	Focus / Iris: Select

10.5   Other Menus

Menu	Description	Default Setting
Edit Password	Sets or displays the password. See *Setting Passwords, page 37*.	
FastAddress	Sets or changes the address.	**Not Set**
Software Version	Displays the camera software version.	
Ack and Reset Alarms	Acknowledges and resets alarms. If there is no active alarm input, the OSD displays the following message: "No Active Alarms."	
Restore All Settings	Restores all settings to their original factory default settings.	
Reset All Memory	Restores all settings to their original factory default settings and clears all user programmed settings such as preset scenes and recordings.	

11   Operation of the Thermal Camera

11.1   Switching Video

To switch Video Channel 2 between the optical (visible) camera and the thermal camera, enter the Thermal Camera Setup menu of the OSD, select the option Second Channel Video, and then toggle to the appropriate choice.

11.2   Flat-Field Correction (FFC)

The thermal camera uses an internal process called flat-field correction (FFC) to improve the quality of the thermal video image displayed on the monitor. During this process, a shutter rotates in front of the Focal Plane Array (FPA) to give a uniform temperature (a flat field) to every detector element. During the process (which takes less than a second), the live thermal video image is frozen, and persists, while the camera updates correction coefficients. After the process completes, live video returns automatically. With a more uniform array output, the quality of the image should improve.

About 2 seconds before an automatic FFC operation, the thermal camera displays a small green square in the upper right of the video output. This square symbol is called the Flat Field Imminent Symbol; it warns that FFC is about to begin.

Figure 11.1: Thermal image with Flat Field Imminent Symbol (green square)

Performing FFC often should prevent the thermal video image from appearing "grainy". This is especially important when the temperature of the camera is fluctuating, such as immediately after the camera is powered on, or when ambient temperature is changing.

11.3   Displaying Thermal Camera Temperature

The thermal camera can display its internal temperature on the video output with a SPOT meter (320 TVL models only).
1.   In Bosch protocol, in the OSD, enter "Aux ON + 463 + ENTER." The message, "SPOT meter Display: ON" should appear on-screen, and the SPOT meter should appear.
     Note: entering "Aux OFF + 463 +ENTER" deactivates the SPOT meter.
2.   Select the appropriate temperature scale. Enter "Aux ON + 463 + ENTER" again to toggle the temperature scale as necessary. (The default scale is in Degrees F.)

	Notice!
i	The selected settings should remain in internal memory; if you must turn off power to the camera, the camera should retain the last meter display and the temperature scale (°F/°C); those should appear after power on.

11.4   Triggering Alarms On Detection of Objects Outside of Set Thermal Temperature Threshold

On models with the 35 mm thermal lens, you can set a High Temp Thermal Meter or Low Temp Thermal Meter in order to trigger an alarm if the thermal spot meter identifies that the temperature of an object in the view of the camera is outside of the temperature threshold set in the system. The alarm input "High Temp Thermal Meter" identifies the high temperature threshold for objects in view of the camera. If the camera detects an object with a temperature that is higher than the threshold that is set in the system, it triggers an alarm. The alarm input "Low Temp Thermal Meter" identifies the low temperature threshold for objects in view of the camera. If the camera detects an object with a temperature that is lower than the threshold that is set in the system, it triggers an alarm. For both inputs, the temperature range is -40 °C to +150 °C, in 1 degree increments. The temperature scale is in degrees Celsius only. The system allows you to set multiple high and low temperature inputs. You can also set only a High threshold, or only a Low threshold; you do not need to set both. To trigger the alarm, you must set the temperature threshold (high or low or both), and then set the alarm rule.

Set the High Temperature Threshold

To set the High Temp Thermal Meter input, follow these steps:
1.   Access the Alarm Setup menu of the OSD.
2.   Select the Inputs Setup submenu.
3.   Select the number of the input that you want to set.
4.   Select the value "High Temp Thermal Meter".
5.   Select the degree for the high temperature threshold (for example, 50 °C). The default option is "Not Set."
6.   Exit the Inputs Setup submenu. The High Temperature threshold is now set.

Set the Low Temperature Threshold

To set the Low Temp Thermal Meter input, follow these steps:
1.   Access the Alarm Setup menu of the OSD.
2.   Select the Inputs Setup submenu.
3.   Select the number of the input that you want to set.
4.   Select the value "Low Temp Thermal Meter".
5.   Select the degree for the low temperature threshold (for example, -10 °C). The default option is "Not Set."
6.   Exit the Inputs Setup submenu. The Low Temperature threshold is now set.

