



MIC612 Thermal Camera

MIC612



BOSCH

en Installation 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 Conventions in this Manual

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



DANGER!

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!

Indicates a potentially hazardous situation. If not avoided, this could result in serious bodily injury or death.



CAUTION!

Medium Risk

Indicates a potentially hazardous situation. If not avoided, this may result in minor or moderate injury. Alerts the user to important instructions accompanying the unit.



CAUTION!

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.

1.3 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.

1.4 Important Safety Instructions

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

**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 IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE, ANSI/NFPA, CANADIAN ELECTRIC CODE, AND ALL LOCAL COUNTRY CODES.

BOSCH SECURITY SYSTEMS ACCEPTS NO LIABILITY FOR ANY DAMAGES OR LOSSES CAUSED BY INCORRECT OR IMPROPER INSTALLATION.

**WARNING!**

INSTALL EXTERNAL INTERCONNECTING CABLES IN ACCORDANCE WITH NEC, ANSI/NFPA70 (FOR US APPLICATION) AND CANADIAN ELECTRICAL CODE, PART I, CSA C22.1 (FOR CAN APPLICATION), AND IN ACCORDANCE WITH 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. 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.

1. Install according to the manufacturer's instructions.
2. Do not install near any heat sources such as furnaces, radiators, heaters, stoves, or other equipment (including amplifiers) that produce heat.
3. Do not install the camera's power supply near water (for example, near a bathtub, washbowl, or swimming pool).
4. Use common sense safety precautions, especially in situations where there could be risk of injury if any part of the assembly becomes detached and falls. A strong safety chain between the camera pan shaft and the mounting surface is recommended.
5. Do not open the camera unit. Doing so will void the warranty.
6. Use only the power source indicated in this manual. Ensure that the rating of current of the supply cable is adequate for the unit.
7. Disconnect the power before moving the unit. Move the unit with care. Excessive force or shock may damage the unit.



Do not place this camera on an unstable stand, tripod, bracket, or mount. The unit may fall, causing serious injury and/or serious damage to the unit. When a cart is used, use caution and care when moving the cart/camera combination to avoid injury from tip-over. Quick stops, excessive force, or uneven surfaces may cause the cart and/or camera to overturn. Mount the camera per the manufacturer's instructions, and only with MIC mounting accessories.

For transportation, rotate the ball so that the window points toward the base. This will protect the wiper and the windows during transit.

8. 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.
9. Do not back drive the pan or tilt axis of the camera. Doing so will damage the motor drive gear chain and will invalidate the warranty.

**NOTICE!**

This device is intended for use in public areas only.
U.S. federal law strictly prohibits surreptitious recording of oral communications.

1.5**EC Directives**

The MIC612 complies with the following EC directives:

- EMC Direct (89/336/EC as amended)
- Machinery Directive (98/37/EC)
- LV Directive (73/23/EC)
- RoHS (Restriction of Hazardous Substances) 2002/95/EC
- WEEE (Waste Electrical and Electronic Equipment) 200/96/EC

**NOTICE!**

This equipment contains electrical or electronic components that must be recycled properly in order to comply with Directive 2002/96/EC of the European Union regarding the disposal of waste electrical and electronic equipment (WEEE). Contact your local supplier for procedures for recycling this equipment.



Environmental statement - This symbol means that electronic and electrical appliances which have reached the end of their working life must be collected and disposed of separately from household waste material. Separate collecting systems are usually in place for electronic and electrical products. Please dispose of these units at an environmentally compatible recycling facility, per *European Directive 2002/96/EC*.

Bosch has a strong commitment towards the environment. The camera was designed and manufactured with high-quality material and components that can be recycled and reused.

1.6**Important Notices**

Cold Start-ups - If camera is powered up in extremely cold temperature (for example, -40°C), please allow 30 minutes warm-up after powering camera prior to operation. In some cases, camera may require soft reset (Aux ON 911) or a power cycle before usable video is available.

Ventilation - The camera is a completely sealed unit and requires no special consideration as regards to ventilation.

Object and liquid entry - With the exception of the base connector, the camera can be exposed to non corrosive liquids without damage. Never push objects into the base connector as this may damage the connection pins and prevent the camera operating correctly.

Lightning - For added protection during a lightning storm, or when leaving this unit unattended and unused for long periods, unplug the unit from the wall outlet and disconnect the cable system. This will prevent damage to the unit from lightning and power line surges.

Power sources - Operate the unit only from the type of power source indicated on the label. Before proceeding, disconnect the power from the cable to be installed into the camera.

- For external power supplied units, use only the recommended or approved power supplies.
- For limited power source units, this power source must comply with *EN60950*. Substitutions may damage the unit or cause fire or shock.

- For 18 VAC units, voltage applied to the unit's power input should not exceed $\pm 10\%$. User-supplied wiring must comply with local electrical codes (Class 2 power levels). Do not ground the supply at the terminals or at the unit's power supply terminals.
- If unsure of the type of power supply to use, contact your dealer or local power company.

Video loss - Video loss is inherent to digital video recording; therefore, Bosch Security Systems cannot be held liable for any damage that results from missing video information. To minimize the risk of lost digital information, Bosch Security Systems recommends multiple, redundant recording systems, and a procedure to back up all analog and digital information.

Camera signal - Protect the cable with a primary protector if the camera signal is beyond 140 feet, in accordance with *NEC800 (CEC Section 60)*.

Camera grounding - For mounting the camera in potentially damp environments, ensure to ground the system using the ground connection of the power supply connector (see section: Connecting external power supply).

Coax grounding:

- Ground the cable system if connecting an outside cable system to the unit.
- Connect outdoor equipment to the unit's inputs only after this unit has had its grounding plug connected to a grounded outlet or its ground terminal is properly connected to a ground source.
- Disconnect the unit's input connectors from outdoor equipment before disconnecting the grounding plug or grounding terminal.
- Follow proper safety precautions such as grounding for any outdoor device connected to this unit.

Grounding and polarization - This unit may be equipped with a polarized alternating current line plug (a plug with one blade wider than the other blade). This safety feature allows the plug to fit into the power outlet in only one way. If unable to insert the plug fully into the outlet, contact a locally certified electrician to replace the obsolete outlet. Do not defeat the safety purpose of the polarized plug.

U.S.A. models only - *Section 810 of the National Electrical Code, ANSI/NFPA No.70*, provides information regarding proper grounding of the mount and supporting structure, grounding of the coax to a discharge unit, size of grounding conductors, location of discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.

Fuse rating - For security protection of the device, the branch circuit protection must be secured with a maximum fuse rating of 16A. This must be in accordance with *NEC800 (CEC Section 60)*.

Alternately, this unit may be equipped with a 3-pole grounding plug (a plug with a third pin for earth grounding). This safety feature allows the plug to fit into a grounded power outlet only. If unable to insert the plug into the outlet, contact a locally certified electrician to replace the obsolete outlet. Do not defeat the safety purpose of the grounding plug.

Permanently connected equipment - Incorporate a readily accessible disconnect device in the building installation wiring.

Pluggable equipment - Install the socket outlet near the equipment so it is easily accessible.

Overloading - Do not overload outlets and extension cords. This can cause fire or electrical shock.

Controls adjustment - Adjust only those controls specified in the operating instructions. Improper adjustment of other controls may cause damage to the unit.

Attachments, changes or modifications - Only use attachments/accessories specified by Bosch. Any change or modification of the equipment, not expressly approved by Bosch, could void the warranty or, in the case of an authorization agreement, authority to operate the equipment.

1.7 FCC and ICES Compliance



NOTICE!

