MIC inteox 7100i

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1 Safety

1.1 About this Manual

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

1.2 Legal Information

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Trademarks

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

1.3   Safety Precautions

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

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

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

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

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

1.4   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 and **Canada**

Telephone: 800-289-0096, option 5

Fax: 800-366-1329

Email: repair@us.bosch.com

Customer Service

Telephone: 800-289-0096, option 3

Fax: 800-315-0470

Email: orders@us.bosch.com

Technical Support

Telephone: 800-289-0096, option 4

Fax: 800-315-0470

Email: technical.support@us.bosch.com

Europe, Middle East, Africa, and Asia Pacific Regions

Contact your local distributor or Bosch sales office. Use this link: https://www.boschsecurity.com/xc/en/where-to-buy/

More Information

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

2   Introduction

–   This equipment should be unpacked and handled with care. Check the exterior of the packaging for visible damage. If an item appears to have been damaged in shipment, notify the shipper immediately.
–   Verify that all the parts listed in the Parts List below are included. If any items are missing, notify your Sales or Customer Service Representative from Bosch Security Systems.
–   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 (if undamaged) is the safest container in which to transport the unit and must be used if returning the unit for service. Save it for possible future use.

Caution!
Take extra care lifting or moving MIC cameras because of their weight.

The MIC packaging is designed:
–   to allow installers to configure the camera inside the shipping box.
–   to provide a temporary table-top or desk-top stand.

2.1   Parts List - Camera

Quantity	Component
1	MIC inteox 7100i camera
1	spanner tool [to remove and to attach the yoke caps in order to cant the camera if desired, and to remove the access plug from the camera head when installing the optional illuminator accessory (sold separately)]
1	base gasket
1	RJ45 coupler
1	MAC address labels
1	Quick Installation Guide
1	Safety instructions

2.2   Additional Products Required

Quantity	Item
100 m maximum	Ethernet cable (Cat5e or better)
*	Power cable (24 VAC)
*	Alarm wiring as needed
*	Audio wiring as needed
1	microSD card (maximum 32 GB (microSDHC) / 2 TB (microSDXC)) (user-supplied)

* Refer to the chapter Preparing Wiring.

2.3   Additional Tools

2.4   Establishing the connection

The unit must have a valid IP address to operate on your network and a compatible subnet mask.

By default, DHCP is pre-set at the factory to **On plus Link-Local** so a DHCP server assigns an IP address or, if no DHCP server is available, a link-local address (auto-IP) is assigned within the range 169.254.1.0 to 169.254.254.255.

You can use the Configuration Manager to find the IP address. Download the software from http://downloadstore.boschsecurity.com.

1.   Start the Web browser.
2.   Enter the IP address of the unit as the URL.
3.   During initial installation, confirm any security questions that appear.

Note:

If you cannot connect, the unit may have reached its maximum number of connections. Depending on the device and network configuration, each unit can have up to 50 web browser connections, or up to 100 connections via Bosch Video Client or BVMS.

2.5   Configuration with Project Assistant app

You can also use the Project Assistant app to complete the initial configuration of the camera. In order to use this device with the Project Assistant app by Bosch, you must download the app from the Bosch Download Store, from Google Play, or from the Apple Store.

You can access the app in several ways:

–   Scan the QR code from the QIG.
–   From www.boschsecurity.com, select Support > Apps and Tools > Online Apps - Video > Bosch Project Assistant app. Select the appropriate operating system, and then click the appropriate button to download and install the app.
–   From Google Play Store (play.google.com), search for Bosch Project Assistant. Select the app from the list. Click the Install button.
–   From Apple Store (itunes.apple.com), search for Bosch Project Assistant. Select the app from the list. Click the appropriate button to download and install the app.

3 Product Description

The camera's ruggedized design meets customer expectations in demanding environments that exceed the capabilities of conventional IP cameras. Even in installations subject to harsh shock/vibration conditions and/or extreme weather, the camera provides high-quality video images.

– Make sure that the installation conditions comply with the specified stresses of vibration and shock as mentioned in the datasheet.

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

4   Overview of Installation Steps

⚠	**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 accepts no liability for any damages or losses caused by incorrect or improper installation.

⚠	**Caution!** ELECTRIC SHOCK HAZARD To reduce the risk of electric shock, disconnect power to the camera and/or to the power supply unit before moving the camera, before installing any accessories, and before mounting the camera.

Before you install your MIC camera, inspect the camera for any scratches or damage to the surface finish/paint. If you notice damage to the paint, return the unit for a replacement.

1. Select the Mounting Location and Orientation.

2. Install the appropriate 24 VAC power supply (VG4-A-PSU1 or VG4-A-PSU2) or midspan (60 W version or 95 W version). If you use the illuminator accessory, you must use the 95W version.

Refer to the Installation Manual of the appropriate device for installation instructions.

3. Install grounded metal conduit (user-supplied) to the MIC DCA (sold separately) (and to the PSU if necessary), install wiring (user-supplied), and then make the necessary connections for power, telemetry, and video.

4. (Optional) Install an SD card (if your camera model supports this feature).

5. (Optional) Complete pre-configuration in the shipping box or on a table.

If installing the camera in inverted orientation, complete this step on a table-top stand only.

6. Install the DCA and then install the camera on the DCA.

OR

6. Install the camera directly to a mounting surface (such as an eave).

7. (Optional) Install the sunshield (sold separately).

8. (Optional) Install the illuminator (sold separately).

9. (Optional) Cant the camera.