Set the Alarm Rule

To set the rule for the thermal temperature alarm, follow these steps:
1.   Access the Rule Setup submenu.
2.   Select the number of the rule that you want to define.
3.   Select "Input."
4.   Select the appropriate Input value: "High Temp Thermal Meter" or "Low Temp Thermal Meter".
5.   Select "Output."
6.   Select the appropriate Output value. For example, in order to display the thermal temperature alarm, when triggered, on the OSD, select the value "OSD."
7.   Select "Yes" when prompted to "Enable Rule" in order to activate the alarm rule.
8.   Exit the Rule [number] submenu. The rule that you selected is now "Enabled" in the Alarm I/O Setup Menu.

12   Common User Commands

12.1   Configuring Preposition Tours

A **Preposition Tour** automatically moves the camera through a series of preset or saved shots. The MIC camera has one (1) standard preset tour and one (1) customized preset tour. Tour 1 is a standard tour that moves the camera through a series of shots in the sequence that they were set. **Tour 2** is a custom tour that allows you to change the sequence of shots in the tour by inserting and deleting scenes.

To start Preposition Tour 1:
1.   Set a series of preset shots in the order that you want the MIC camera to cycle through.
2.   Press **ON-8-ENTER** to start the tour. The tour then cycles through the series of shots until it is stopped.

To stop a Preposition Tour:
▸   Press **OFF-8-ENTER** or move the joystick to stop either type of tour.

To add or remove scenes to Preposition Tour 1:
1.   Press **SHOT-900-ENTER** to access the **Add/Remove Scenes Menu**.
2.   Use the **Focus/Iris** buttons to add or remove the selected scene from the tour.

To start custom Preposition Tour 2:
▸   Press **ON-7-ENTER** to start a tour. The tour cycles through the series of shots (in the order that they were defined) until it is stopped.

To edit a custom Preposition Tour 2:
1.   Press **SET-900-ENTER** to access the **Add/Remove Menu**.
2.   Press the **Focus/Iris** buttons to add or remove the selected scene.

To change the dwell period of a tour:
1.   Press **ON-15-ENTER** to access the **Tour Period Menu**.
2.   Select the tour (**Tour 1** or **Tour 2**) and follow the on-screen instructions.

12.2   Recording Tours

The MIC camera can make up to two (2) recorded tours. A **Recorded Tour** saves all manual camera movements made during the recording, including its rate of pan, tilt and zoom speeds and other lens setting changes.

To Record Tour A:
1.   Press **ON-100-ENTER** to start recording a tour.
2.   Press **OFF-100-ENTER** to stop recording.

To play back Recorded Tour A:
1.   Press **ON-50-ENTER** to begin continuous playback.
2.   Press **OFF-50-ENTER** or move the joystick to stop playback.

To Record Tour B:
1.   Press **ON-101-ENTER** to start recording the tour.
2.   Press **OFF-101-ENTER** to stop the tour.

To play back Recorded Tour B:
1.   Press **ON-52-ENTER** to begin continuous playback.
2.   Press **OFF-52-ENTER** or move the joystick to stop playback.

12.3   Using the Wiper/Washer (Bosch Protocol)

The "predefined position" for the wash/wipe function is preset 62. The installer must define preset 62 (preferably where the washer nozzle is located and can direct washer fluid towards the camera window) before using the wiper/washer function.

To activate the washer/wiper function, press ON-105-ENTER, and then confirm this sequence:
1.   The wiper moves to a predefined position.
2.   The washer turns on for five seconds. Simultaneously, the wiper turns on and wipes five times.
3.   The washer turns off. The wiper continues wiping for five more wipes as the camera returns to its initial PTZ position (and to inactive mode if applicable).
4.   The wiper turns off.

To activate intermittent wipe:
Press **ON-103-ENTER**. The wiper wipes twice, then returns to parked position, and then turns off 15 seconds later. This sequence will continue for up to 5 minutes or until an OFF-103-ENTER command is sent.

To activate continuous wipe:
Press **ON-102-ENTER**. The wiper wipes continuously for up to 5 minutes, or until another OFF-102-ENTER command is sent (if the command is sent before the 5 minutes elapse). The wiper then turns off automatically.