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

FCC & ICES Information

(U.S.A. and Canadian Models Only)

This equipment has been tested and found to comply with the limits for a **Class B** digital device, pursuant to *part 15* of the *FCC Rules*. These limits are designed to provide reasonable protection against harmful interference in a **residential installation**. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- reorient or relocate the receiving antenna;
- increase the separation between the equipment and receiver;
- connect the equipment into an outlet on a circuit different from that to which the receiver is connected;
- consult the dealer or an experienced radio/TV technician for help.

Intentional or unintentional modifications, not expressly approved by the party responsible for compliance, shall not be made. Any such modifications could void the user's authority to operate the equipment. If necessary, the user should consult the dealer or an experienced radio/television technician for corrective action.

The user may find the following booklet, prepared by the Federal Communications Commission, helpful: *How to Identify and Resolve Radio-TV Interference Problems*. This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.

INFORMATIONS FCC ET ICES

(modèles utilisés aux États-Unis et au Canada uniquement)

Suite à différents tests, cet appareil s'est révélé conforme aux exigences imposées aux appareils numériques de **classe B**, en vertu de la *section 15 du règlement* de la *Commission fédérale des communications des États-Unis (FCC)*, et en vertu de la norme *ICES-003 d'Industrie Canada*. Ces exigences visent à fournir une protection raisonnable contre les interférences nuisibles lorsque l'appareil est utilisé dans le cadre d'une **installation résidentielle**. Cet appareil génère, utilise et émet de l'énergie de radiofréquences et peut, en cas d'installation ou d'utilisation non conforme aux instructions, engendrer des interférences nuisibles au niveau des radiocommunications. Toutefois, rien ne garantit l'absence d'interférences dans une installation particulière. Il est possible de déterminer la production d'interférences en mettant l'appareil successivement hors et sous tension, tout en contrôlant la réception radio ou télévision. L'utilisateur peut parvenir à éliminer les interférences éventuelles en prenant une ou plusieurs des mesures suivantes:

- Modifier l'orientation ou l'emplacement de l'antenne réceptrice;
- Éloigner l'appareil du récepteur;
- Brancher l'appareil sur une prise située sur un circuit différent de celui du récepteur;
- Consulter le revendeur ou un technicien qualifié en radio/télévision pour obtenir de l'aide.

Toute modification apportée au produit, non expressément approuvée par la partie responsable de l'appareil, est strictement interdite. Une telle modification est susceptible d'entraîner la révocation du droit d'utilisation de l'appareil.

La brochure suivante, publiée par la Commission fédérale des communications (FCC), peut s'avérer utile : *How to Identify and Resolve Radio-TV Interference Problems (Comment identifier et résoudre les problèmes d'interférences de radio et de télévision)*. Cette brochure est disponible auprès du U.S. Government Printing Office, Washington, DC 20402, États-Unis, sous la référence n° 004-000-00345-4.

1.8 Bosch Notices

Disclaimer

Underwriter Laboratories Inc. ("UL") has not tested the performance or reliability of the security or signaling aspects of this product. UL has only tested fire, shock and/or casualty hazards as outlined in UL's *Standard(s) for Safety for Closed Circuit Television Equipment, UL 2044* and in *Standard(s) for Safety for Information Technology Equipment, UL 60950-1*. UL Certification does not cover the performance or reliability of the security or signaling aspects of this product.

UL MAKES NO REPRESENTATIONS, WARRANTIES, OR CERTIFICATIONS WHATSOEVER REGARDING THE PERFORMANCE OR RELIABILITY OF ANY SECURITY OR SIGNALING-RELATED FUNCTIONS OF THIS PRODUCT.

1.9 Customer Support and Service

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

USA

Repair Center

Telephone: 800-566-2283 / Fax: 800-366-1329

E-mail: repair@us.bosch.com

Customer Service

Telephone: 888-289-0096 / Fax: 585-223-9180

E-mail: security.sales@us.bosch.com

Technical Support

Telephone: 800-326-1450 / Fax: 585-223-3508 or 717-735-6560

E-mail: technical.support@us.bosch.com

Canada

Telephone: 514-738-2434 / Fax: 514-738-8480

Europe, Middle East, Africa Region

Repair Center

Telephone: 31 (0) 76-5721500 / Fax: 31 (0) 76-5721413

E-mail: RMADesk.STService@nl.bosch.com

Asia Region

Repair Center

Telephone: 65 63522776 / Fax: 65 63521776

E-mail: rmahelpdesk@sg.bosch.com

Customer Service

Telephone: 86 (0) 756 7633117 or 86 (0) 756 7633121 / Fax: 86 (0) 756 7631710

E-mail: customer.service@cn.bosch.com

For additional information and warranty queries, please contact your Bosch Security Systems representative or visit our website at www.boschsecurity.com.

2 Unpacking



CAUTION!

Take extra care lifting or moving MIC612 cameras because of their weight.

- This equipment, although ruggedized, 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.

2.1 Parts List

The package containing the MIC Series 612 camera should include the following items:

Quantity	Part
1	MIC Series 612 Thermal Camera
1	MIC Series 612 Installation Manual (this booklet)
4	M8 stainless screws and washers
1	Nebar gasket

2.2 Additional Products Required

The following table lists additional products, sold separately by Bosch or other manufacturers, required to operate MIC Series 612 cameras:

Quantity	Product	Part Number	Size
1 per MIC612	Shielded Composite Cable for MIC thermal 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
1 per MIC612	Power Supply Unit (PSU) for thermal cameras	MIC-240PSU-2 or MIC-115PSU-2	
--	Mounting accessories		
1	BNC terminal connector	--	

2.3 Additional Tools Required

The following table lists additional tools required (not supplied by Bosch):

Quantity	Part
1	13 mm wrench for the PCD foot, fixing bolts
1	3 mm screwdriver for the terminal blocks in the MIC PSU
1	8 mm screwdriver for captive screws for MIC PSU enclosure
1	safety chain
1	Silicone sealant for ensuring a water tight seal [if not using the Nebar gasket]

3 Installation Overview

**CAUTION!**

Installation should be made by qualified service personnel and conform to the National Electrical Code and applicable local codes.

The MIC Series cameras are designed for easy installation on a variety of common fittings. The most common type of mount used is a dedicated CCTV camera pole where the camera is bolted directly to the top using industry-standard 4 in. (101.6 mm) fitting. This type of camera pole provides a robust mounting platform that minimizes camera motion and typically has a large base cabinet for mounting ancillary equipment such as power supplies.

The camera can also be mounted on lamp post columns using the Pole Mount Bracket (MIC-PMB); however, users should be aware that lamp posts can often be subject to movement and are not suitable platforms in all conditions or for all applications.

For mounting directly onto buildings, Bosch Security Systems manufactures a range of brackets suitable for all typical building installations for upright (90°) or inverted positions.

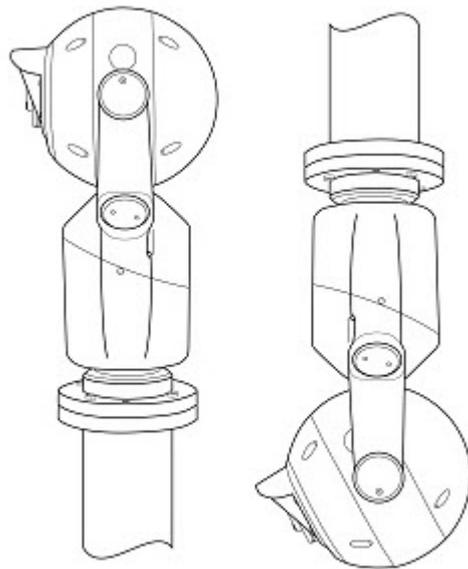


Figure 3.1 MIC camera mounting positions: Inverted, and Upright (Graphic is not of MIC612)

The camera's adaptability enables easy integration in a wide variety of mobile and re-deployable installations. These have included lifeboats and other surface/subsurface vessels, emergency service vehicles, highway agency vehicles, council/contractor parking enforcement vehicles, and crowd-control vehicles.