To activate the wiper to wipe five (5) times:
Press **ON-104-ENTER**. The wiper wipes five (5) times, or until an OFF-104-ENTER command is sent (if the command is sent before the wiper wipes five (5) times), then returns to parked position and turns off.

13   Advanced Features

This chapter details advanced user commands, which are more complicated than those in *Common User Commands, page 76*.

13.1   Alarm Rules

MIC cameras feature a powerful alarm rule engine. In its simplest form, an alarm rule defines those inputs that activate specific outputs. In its more complex form, a rule can be programmed to take any combination of inputs and keyboard commands to perform a camera function. There are numerous combinations of alarm inputs and outputs that can be programmed into twelve (12) alarm rules.

13.1.1   Controlling Alarm Rules

The AUX 69 command allows a user to enable or disable all alarm rules. By default, alarm rules are enabled until the OFF-69-ENTER command is issued from a keyboard (there is no corresponding menu item for this command). Disabling alarms rules does not erase the rule, the MIC camera preserves the user-defined settings and the rule data is restored when the ON-69-ENTER command is issued.

The OFF-69-ENTER command performs the following actions:
–   Disables all alarm rules
–   Displays the message "Ack and Reset Alarms" if an alarm-rule triggered alarm is active when the camera receives the disable command. You must acknowledge the alarm before the rule is disabled.
–   Prevents the modification of an alarm rule while disabled.

13.1.2   Alarm Rule Examples

Following are two examples for setting up alarm rules.

Example 1: Basic Alarm Rule

Scenario: We want a door alarm contact to:
1.   Flash an OSD message (***ALARM 1***) on the display when the alarm is triggered.
2.   Move the MIC camera to a saved position. (For this example, Shot 7.)
3.   Transmit a Bilinx signal over the coax cable to the head-end system, such as an Allegiant, to trigger an alarm response.

The sequence to program the above alarm rule example is as follows:
1.   Wire the door contact to Input 1 in the camera. This circuit is normally open.
2.   Define the Alarm Input(s): From the **Inputs Setup** menu, ensure that Alarm Input 1 is set to **N.O.** (the default setting for Input 1).
3.   Define the Alarm Outputs:
      From the **Outputs Setup** menu, ensure that Output 5 is set to **OSD** (the default setting for Output 5).
      Set Output 6 to **Shot 7**.
      Set Output 7 to **Transmit** (a Bilinx signal to the head end).
4.   Set up the Alarm Rule by selecting the Inputs and Outputs from the **Rule Setup** menu:
      Select **Rule 1**.
      Set the first input to **Alarm Input 1**.
      Set the first output to **OSD**.
      Set the second output to **Shot 7**.
      Set the third output to **Transmit**.
5.   Enable the Alarm Rule: Highlight Enabled and select **YES**.

Example 2: Advanced Alarm Rule

Scenario: A MIC camera located at an airport is set to AutoPan Between Limits from the parking garage to the airport terminal. The gate entering the airport has an alarm contact connected to the camera, and the perimeter fence in the area of the gate has an infrared (IR) sensor for motion detection (motion detector) that is connected to the camera.

When the alarms for the gate contact and the motion detector are activated at the same time, we want the alarm rule to:

1. Flash an OSD message (***ALARM 2***) on the monitor.
2. Stop the AutoPan and move the camera to a saved position (Shot 5) viewing the fence.
3. Transmit a Bilinx signal to the head end system to trigger an alarm response.

The sequence to program this alarm rule example is as follows:

1. Wire and set the alarm Input(s).
    - Wire the motion detector to Input 1. (This circuit is normally open.)
    - Wire the gate alarm contact to Input 5. (This circuit is normally closed.)
2. From the **Inputs Setup** menu:
    - Ensure that Input 1 (the motion detector) is set to **N.O.** (This setting is the default for Input 1.)
    - Ensure that Input 5 (the gate contact) is set to **N.C.**
3. Set the alarm Outputs from the **Outputs Setup** menu:
    - Set Output 5 to **OSD**.
    - Set Output 6 to **Transmit**.
    - Set Output 7 to **Shot 5**.
4. Set up the Alarm Rule by selecting the Inputs and Outputs from the **Rule Setup** menu:
    - Select **Rule 2**.
    - Set the first input to **Alarm Input 1** (the motion detector).
    - Set the second input to **Alarm Input 5** (the gate alarm contact).
    - Set the first output to **OSD**.
    - Set the second output to **Shot5** viewing the fence.
    - Set the third output to **Transmit** (a Bilinx signal to the headend).
5. Enable the Alarm Rule: Highlight Enabled and select **YES**.