3.1 Typical Mounting Arrangements

Below are examples of typical mounting arrangements for MIC Series cameras.

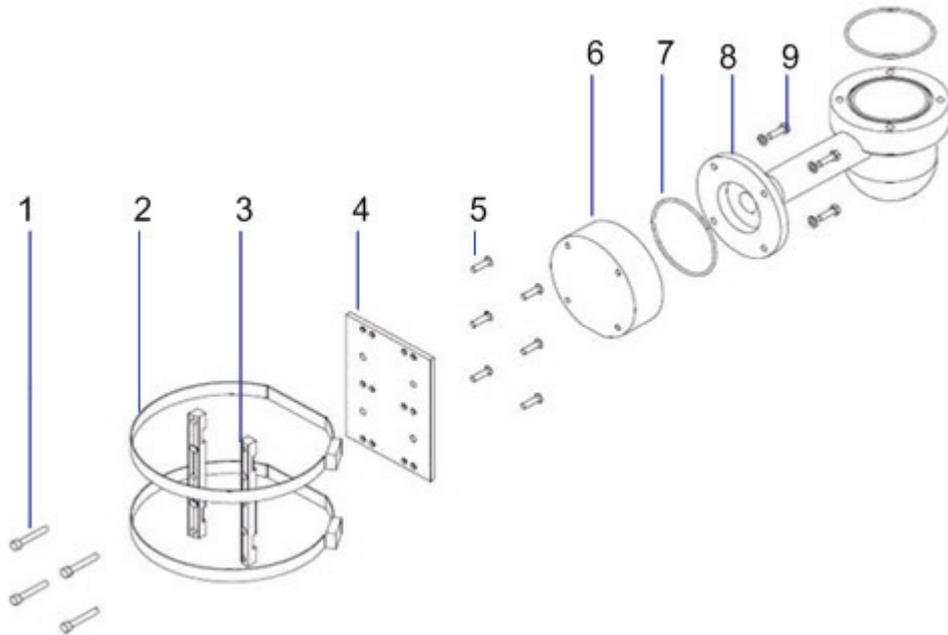


Figure 3.2 Typical pole mount (showing Pole Mount Bracket (MIC-PMB) with Shallow Conduit Adapter (MIC-SCA) and Wall Mount Bracket (MIC-WMB))

Number	Description
1	Securing bolts for Shallow Conduit Adapter
2	90 mm stainless steel pole banding
3	Blocks for Pole Mount Bracket
4	Plate for Pole Mount Bracket
5	Securing bolts for plate for Pole Mount Bracket
6	Shallow Conduit Adapter
7	“O” ring
8	Wall Mount Bracket
9	Securing bolts for Wall Mount Bracket

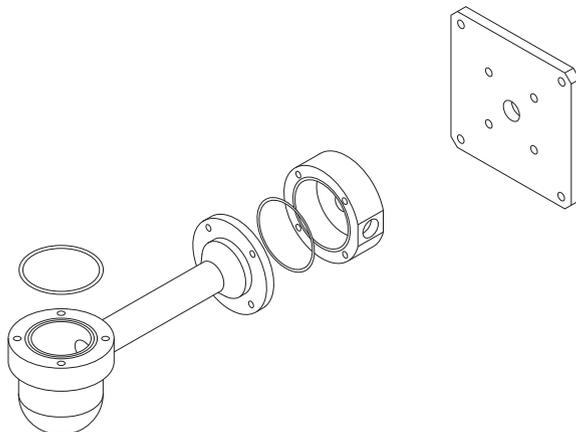


Figure 3.3 Wall Mount Bracket (MIC-WMB) with Shallow Conduit Adapter (MIC-SCA) and Spreader Plate (MIC-SPR)

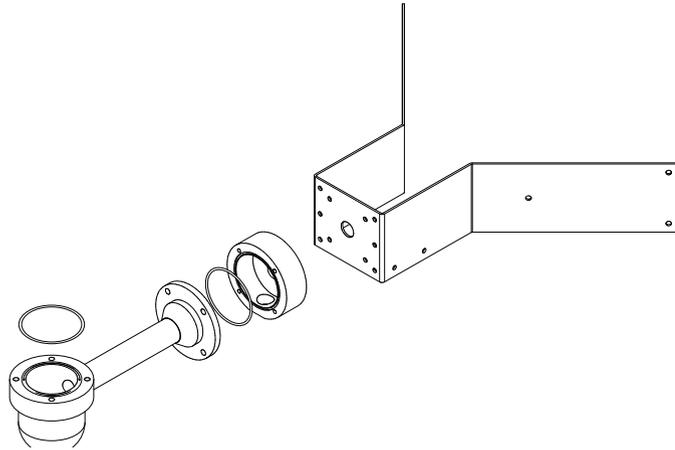


Figure 3.4 Typical corner mount (from left to right: Wall Mount Bracket (MIC-WMB), Shallow Conduit Adapter (MIC-SCA), and Corner Mount Bracket (MIC-CMB))

3.2 Mounting Positions



CAUTION!

The upright unit can be mounted either with the camera ball up or down. To get the picture the correct way for installation with the camera ball down, rotate the camera tilt axis 180°. If the camera is mounted ball down, it is essential that the connector and base area of the camera are completely sealed from water ingress. Any water getting into the connector is liable to cause corrosion to the connector pins, leading to unreliable operation of the camera unit. To prevent water penetrating the composite cable connector threads, seal the 25 mm thread at final installation using PTFE tape. Alternately, a suitable sealant may be liberally applied to the thread prior to final tightening.

MIC Series 612 cameras are designed to be mounted upright (straight up, 90°) or inverted (straight down, 90°). See the figure below for the correct ways to mount the camera.

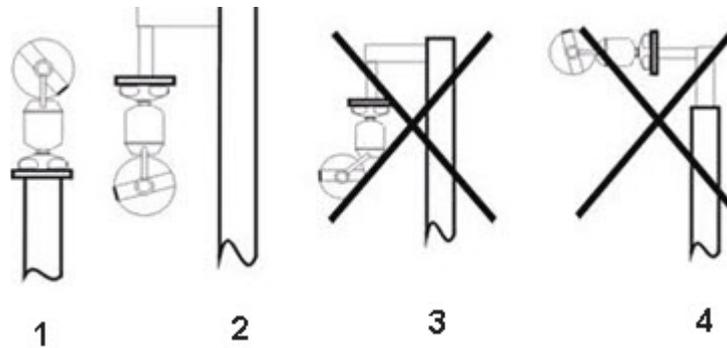


Figure 3.5 Mounting diagram: Correct ways (left) and Incorrect ways (right)

Number	Description
1	Correct way, Upright
2	Correct way, Inverted
3	Incorrect way, Inverted and canted
4	Incorrect way, inverted on top of pole

3.3 About the MIC Shielded Composite Cable

MIC shielded composite cables are 2-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 14-pin connector 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.

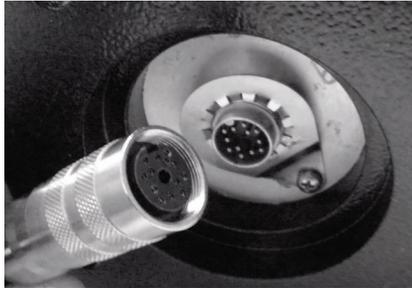


Figure 3.6 Composite cable before connection to a MIC camera



Figure 3.7 Composite cable connected to a MIC camera



NOTICE!

Bosch does not recommend using the composite cable for distances greater than 25 m between the MIC camera and the power supply.

3.4 About the Video Connection

The table below identifies the recommended cable types, maximum distance, and other specifications for the coax video connection between the MIC camera and the power supply.

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

3.5 About Alarm Inputs and Outputs

The table below identifies the number of alarm inputs and outputs available with and without an 8-input alarm card installed in the MIC PSU.

Alarm Card Installed?	Number of Alarm Inputs	Number of Alarm Outputs
Yes	8	2
No	1	0

4 Installation

**CAUTION!**

Installation must be made by qualified personnel and conform to ANSI/NFPA 70 (the National Electrical Code® (NEC)), Canadian Electrical Code, Part I (also called CE Code or CSA C22.1), and all applicable local codes. Bosch Security Systems, Inc. accepts no liability for any damages or losses caused by incorrect or improper installation.

**CAUTION!**

Ensure that a strong safety chain is used to secure the MIC camera to prevent any danger of dropping the product during installation. Particular care should be taken with MIC612 models because of the additional weight.

4.1 Overview of Installation Steps

Follow these steps in sequence to install the MIC612 camera.

Note: Depending on your desired mounting position and location, as well as your chosen accessories, you may not need to complete every step.

1. **Mount the camera.** See *Section 4.2 Mounting the Camera, page 17.*
2. **Install the power supply unit (PSU).** See *Section 4.3.4 Installation Instructions, page 21.*
3. **Make the necessary connections** for power, telemetry, and video. See *Section 4.3.4 Installation Instructions, page 21.*
4. **Connect the camera to the computer.** See *Section 5 Getting Started.*
5. **Configure the camera for inverted operation** (for cameras mounted in inverted position). See *Section 5.6 Configuring the Camera for Inverted Operation, page 34.*
6. **Fit the optional sunshield.** See *Section 4.4 Fitting the Optional Sunshield (MIC612), page 27.*

4.2 Mounting the Camera

**CAUTION!**

Fasteners are not supplied with MIC612 cameras because the type of fastener used depends on the material to which the fastener is attached. The material must accommodate a minimum pull-out strength of 275 kg (600 lbs.) Fasteners can include wedge anchors, sleeve anchors, single expansion anchors, double expansion anchors, machine screw anchors, or "Thru-Bolting" with a nut. All fasteners must be made of 303(A2) stainless steel, at a minimum, with a diameter of 8 mm (5/16-in). All bolts must fully extend through the mounting surface and be secured with a flat washer, lock washer, and a nut. All studs must be anchored to concrete or welded to a steel backing plate. Anchor bolts can be used for blind structures where there is no access to the rear.

To mount a MIC Series camera, follow these steps:

1. Identify a secure location for the mount and for the camera. Locate the mounting position so that the camera cannot be interfered with intentionally or accidentally. Ensure that the installation location has the appropriate clearance from power and lightning conductors, in accordance with *NEC725* and *NEC800 (CEC Rule 16-224 and CEC Section 60)*. Do not install the camera near:
 - Any heat sources
 - Any overhead power lines, power circuits, or electrical lights, or where it may contact power lines, circuits, or lights

2. Ensure that the mounting surface is capable of supporting the combined weight of the camera and mounting hardware under all expected conditions of load, vibration, and temperature. MIC612 cameras must be secured to one of the following surfaces:
 - Concrete Solid/Cast
 - Concrete Masonry Unit (Concrete Block)
 - Brick (all types)
 - Metal (Steel/Aluminum, minimum 1/8-in. thick)

Note: If the camera is positioned in a highly exposed area where lightning strikes may occur, it is recommended to install a lightning conductor within 0.5 m of the camera and at least 1.5 m higher than the camera. The construction of the housing itself is capable of coping with secondary strikes. If the correct lightning protection is applied, no damage to the internal electronics or camera should result. An earth bonding connection to the case also provides protection against damage from secondary strikes. (See step 8.)
3. Fit the mounting brackets securely, observing all appropriate safety precautions and local building regulations.
4. Carefully lift the camera to the mounting point.
5. Attach the security attachment point to a safety chain (not supplied).
6. Attach the safety chain to a secure part of your mounting structure.
7. Connect the female 14-pin connector end of the shielded composite cable to the male plug in the base of the camera. Screw the cable connector sleeve onto the plug until it is firmly secured (approximately four (4) turns from the start of thread engagement).
8. Earth the camera using one of the securing supplied bolts. Only earth the camera at a single point to prevent earth loops and video distortion (hum bars), caused by electrical interference, from appearing on the camera picture in the control room. Please note the following:
 - The camera module and housing are electrically isolated, so the housing should be safety earthed regardless. The safety earth should be a bonding connection (for example, one of the securing bolts) to the camera's outside case, and should be attached to the Earth terminal post on the PCD base of the camera.
 - If the system is copper throughout and the camera pictures are fed back to the control room via coaxial copper cable, then the camera should be earthed only at the video termination point in the control room. In this case, the "Earth Link" on the PCB should be broken. Refer to
 - If the video is transmitted back to the control room via some non-electrical connecting medium (for example, fiber optic, radio, or microwave link), then the camera should be earthed at the transmitter point in the power supply unit. The PSU "Earth Link" may be used for this purpose.
 - If dual earthing is unavoidable, then a video isolation transformer should be fitted between the two earths.
9. Use M8 x 20 mm stainless steel nuts, bolts, and washers to secure the PCD base of the camera to the mounting bracket. An additional Nebar gasket or suitable silicone sealant can be used to ensure a water tight seal between the base and mounting surface. Tighten all bolts securely.
10. Secure all cabling and conduit.

**WARNING!**

If the camera is mounted ball down, it is essential that the connector and base area of the camera are completely sealed from water ingress. Any water getting into the connector is liable to cause corrosion to the connector pins, leading to unreliable operation of the camera unit.

**WARNING!**

To prevent water from penetrating the composite cable connector threads, the 25 mm thread should be sealed at final installation using PTFE tape (not supplied). Alternatively, a suitable sealant may be liberally applied to the thread prior to final tightening.

4.3**Installing the MIC Power Supply Unit (PSU)**

Each MIC power supply unit (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

MIC612 cameras can use the MIC-240PSU-2 power supply (a 230 VAC source) or the MIC-115PSU-2 power supply (a 115 VAC source). The dimensions (H x W x D) of the enclosures are: 90 x 260 x 160 mm (3.54 x 10.24 x 6.3 in.). The weight is 3.2 kg (7.1 lb).

4.3.1**Earth Link on PCB**

The printed circuit board (PCB) 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.

4.3.2**Fuse Ratings**

The MIC PSUs for MIC612 cameras have four (4) off 20 mm fuses (numbers 13 - 16 in *Figure 4.1*) 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
FS 1	MIC camera protection	Glass	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
FS 3	Heater protection 1	Glass	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)

4.3.3

Layout of MIC Power Supply Units (PSUs) for MIC612

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.