13.2   Pre-position Tour

MIC cameras feature two (2) preset tours. Each preset scene is saved for playback later.

Tour 1 is a standard tour that only recalls the scenes in the exact sequence they were shot. Scenes can be added or deleted on the tour, but the sequence cannot be changed. To add or remove scenes on Tour 1 enter the keyboard command **SHOT-900-ENTER** and follow the on-screen instructions.

Tour 2 is a customizable tour that allows you to rearrange the sequence of scenes on the tour by inserting and deleting scenes. To enter the Edit Tour 2 menu, enter the keyboard command **SET-900-ENTER** and follow the on-screen instructions.

13.3   Privacy Masking

Privacy Masking is used to block out a specific area of a scene from being viewed. Each mask changes size and shape smoothly and quickly, ensuring that the covered object cannot be seen. The MIC Series 612 camera allows for a total of 24 individual privacy masks, with up to eight in the same scene. Masks can be programmed with three, four, or five corners each. Each mask can appear in black, white, or blurred. Blurred is useful when privacy is an issue, but determining the presence of motion is still required.

    – To configure a Privacy Mask, open the **Main** menu, select **Display Setup**, and then select **Privacy Mask**. Alternatively, enter the keyboard command **ON-87-ENTER**. To setup a privacy mask, follow the on-screen menu instructions.

    – In Pelco Mode, open the **Pelco Main** menu, open the **Bosch** menu, select the **Display Setup** menu, and then select **Privacy Masking**. To setup a privacy mask, follow the on-screen menu instructions.

> **i**
>
> **Notice!**
> Draw the mask 10% larger than the object to ensure that the mask completely covers the object as the MIC612 zooms in and out.

13.4   Image Stabilization

Image Stabilization becomes increasingly important as zoom ranges are extended. The advanced image stabilization algorithms of the MIC612 eliminate camera shake for exceptional image clarity. Bosch achieves this clarity without reducing camera sensitivity or picture quality. To activate image stabilization, open the **Main** menu, select the **Camera Setup** menu, and then select **Stabilization** to turn on the feature.

13.5   Azimuth, Elevation, and Compass Directions

The MIC550 or the MIC612 allows a user to display the azimuth and elevation position, and the compass heading of the camera. The MIC550 or the MIC612 displays the position data in the lower-right corner of the image display. These readings are described as:

Azimuth The pan angle from zero to 359 degrees in one degree increments. An azimuth of zero degrees corresponds to North.

Elevation The tilt position from zero (horizon) to –90 degrees (camera pointing straight down) in one degree increments.

Compass The cardinal or intercardinal (N, NE, E, SE, S, SW, W, NW) heading in which the camera is pointing.

The MIC550 or the MIC612 uses the azimuth to determine the compass direction. The following table shows the azimuth range and its corresponding compass heading:

Azimuth Range	Compass Direction
21° to 65°	NE (Northeast)
66° to 110°	E (East)
111° to 155°	SE (Southeast)
156° to 200°	S (South)
201° to 245°	SW (Southwest)
246° to 290°	W (West)
291° to 335°	NW (Northwest)
336° to 20°	N (North)

13.5.1   Setting the Azimuth Zero Point

The MIC550 or the MIC612 uses the Azimuth Zero point, usually set to magnetic North, as the zero degree pan position and as the North compass heading. The MIC550 or the MIC612 then displays the azimuth reading and the compass heading based on the number of degrees from the Azimuth Zero point.

⚠ **Caution!**

Bosch recommends that only the installer calibrate the Azimuth Zero point. A recalibration to the Azimuth Zero point may cause inaccurate compass headings.

To set the Azimuth Zero point:

1.   Determine the North compass heading, then move the camera to that position.
2.   Press **OFF-90-ENTER** to turn off the command lock (if active).
3.   Press **ON-94-ENTER** to set the Azimuth Zero point.