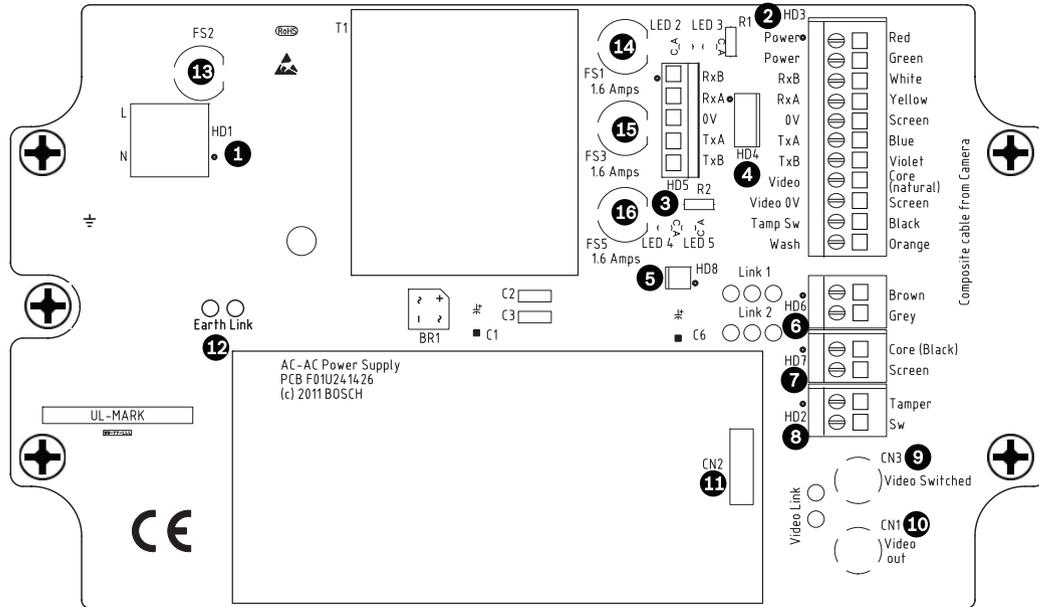


Figure 4.1 Layout of MIC-240PSU-2 and MIC-115PSU-2

Number	Connection / Terminal ID on PCB	Description/Function of Connection / Terminal	Type of Connection / Terminal
1	HD1	AC Power input	Screw terminal
2	HD3	Shielded composite cable (connections to camera)	Screw terminal
3	HD5	RS-485 control	Screw terminal
4	HD4	Telemetry header	Molex connector
5	HD8	USB to RS-485 converter	Molex connector
6	HD6	[Optional] Auxiliary, heater	Screw terminal
7	HD7	Video (composite cable)	Screw terminal
8	HD2	Tamper switch	Screw terminal
9	CN3 (Video Switched)	Coax connection	BNC socket
10	CN1 (Video Out)	Coax connection	BNC socket
11	CN2	Auxiliary card terminal	Plug in
12	Earth Link	Earth Link	--
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	--

4.3.4 Installation Instructions

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 for installation applications **must be** routed through a permanently earthed metal conduit.

**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.

**CAUTION!**

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

**CAUTION!**

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

**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 MIC612 Camera.



To install the power supply, follow these steps:

1. Select the mounting position of the MIC PSU so that it cannot be interfered with either intentionally or accidentally. Bosch recommends using a lockable cabinet.
2. Locate the four (4) mounting holes of the power supply enclosure. (*Figure 4.2* displays one of the holes.) See the dimensional drawing in the appendix for hole locations. The dimensions shown are for the mounting holes only. The other 4 holes shown are for securing the lid and are for reference only.
3. Drill four (4) holes in the mounting surface for the mounting anchors appropriate for M6 screws (not supplied).
4. Loosen the four (4) captive Phillips head screws on the top of the lid of the power supply enclosure (item 2, *Figure 4.2*). 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.

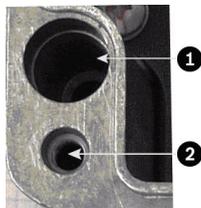


Figure 4.2 Holes for screws for mounting enclosure mounting; holes for screws for enclosure lid

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

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, as shown in *Figure 4.2*.



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 four (4) M3 screws on the internal high voltage input head-end shield (marked with "Danger") covering the mains cable terminal HD1; retain the screws.

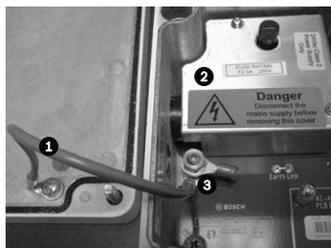


Figure 4.3 Enclosure showing shield and earth core cable between earth terminal post and enclosure lid

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. Install suitable (metal) conduit in place of the blanking plug. 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 need, 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, *Figure 4.4*); set these aside.
12. Remove the ring terminal (supplied).
13. Insert the earth core from the mains cord (item 2, *Figure 4.4*) 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.

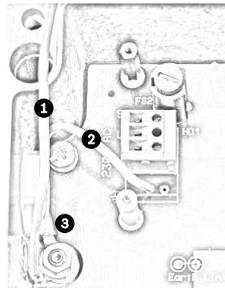


Figure 4.4 Mains input with shield removed, showing terminal block HD1 before wiring

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, *Figure 4.5*).

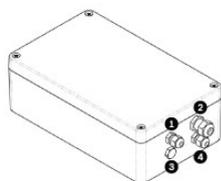


Figure 4.5 MIC PSU Enclosure, with cable glands identified

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.

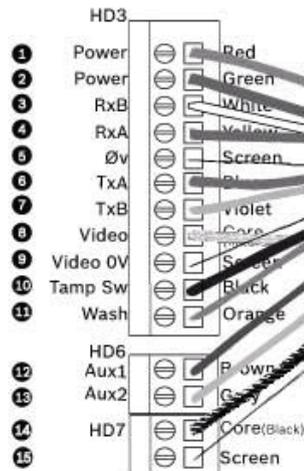


Figure 4.6 Exploded View of Composite Cable Connections

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
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	Core (Black)
15	HD7-2	--	Video Out (Signal Ground)	Screen (Black)

**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 *Figure 4.1* for the location of the screw.

* If connecting a heater, see *Section 4.3.5 Commissioning the Camera with Heater Option Fitted*.

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. Feed the Video Out (coax) cable through the top-left M12 cable gland (item 1, *Figure 4.5*). Crimp the end of the cable with a BNC terminal connector.
23. Connect the Video Out cable to BNC socket CN1.
24. *For dual video output only:* If needed, remove the blanking plug that covers the hole for the bottom-left M12 cable gland (item 3, *Figure 4.5*). 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, *Figure 4.5*).
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
TxA	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-516ALM) or for 8-input alarms plus washer pump drive (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, *Figure 4.5*). 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 converter (MIC-BP4), please refer to their respective manuals.

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

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

4.3.5 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.

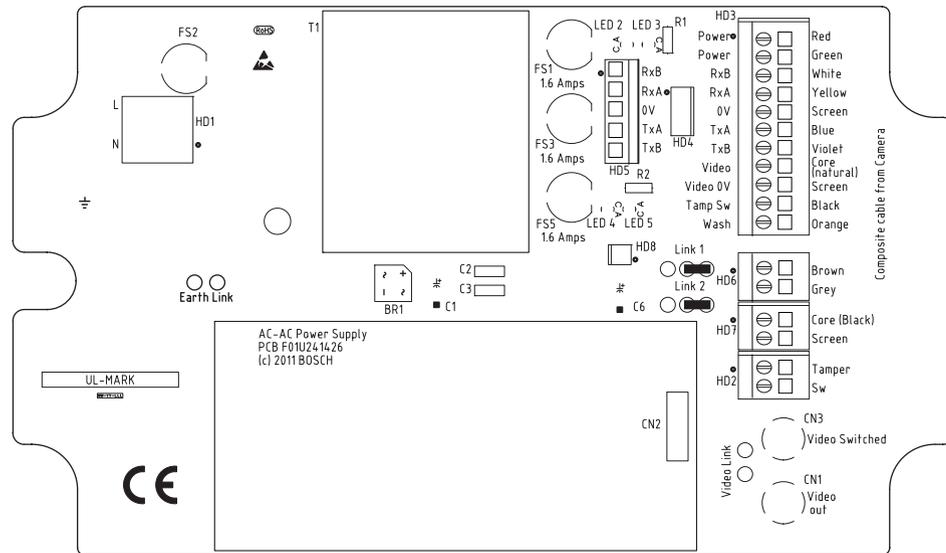


Figure 4.7 PCB links set to 0V

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.