13.5.2   Displaying Azimuth, Elevation, and Compass Headings

You can display only the azimuth/elevation readings or only the compass reading, or you can display both readings at the same time. The MIC550 or the MIC612 displays the azimuth/ elevation readings and the compass heading in the following way:

180 / −45 S

where:

–   **180** is the Azimuth or the pan location in degrees.
–   **−45** is the Elevation or the tilt location in degrees.
–   **S** is the compass direction (cardinal or intercardinal).

1.   Press **ON-95-ENTER** to display the azimuth/elevation reading.
2.   Press **ON-96-ENTER** to display the compass heading.
3.   Press **OFF-95-ENTER** to hide the azimuth/elevation reading.
4.   Press **OFF-96-ENTER** to hide the compass heading.

14   Maintenance and Troubleshooting

Cleaning - Unplug the device before cleaning. Generally, using a dry cloth for cleaning is sufficient, but a moist, fluff-free cloth may also be used. Do not use liquid cleaners or aerosol cleaners.

No User-serviceable Parts
Except for the external wiper blade, the device contains no user-serviceable parts. Contact your local Bosch service center for device maintenance and repair. In the event of failure, the device should be removed from site for repair.

On-Site Inspection
It is recommended that the device be inspected on-site every six months to check mounting bolts for tightness, security, and any signs of physical damage. Inspection of this device shall only be carried out by suitably-trained personnel in accordance with the applicable code of practice (for example, EN 60097-17).

Table of Troubleshooting Issues
The table below identifies issues that could occur with the camera, and how to resolve them.

Problem	Questions to Ask/Actions to Resolve the Problem
No camera control.	– Ensure that the LAN cable has good connection and is secured. – Refresh the browser and ensure that video is updated. – Cycle the camera's power off and on.
Video is rolling, noisy, or distorted.	– Check the integrity of all connectors and splices of the Ethernet cable. If O.K., then: – Contact Bosch Technical Support.
Camera moves when attempting to move other cameras.	– Check that the camera's IP address is properly set. If camera's IP address is not set, then: – Use Configuration Manager to confirm that two cameras do not have the same IP address. If they do, change the address of one of the cameras.
No Network Connection.	– Check all network connections. – Ensure that the maximum distance between any two Ethernet connections is 100 m (328 ft) or less. If O.K., then: – If you are behind a firewall, ensure that the Video Transmission mode is set to UDP.
Camera does not operate at all, or does not operate as expected, after being subjected to extreme low temperatures (below -40 ° (-40 °F)).	- Allow the camera to warm up. The camera requires a 60-minute warm-up prior to PTZ operations. - If camera does not operate after this warm-up period, then reset the camera. In the URL line of your web browser, type "/reset" at the end of the IP address of the camera.

Nothing appears on the screen.	Are the power cord and line connection between the camera and monitor made properly?
The image on the screen is dim.	Is the lens dirty? If so, clean the lens with a soft, clean cloth.
The contrast on the screen is too weak.	Adjust the contrast feature of the monitor. Is the camera exposed to strong light? If so, change the camera position.
The image on the screen flickers.	Does the camera face directly into the sun or fluorescent lighting? If so, reposition camera.
The image on the screen is distorted.	Is the power frequency set properly in sync? If the power frequency is not set correctly, the line lock synchronization mode cannot be used. Set the synchronization mode to INT. (NTSC Model power frequency in LL mode: 60 Hz.)
No video.	– Check that the mains power to the power supply is on. – For IP-enabled cameras: Check to see if you have a web page. If you do, then try cycling the camera's power off and on. If you do not, then you may have the wrong IP address. Use Configuration Manager to identify the correct IP address. If O.K., then: – Check that there is 24 V output from the transformer. If O.K., then: – Check the integrity of all wires and mating connectors to the camera.
Picture is dark.	– Check that the Gain Control is set to High. If O.K., then: – Check that the Auto Iris Level is set to the appropriate level. If O.K., then: – Check that the camera lens cover is removed. If O.K., then: – Check that the maximum Ethernet cable distance has not been exceeded. If O.K., then: – Restore all camera settings.
Background is too bright to see subject.	Turn on backlight compensation.

Additional troubleshooting for MIC612 cameras.

Problem	Explanation	Solution
A green square appears intermittently at the upper right of the video output.	This is the Flat Field Imminent Symbol. It warns that FFC is about to begin.	Do nothing; this is normal operation for the thermal camera.
The thermal image appears 'grainy'.	This often occurs when the temperature of the camera fluctuates, such as after the camera is powered on, or when ambient temperature is changing.	Perform a flat-field correction (FFC).

15   Technical data

For product specifications, see the datasheet for your camera, available on the appropriate product pages of the Online Product Catalog at www.boschsecurity.com.

16   Appendices

16.1   Keyboard Commands (Bosch Protocol) By Number

16.1.1   Commands, Optical Camera

Locked	Function Key	Command No.	Command	Description
	On/Off	1	Scan 360° / Auto Pan (Continuous)	Activates/deactivates Autopan without limits.
	On/Off	2	Autopan (within Limits)	Activates/deactivates Autopan between limits.
*	On/Off	3	Iris Control	Enters the menu (auto, manual) for iris control.
*	On/Off	4	Focus Control	Enters the menu (spot, auto, manual) for focus control.
	On/Off	7	Play Custom Pre-position Tour	Activates/Deactivates the playback of a custom, pre-position tour.
	On/Off	8	Play Pre-position Tour	Activates/Deactivates the playback of a pre-position tour.
*	On/Off	9	Inactivity Mode	Enters the inactivity menu (Off, Return to Scene 1, Recall Previous PTZ Command).
*	On/Off	11	Auto Iris Level Adjust	Enters the Iris Level Adjustment menu.
	On/Off	14	Set Autopan and Scan Speed	Enters the speed adjustment slide bar.
	On/Off	15	Set Pre-position Tour Period (dwell)	Enters the dwell adjustment slide bar.
*	On/Off	18	AutoPivot Enable	Enables/disables AutoPivot.
	On/Off	20	Backlight Comp	Turns Backlight Compensation on or off.
*	On/Off	23	Electronic Shutter	Enters the Shutter Speed slide bar.
	On/Off	24	Stabilization	Turns Electronic Stabilization on or off.
	On/Off	26	Wide Dynamic Range	Activates/deactivates Wide Dynamic Range.
	On/Off	30	White Balance	Enters the White Balance menu.
*	On/Off	35	Fixed White Balance	Enters the White Balance menu.
*	On	40	Restore Camera Settings	Restores all settings to their original defaults.
*	On/Off	43	Auto Gain Control	Switches AGC modes (On, Auto, Off).
*	On/Off	44	Aperturn Correction (Sharpness)	Enters the Sharpness menu.
*	On	46	Advanced Menu	Enters the Main Setup menu.
	On	47	View Factory Settings	Displays all menu default settings.

Locked	Function Key	Command No.	Command	Description
	On/Off	50	Playback A, continuous	Activates/Deactivates continuous playback A.
	On/Off	51	Playback A, single	Activates/Deactivates single playback A.
	On/Off	52	Playback B, continuous	Activates/Deactivates continuous playback B.
	On/Off	53	Playback B, single	Activates/Deactivates single playback B.
	On/Off/	56	Night Mode Menu	Enters the Night Mode memnu (On, Off; Auto (Day/Night only))
	On/Off	57	Night Mode Control (IR Filter In/Out)	Enables/disables Night Mode (Day = Off / Night = On).
*	On/Off	58	Day/Night Threshold	Enables/disables the day/nigh threshold (On–menu (Day/Night only)).
	On/Off	59	Night Mode Priority	Motion–Activates Night Mode before slow shutter, preserving full-frame integration as light is reduced. Color–Activates slow shutter before Night Mode, preserving color longer as light is reduced.
*	On/Off	60	On Screen Display	On–Enables on-screen display. Off–Disables on-screen display.
*	On	61	OSD Display (Adjust)	Adjusts the view of the On-screen Display.
	On	62	Pre-position (Scene) Title menu	Enters the Pre-position Title menu. Refer to Specifying a Shot or a Sector Title.
*	On	63	Zone/Sector Title Menu	Enters the Zone Title menu. Refer to Specifying a Shot or a Sector Title.
	On	64	Alarm Status	Enters the Alarm Status menu.
	Off	65	Alarm Acknowledge	Acknowledges alarms or deactivates physical outputs.
	On	66	Display Software Version	Displays the number of the software version.
	On/Off	67	Focus Adjust for IR Illuminators	On - Automatically adjusts camera focus with IR illumination is present.
*	On/Off	69	Alarm Rule Activation/Deactivation	On–Enables all alarm rules. Off–Disables all alarm rules.
	On	72	Re-initialize Camera	Performs camera/lens re-initialization functions.
*	On/Off	80	Digital Zoom Lock	Turns digital zoom on and off.