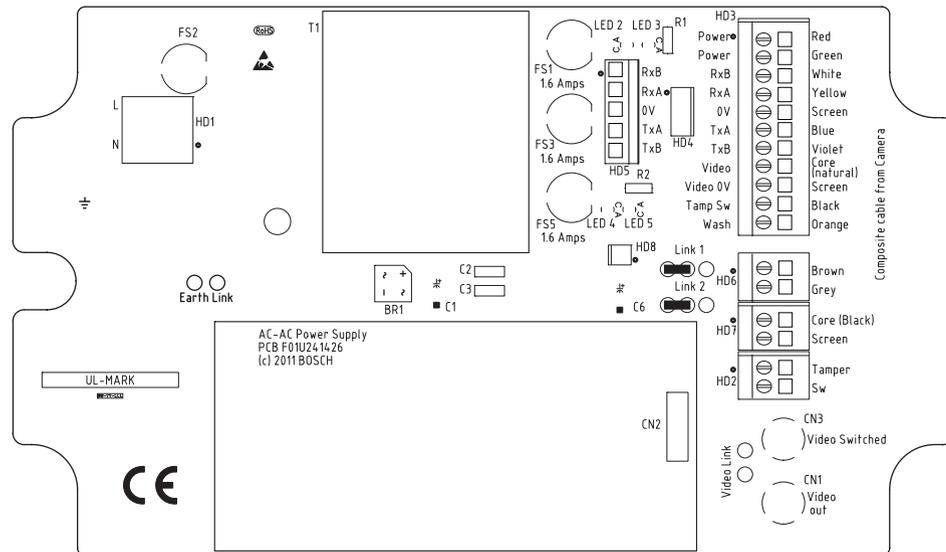


Figure 4.8 PCB links set to 18V

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.

4.4 Fitting the Optional Sunshield (MIC612)

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

To fit the sunshield, follow these steps:



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.

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 stainless steel boss into each screw hole and tighten using a flat head screwdriver.
5. When all four (4) bosses have been fitted, align the holes in the sunshield with the corresponding bosses. Push the sunshield until it fits snugly onto the camera head.
6. Fix the sunshield to the bosses using the M3 stainless steel 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.

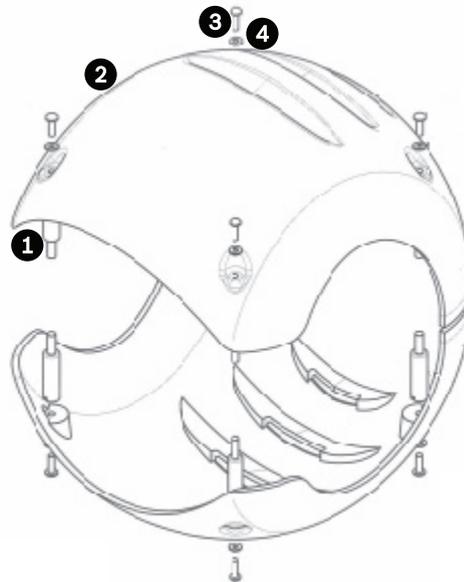


Figure 4.9 Graphical depiction of sunshield assembly

Number	Description
1	Spacer/Stud, 316 SS
2	Sunshield
3	M3 x 10 mm screw, 316 stainless steel (SS), Pozidriv with pan head
4	M3 washer, 316 stainless steel (SS)

5 Getting Started

Install and wire the camera according to the instructions in this manual and in the manuals that accompany the power supply, mounting devices, and optional accessories. 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.

5.1 Establishing Control of the Camera

The MIC612 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.

5.1.1 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). Refer to the Installation Manual of the respective converter for installation details.

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.

5.1.2 Establishing Control of the Camera via RS-485 Protocol

Users can connect: via a) PC -> RS-232 -> RS-232 to RS-485 converter-> MIC612 or
b) PC -> 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 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. Refer to 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).

5.2 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.

5.3 Controlling the Camera

The most common ways to control the MIC612 are:

- Using a keyboard and on-screen display (OSD) menus. This method is the most common. See *Section 5.3.1 Basic Keyboard Operation, page 29*.
- 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).

5.3.1 Basic Keyboard Operation

The following tables summarize the basic operations for a standard keyboard and the functions available to control a MIC612 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 5.1 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 5.2 Typical Keyboard Controls for a MIC612 Camera

5.3.2 Navigating the On-Screen Display (OSD) Menus

The OSD menu 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.

5.3.3 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 *Section A Keyboard Commands (Bosch Protocol) By Number* 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 MIC612 pan 360° continuously is:

ON-1-ENTER (Press the **ON** key, then press the number **1** key, and then press **ENTER**.)

5.3.4 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 MIC612 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	Initiates recording continuous playback based upon current Recording setting (A or B) in the Setup Menu.
	Press and hold	Initiates 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 MIC612 standard preset tour (Tour 1).
4-Pattern	Press	Initiate the MIC612 custom preset tour (Tour 2).
1 – Aux On / Aux Off	Press	Activates / deactivates alarm output 1. This command is supported only if an 8-input alarm card is installed in the PSU powering the camera.
2 – Aux On / Aux Off	Press	Activates / deactivates alarm output 2. This command is supported only if an 8-input alarm card is installed in the PSU powering the camera.
91 – Aux On	Press	Activate Zone Scan (display zone titles).
92 – Aux On	Press	Deactivate Zone Scan (re-move zone titles)

5.3.5

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).
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.
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).
99-PRESET	Starts an AutoScan.



NOTICE!

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

5.4

Setting the Addresses of the Two Cameras of the MIC612

After the 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.



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

5.4.1 Setting the Address of the Optical Camera via FastAddress

The MIC612 offers remote addressing of the optical camera 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!



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.

5.4.2 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.

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.

5.4.3

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 MIC612 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.

5.4.4 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

5.5 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.

5.5.1 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.

5.5.2 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.

5.6 Configuring the Camera for Inverted Operation

The video display from a camera installed in inverted position will appear upside down until you set the video orientation to “Inverted position.” Follow these steps:

1. Access the main Setup Menu of the on-screen display (OSD). The screen **Setup Menu** appears.
2. Select the submenu “PTZ Setup.” The screen **PTZ Setup** appears.
3. Select the option “Orientation.”
4. Select the value “Inverted,” which rotates the video 180°. The video should now appear upright.

6 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 *Section 9 Common User Commands, page 56* and *Section 10 Advanced Features, page 59*.

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.

6.1 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).

6.2 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	AUTO
* 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.

6.3 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.

6.4 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: $-(1^{\circ}/\text{sec. to } 60^{\circ}/\text{sec.})+$.
Default setting: $30^{\circ}/\text{sec.}$

Tour 1 Period

Changes dwell time between presets during the tour. Sliding scale: $-(3 \text{ sec. to } 10 \text{ min.})+$.
Default setting: 5 sec.

Tour 2 Period

Changes dwell time between presets during the tour. Sliding scale: $-(3 \text{ sec. to } 10 \text{ min.})+$.
Default setting: 5 sec.

PTZ Fixed Speed

Sets pan and tilt speed when controlled by a fixed speed controller. Sliding scale: $-(1 \text{ to } 15)+$.
Default setting: 4.

Inactivity

Selects the mode to which a MIC612 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: $-(3 \text{ sec. to } 10 \text{ min.})+$. Default setting: 2 min.

Autopivot

Automatically rotates the camera 180° 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 software rotates the video 180° 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 *Section 10.5 Azimuth, Elevation, and Compass Directions, page 61.*

6.5 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 *Section 10.5 Azimuth, Elevation, and Compass Directions, page 61*.

Compass

Displays compass heading. Options: ON, OFF (default setting). For more details, refer to *Section 10.5 Azimuth, Elevation, and Compass Directions, page 61*.

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 *Section 10.2 Privacy Masking, page 60*.

Edit Sector Title

Allows editing of existing Sector (Zone) Titles. Select a sector title to access the character palette. For instructions, refer to *Section 9.3 Specifying a Shot or a Sector Title, page 56*.

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 *Section 9.3 Specifying a Shot or a Sector Title, page 56*.
- **Clear Scene** to delete the selected scene title.

6.6 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.

6.7 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. See *Section Figure 4.1 Layout of MIC-240PSU-2 and MIC-115PSU-2, page 20* 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	Focus / Iris: Select Type 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 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.

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 1-4

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

Outputs 5-12

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 An 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 *Section 6.7 Alarm Setup, page 43*, 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	Output:
7. Rule 7	Empty	OSD
8. Rule 8	Empty	Shot 2
9. Rule 9	Empty	Alarm Relay 2 sec
10. Rule 10	Empty	NONE
11. Rule 11	Empty	
12. Rule 12	Empty	
Focus / Iris: Select		Right / Left: Select Period Time 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 define 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 (1-99), Shot, OSD, Transmit,** and **NONE** (default setting).

Some outputs, such as **Alarm Outputs 1-3, Alarm Relay,** 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**



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.

6.8

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

6.9 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	

Diagnostic Events

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. If confirmed, the BIST tests start and the results are displayed.

YES to start test.

NO to exit the menu.

Typical results are:

Exit...

BIST

Data Flash: PASS

FPGA: PASS

Bilinx: PASS

Internal Temp.

Displays the current temperature of the camera, in degrees 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 degrees 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 degrees 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.

**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.

Option	Description
Off	(Default setting) No test pattern is available.
Ascending ramp	<p>A test pattern appears in the analog and digital data channels, to allow you verify the output of the digital data channel.</p> <p>The figure below is a horizontal slice of the complete image; the pattern repeats 19 times in the complete image.</p> <p>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.</p>



Figure 6.1 Slice of complete image (320 x 256 or 640 x 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

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. It appears differently, depending on 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 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. Options: **High, Low, Open** (Normally Open), **Closed** (Normally Closed).

Alarm Output

Displays the status of the alarm output.

7 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 *Section 9 Common User Commands, page 56* and *Section 10 Advanced Features, page 59*.

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 MIC612 configuration menu and all MIC612 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 MIC612 memory.



NOTICE!

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

7.1 Bosch Menu

The **Bosch Menu** allows full access to the MIC612 main **Setup Menu** and all MIC612 configuration settings.

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

Refer to *Section 6 On-Screen Display (OSD) Menus (Bosch Protocol)*, page 35 for a complete description of Bosch menus and configuration settings.

7.2 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

7.3 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

7.4**Other Menus**

Menu	Description	Default Setting
Edit Password	Sets or displays the password. See <i>Section 5.5 Setting Passwords, page 34</i> .	
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.	

8 Operation of the Thermal Camera

8.1 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.

8.2 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 8.1 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.

8.3 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!

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.

9 Common User Commands

This chapter details common user commands. See *Section A Keyboard Commands (Bosch Protocol) By Number, page 65*, for a complete list of commands.

9.1 Setting AutoPan Mode

AutoPan mode pans the MIC612 camera 360° or pans between user-defined limits (when programmed). The MIC612 camera continues to pan until stopped by moving the joystick.

To pan 360°:

1. Press **ON-1-ENTER**.
2. Move the joystick to stop the pan.

To set left and right pan limits:

1. Move the camera to the starting position and press **SET-101-ENTER** to set the left limit.
2. Move the camera to the end position and press **SET-102-ENTER** to set the right limit.

To start AutoPan between limits:

1. Press **ON-2-ENTER**.
2. Move the joystick to stop the pan.

9.2 Setting Preset Shots

Preset shots are saved camera positions. Shots are saved as scenes, therefore, the terms **SHOT** and **SCENE** are used interchangeably.

To set a Shot:

1. Move the camera to the position you want to save.
2. Press **SET-#-ENTER**, where # can be a number from 1 to 99 that identifies the camera position of the scene.
3. To specify a title for the shot, see the procedure below.

To view a Shot:

- ▶ Press **SHOT-#-ENTER**, where # is the number of the scene position that you want to view.

To store or clear a Shot:

1. Press **SET-100-ENTER** to access the **Store/Clear Scene Menu**.
2. Follow the on-screen instructions.

To disable overwrite confirmations:

If you overwrite a preset shot, the MIC612 issues a confirmation message prompting you to approve the overwrite. To disable this confirmation message, press **OFF-89-ENTER**.

9.3 Specifying a Shot or a Sector Title

The MIC612 provides an alphanumeric character palette used to specify a title for a shot (scene) or for a sector (zone).

To specify a title:

1. Navigate to the shot or scene:
 - for a shot: set a new shot or view a stored shot, then press **ON-62-ENTER**.
 - for a scene: move the MIC612 to the scene (zone), then press **ON-63-ENTER**.
2. Use the joystick to move the cursor to highlight a character.
3. Press Focus/Iris to select the character.
4. Continue to select characters (up to 20) until you have created the title.

To clear a character from a title:

1. Use the joystick to highlight the **Clear OR Position Character** prompt.
2. Move the joystick left or right until the cursor is below the title character that you need to clear.
3. Press Focus/Iris to clear the character.
4. Move the joystick up to bring the cursor back into the character palette.

To save a title:

1. Use the joystick to highlight the Exit prompt.
2. Press Focus/Iris to save the title.

9.4 Configuring Preposition Tours

A **Preposition Tour** automatically moves the camera through a series of preset or saved shots. The MIC612 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 MIC612 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.

9.5 Programming the Inactivity Operation

You can program the MIC612 to change its operating mode automatically after a period of inactivity.

To access the Inactivity mode (locked command):

1. Press **OFF-90-ENTER** to turn off the command lock.
2. Press **ON-9-ENTER** to access the **Inactivity Mode Menu**.
3. Select one of the following choices:
 - **Return to Scene 1:** Returns the camera position to Shot 1.
 - **Recall Previous Aux:** Returns the camera to the previous operating mode, such as a **Preposition Tour**.

9.6 Recording Tours

The MIC612 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 playback 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 playback Recorded Tour B:

1. Press **ON-52-ENTER** to begin continuous playback.
2. Press **OFF-52-ENTER** or move the joystick to stop playback.

9.7 Using the Wiper/Washer

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:

1. Press ON-105-ENTER, and then confirm this sequence:
2. The wiper moves to a predefined position.
3. The washer turns on for five seconds. Simultaneously, the wiper turns on and wipes five times.
4. 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).
5. The wiper turns off.