Locked	Function Key	Command No.	Command	Description
	On/Off	81	Alarm Output 1 Open Collector	On–Activates output. Off–Deactivates output.
	On/Off	82	Alarm Output 2 Open Collector	On–Activates output. Off–Deactivates output.
	On/Off	83	Alarm Output 3 Open Collector	On–Activates output. Off–Deactivates output.
	On/Off	84	Alarm Relay	On–Activates alarm relay. Off–Deactivates alarm relay.
*	On/Off	86	Sector Blanking / Masking	Enters / Exits the Sector Blanking menu.
*	On/Off	87	Privacy Masking	Enters / Exits the Privacy Masking menu.
	On/Off	89	Preposition Overwrite Confirmation (toggle)	On–Isues a message that prompts for approval to overwrite a preposition. Off–No confirmation message issued.
	On/Off	90	Command Lock/Unlock	On–Lock on Off–Lock off
*	On/Off	91	Zoom Polarity	On–Reverse Off–Normal
*	On/Off	92	Focus Polarity	On–Reverse Off–Normal
*	On/Off	93	Iris Polarity	On–Reverse Off–Normal
*	On/Off	94	Set Azimuth Zero Point / Recalibrate Azimuth Compass	Sets the zero degree pan position. Refer to *Azimuth, Elevation, and Compass Directions, page 80*.
	On/Off	95	Display Azimuth/Elevation Readings	On–Displays azimuth/elevation readings. Off–Hides azimuth/elevation readings. Refer to *Azimuth, Elevation, and Compass Directions, page 80*.
	On/Off	96	Display Compass (Point) Readings	On–Displays compass heading. Off–Hides compass heading. Refer to *Azimuth, Elevation, and Compass Directions, page 80*.
	On/Off	97	Video channel (toggle)	On - Switches view to thermal camera. Off - Switches view to optical camera.
	On	99	Factory P/T Home Position	Recalibrates home position; can be used as an Alarm Output.
	On/Off	100	Record A	Activates/deactivates recording A.
	On/Off	101	Record B	Activates/deactivates recording B.

Locked	Function Key	Command No.	Command	Description
	On/Off	102	Wiper continuous	Turns on/off continous wiper mode.
	On/Off	103	Wiper intermittent	Activates the wiper in Intermittent mode (the wiper wipes twice, then turns off after 15 seconds).
	On/Off	104	Wiper one shot	Activates (One shot) to wipe five times, then turn off.
	On/Off	105	Wash/Wipe	Activates wash/wip mode. Cameras moves to designated washer preset (62), wiper starts automatically.
	On	997	FastAddress, display	Display the current FastAddress of the camera.
	On	998	FastAddress, all units	Displays the current FastAddress of the camera and programs all units.
	On	999	FastAddress, unaddressed cameras	Displays and programs unaddressed MIC units.
	Set	"1-99"	Pre-position Programming	Set ##–Programs a preset view.
	Shot	"1-99"	Pre-position Recall	Shot ##–Recall programmed preset.
	Set	100	Pre-position Menu	Enters the Pre-position menu.
	Set/Shot	101	Autopan Left Limit	Set–Programs left limit. Shot–Shows limit.
	Set/Shot	102	Autopan Right Limit	Set–Programs right limit. Shot–Shows limit.
	Set	110	Factory P/T Home Position	Set–Recalibrate home position.
*	Set	802	Edit Password	Enters the Edit Password menu.
*	Set	899	Reset ALL	Restores all settings to original defaults and clears all user-programmed settings.
	Set	900	Edit Tour 1 (Standard)	Enters the Standard Tour Scene menu.
	Shot	900	Edit Tour 2 (Custom)	Enters the Custom Tour Scene menu.
	Set/Shot	901-999	Adds/Removes a Preposition Shot from Tour 1	Set ###–Adds preset. Shot ###–Removes preset.

16.1.2   Commands, Thermal Camera

Locked	Function Key	Command No.	Command	Description
	On/Off	1	Scan 360°	Autopan without limits.
	On/Off	2	Autopan	Autopan between limits.