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 intermittent wipe:

- ▶ Press **ON-103-ENTER**. The wiper wipes twice, then returns to parked position, and 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 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.



NOTICE!

If the power fails while the wiper is activated, the wiper will return to 'parked' position, after power is restored, before turning off. The wiper will not stop in front of the camera window.

10 Advanced Features

This chapter details advanced user commands, which are more complicated than those in *Section 9 Common User Commands, page 56*.

10.1 Alarm Rules

The MIC612 features 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.

10.1.1 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 MIC612 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 MIC612 receives the disable command. You must acknowledge the alarm before the rule is disabled.
- Prevents the modification of an alarm rule while disabled.

10.1.2 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 MIC612 camera to a saved position. (For this example, Shot 7.)
3. Transmit a Bilinx signal over the coax cable to the headend 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 MIC612. 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:
 - a. From the **Outputs Setup** menu, ensure that Output 5 is set to **OSD** (the default setting for Output 5).
 - b. Set Output 6 to **Shot 7**.
 - c. 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:
 - a. Select **Rule 1**.
 - b. Set the first input to **Alarm Input 1**.
 - c. Set the first output to **OSD**.
 - d. Set the second output to **Shot 7**.
 - e. Set the third output to **Transmit**.
5. Enable the Alarm Rule: Highlight Enabled and select **YES**.

Example 2: Advanced Alarm Rule

Scenario: A MIC612 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 MIC612, 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 MIC612.

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

10.2**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.

**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.

10.3 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.

10.4 Pre-position Tour

The MIC612 features (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.

10.5 Azimuth, Elevation, and Compass Directions

The MIC612 allows a user to display the azimuth and elevation position, and the compass heading of the camera. 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 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)

10.5.1 Setting the Azimuth Zero Point

The installer must calibrate the Azimuth Zero point. 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 MIC612 then displays the azimuth reading and the compass heading based on the number of degrees from the Azimuth Zero point.

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.

**CAUTION!**

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

10.5.2**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 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.

11 Troubleshooting

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).

12 Maintenance

The unit contains no user-serviceable parts. Maintenance and repair of this equipment shall only be carried out by suitably trained personnel in accordance with the applicable code of practice (for example, EN60097-19). In the event of failure, the unit should be removed from site for repair.

To maintain the validity of the certification, only components supplied by Bosch Security Systems shall be used.

12.1 On-site Inspection

It is recommended that the equipment be inspected on-site every six months to check mounting bolts for tightness, security, and any signs of physical damage. Inspection of this equipment shall only be carried out by suitably-trained personnel in accordance with the applicable code of practice (for example, EN60097-17).

12.2 Cleaning and Servicing

- Cleaning** - Unplug the unit from the outlet before cleaning. Follow any instructions provided with the unit. Generally, using a dry cloth for cleaning is sufficient, but a moist fluff-free cloth or leather shammy may also be used. Do not use any of the following on the camera:
 - liquid cleaners
 - aerosol cleaners
 - caustic cleaning products
 - abrasive cleaning products
- Moving** - Disconnect the power before moving the unit. Move the unit with care. Excessive force or shock may damage the unit. For transportation, rotate the ball so that the window points toward the base. This will protect the wiper and the windows during transit.
- Damage requiring service** - Unplug the unit from the main AC power source. Do not attempt to service this unit yourself. Opening or removing covers may expose you to dangerous voltage or other hazards. Refer servicing to qualified service personnel when any damage to the equipment has occurred, such as:
 - the power supply cord or plug is damaged;
 - liquid has been spilled in the equipment;
 - an object has fallen into the unit;
 - unit has been dropped or the unit cabinet is damaged;
 - unit exhibits a distinct change in performance;
 - unit does not operate normally when the user correctly follows the operating instructions.
- Replacement parts** - Ensure that the service technician uses replacement parts specified by the manufacturer, or that have the same characteristics as the original parts. Unauthorized substitutions may cause fire, electrical shock, or other hazards.
- Safety check** - Safety checks should be performed upon completion of service or repairs to the unit to ensure proper operating condition.

A Keyboard Commands (Bosch Protocol) By Number

A.1 Commands, Optical Camera

Locked	Function Key	Command No.	Command	Description
	On/Off	1	Scan 360°	Activates/deactivates Autopan without limits.
	On/Off	2	Autopan	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	35	White Balance Mode	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	Sharpness	Enters the Sharpness menu.
*	On	46	Advanced Menu	Enters the Main Setup menu.
	On	47	View Factory Settings	Displays all menu default settings.
	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	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	Display Adjust	Adjusts the view of the On-screen Display.
	On	62	Pre-position Title menu	Enters the Pre-position Title menu. Refer to <i>Section 9.3 Specifying a Shot or a Sector Title</i> , page 56.

Locked	Function Key	Command No.	Command	Description
*	On	63	Zone Title Menu	Enters the Zone Title menu. Refer to <i>Section 9.3 Specifying a Shot or a Sector Title, page 56.</i>
	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	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.
	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	86	Sector Blanking	Enters the Sector Blanking menu.
*	On/Off	87	Privacy Masking	Enters the Privacy Masking menu.
	On/Off	89	Preposition Confirmation	On—Issues 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	Lens Polarity Menu	On—Reverse Off—Normal
*	On/Off	92	Lens Polarity Menu	On—Reverse Off—Normal
*	On/Off	93	Lens Polarity Menu	On—Reverse Off—Normal
*	On/Off	94	Set Azimuth Zero Point	Sets the zero degree pan position. Refer to <i>Section 10.5 Azimuth, Elevation, and Compass Directions, page 61.</i>
	On/Off	95	Display Azimuth/Elevation Readings	On—Displays azimuth/elevation readings. Off—Hides azimuth/elevation readings. Refer to <i>Section 10.5 Azimuth, Elevation, and Compass Directions, page 61.</i>
	On/Off	96	Display Compass Readings	On—Displays compass heading. Off—Hides compass heading. Refer to <i>Section 10.5 Azimuth, Elevation, and Compass Directions, page 61.</i>
	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	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 MIC612 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.

A.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.
	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.

Locked	Function Key	Command No.	Command	Description
	On/Off	90	Command Lock/Unlock	On–Turns on the lock. Off–Turns off the lock.
	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).
		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 MIC612 units.
	Set	“1-99”	Pre-position Programming	Set ##–Programs a preset view.
	Shot	“1-99”	Pre-position Recall	Shot ##–Recall programmed preset.
	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.
	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.

Glossary

A

Alarm	Event that is configured as an alarm. This is a particular situation (motion detected, doorbell rung, signal lost, etc.) that requires immediate attention. An alarm can include live video, playback video, an action plan, or a map.
-------	--

F

FFC	See Flat-Field Correction.
-----	----------------------------

Flat-Field Correction	An internal mechanism in thermal cameras for improving, periodically, the quality of the image.
-----------------------	---

Focal Plane Array	A Focal Plane Array (FPA) is an array of light-sensing pixels (also called detector elements) at the focal plane of the camera lens. Generically, the FPA is also called the detector array or the sensor array.
-------------------	--

FPA	See Focal Plane Array.
-----	------------------------

P

PCD	Acronym for pitch(ed) circle diameter.
-----	--

Pitch(ed) circle diameter	The type of 'foot' on the MIC612 that has bolt holes for mounting the MIC612 to the bowl of a MIC-WMB (wall mount bracket) or to a MIC-DCA (deep conduit adapter) or MIC-SCA (shallow conduit adapter).
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