Locked	Function Key	Command No.	Command	Description
	On/Off	7	Play Custom Pre-position Tour	Activates/Deactivates the playback of a custom, pre-position tour.
	On/Off	8	Play Pre-position Tour	Activates/Deactivates the playback of a pre-position tour.
*	On/Off	18	AutoPivot Enable	Enables/disables AutoPivot.
	On/Off	50	Playback A, continuous	Activates/Deactivates continuous playback A.
	On/Off	51	Playback A, single	Activates/Deactivates single playback A.
	On/Off	52	Playback B, continuous	Activates/Deactivates continuous playback B.
	On/Off	53	Playback B, single	Activates/Deactivates single playback B.
*	On/Off	69	Alarm Rule Activation/Deactivation	On–Enables all alarm rules. Off–Disables all alarm rules.
*	On/Off	80	Digital Zoom Lock	Turns digital zoom on and off.
	On/Off	81	Alarm Output 1 Open Collector	On–Activates output. Off–Deactivates output.
	On/Off	82	Alarm Output 2 Open Collector	On–Activates output. Off–Deactivates output.
	On/Off	83	Alarm Output 3 Open Collector	On–Activates output. Off–Deactivates output.
	On/Off	84	Alarm Output 4 Relay	On–Activates output. Off–Deactivates output
	On/Off	88	Proportional PTZ	On–Activates Proportional PTZ. Off–Deactivates Proportional PTZ.
	On/Off	90	Command Lock/Unlock	On–Turns on the lock. Off–Turns off the lock.
	On/Off	97	Video channel (toggle)	On - Switches view to thermal camera. Off - Switches view to optical camera.
	On	99	Factory P/T Home Position	Recalibrates home position; can be used as an Alarm Output.
	On/Off	100	Record A	Activates/Deactivates recording A.
	On/Off	101	Record B	Activates/Deactivates recording B.
		102	Wiper alarm	Turns the wiper alarm on/off manually.
		103	Wiper wipe	Activates the wiper in Intermittent mode (the wiper wipes twice, then turns off after 15 seconds).

Locked	Function Key	Command No.	Command	Description
		104	Wiper wipe	Activates (On shot) to wipe five times, then turn off.
		105	Washer/Wiper	Activates the washer/wiper.
	On	454	White Hot	Activates thermal display mode White Hot.
	Off	454	Black Hot	Activates thermal display mode Black Hot.
	On	455	Ice Fire	Activates thermal display mode Ice Fire.
	Off	455	Globow	Activates thermal display mode Globow.
	On	456	Ironbow 1	Activates thermal display mode Ironbow 1.
	Off	456	Ironbow 2	Activates thermal display mode Ironbow 2.
	On	457	Rainbow	Activates thermal display mode Rainbow.
	Off	457	Fusion	Activates thermal display mode Fusion.
	On	458	Sepia	Activates thermal display mode Sepia.
	Off	458	Rain	Activates thermal display mode Rain.
	On	459	Color 1	Activates thermal display mode Color 1.
	Off	459	Color 2	Activates thermal display mode Color 2.
	On	460	Red Hot	Activates thermal display mode Red Hot.
	Off	460	Green Hot	Activates thermal display mode Green Hot.
	On	463	SPOT meter display	Activates the SPOT meter.
	Off	463	SPOT meter display	Deactivates the SPOT meter.
	On	997	FastAddress, display	Display the current FastAddress of the camera.
	On	998	FastAddress, all units	Displays the current FastAddress of the camera and programs all units.
	On	999	FastAddress, unaddressed cameras	Displays and programs unaddressed MIC units.
	Set	"1-99"	Pre-position Programming	Set ##–Programs a preset view.
	Shot	"1-99"	Pre-position Recall	Shot ##–Recall programmed preset.
	Set/ Shot	100	Pre-position Store/Clear	Enters/ Exits pre-position menu.
	Set/ Shot	101	Autopan Left Limit	Set–Programs left limit. Shot–Shows limit.
	Set/ Shot	102	Autopan Right Limit	Set–Programs right limit. Shot–Shows limit.
	Set/ Shot	103	Lock Commands	Locks commands.

Locked	Function Key	Command No.	Command	Description
	Set/Shot	104	Unlock Commands	Unlocks commands.
	Set/Shot	106	Pre-wash position	Sets the camera in pre-wash position.
	Set	110	Factory P/T Home Position	Recalibrates home position.