10. Make the appropriate power and control connections.

5 Mounting

5.1 Mounting Location and Orientation Options

Bosch designed MIC IP 7100i cameras for use in outdoor applications. In an enclosed installation area (for example, in a foundry, near a furnace, etc.), temperatures outside of the camera might exceed +65 °C (+149 °F). If you install a camera in an enclosed area, make sure that the operating temperature of the camera is a maximum of +60 °C (+140 °F). Make sure that air circulates around the camera to supply cooling.

MIC cameras are designed for easy installation in various locations such as directly onto buildings and poles suitable to support CCTV equipment.

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

Select a location where the MIC camera will not touch materials such as steel straps or cables. You can install the camera:

– onto a MIC-DCA or a MIC wall mount (MIC-WMB) with a MIC shallow conduit adapter (MIC-SCA). (Never install the wall mount only.)
  or
– directly to a mounting surface using the supplied base gasket and the appropriate connector kit (sold separately):
  – MIC-9K-IP67-5PK (IP67 Connector kit for MIC IP fusion 9000i, MIC IP ultra 7100i, and MIC IP starlight 7100i cameras)

To have an installation rated IP67, you must use the appropriate IP67 Connector Kit from Bosch.

Confirm that no residual water or moisture is in the bottom of camera. Ground the camera as described in the chapter "Installing a MIC Camera on a Hinged DCA."

You can install the camera in one of three orientations:

– upright (straight up, 90°)
– inverted (straight down, 90°)
– canted upright (tilted forward 35°)

The most common type of mounting location is the top of a pole suitable to support CCTV equipment and that provides a robust mounting platform to minimize camera motion and typically has a large base cabinet for mounting ancillary equipment such as power supplies. Other locations for mounting the camera include the top of a building, the side (wall) of a building, the corner of a building, and under the eave of a building.

The camera can also be mounted on the side of a lamp post, pole, or similar column using the Pole Mount Bracket (MIC-PMB). Be aware that lamp posts can often be subject to movement and are not suitable platforms in all conditions or for all applications.

ⓘ	**Notice!** Outdoor installation For details about the proper configuration for installing your camera outdoors with surge and lightning protection, refer to *Best Practices for Outdoor Installation, page 46*.

Ensure that the 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 device near:

– Any heat sources
– Any overhead power lines, power circuits, or electrical lights, or where the device may contact power lines, circuits, or lights

Isolate shielded CAT5e or CAT6 cable from any high voltage power lines in a separate grounded, metal conduit. Refer to the datasheet for test conditions for allowable transients / voltage fluctuations.

Mounting surface recommendations for MIC mounting accessories
The mounting surface should be capable of supporting the combined weight of the MIC camera + MIC Illuminator + MIC mounting accessory (DCA, wall mount, corner bracket, etc.). All expected conditions of load, vibration and temperature should be considered when planning an installation. The material should accommodate a minimum pull-out strength of 275 kg (600 lb).
The mounting accessory should be secured to one of the following surfaces:
–   Concrete (solid / cast)
–   Concrete masonry unit (concrete block)
–   Brick (all types)
–   Metal (steel / aluminum, minimum 3 mm (0.125 in.) thick)
In all situations, Bosch recommends referencing any applicable building codes or professional structural engineering guidelines for a secure installation.
▸   Ensure that the selected mounting surface is capable of supporting the combined weight of the camera and mounting hardware (sold separately) under all expected conditions of load, vibration, wind, and temperature.

Caution!
Risk of lightning strikes
If the camera is installed in a highly exposed location where lightning strikes may occur, then Bosch recommends installing a separate lightning conductor within 0.5 m (1.6 ft) of the camera and at least 1.5 m (4.9 ft) higher than the camera. A good earth bonding connection to the camera housing itself will provide protection against damage from secondary strikes. The camera housing itself is constructed to cope with secondary strikes. If the correct lightning protection is applied, then no damage to the internal electronics or camera should result.

Installation in a damp environment (for example, near a coastline)
The fasteners and fixtures shipped with the camera help to keep the camera secure. Always use Bosch-supplied screws and other fasteners when installing or performing maintenance on the camera. Bosch-supplied hardware is properly treated and engineered for safe use with your MIC camera.
The camera head has three (3) plastic screws, factory-installed, around each IR port to prevent corrosion in units that do not have accessories installed on the camera head. If you install a sunshield or an illuminator accessory, you must remove the plastic screws and replace them with the metal screws that ship with each accessory.
Before installation, and periodically, inspect the metal parts of the camera for paint that is chipped or otherwise damaged. If you notice any paint damage, return the unit for a replacement.
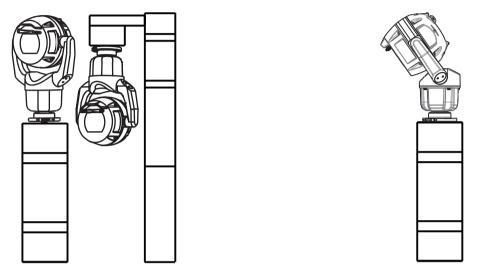Avoid installation practices that may bring the camera's metal mountings in contact with materials such as stainless steel. Such contacts can result in galvanic corrosion and degrade the cosmetic appearance of the camera. These cosmetic damages caused by improper installation are not covered by warranty as they do not affect the functionality of the camera.

5.2   Mounting Options

See the figures that follow for illustrations of the correct and the incorrect mounting orientations of MIC cameras.

MIC cameras are designed to be mounted upright (straight up, 90°), inverted (straight down, 90°), or canted upright (ball up, 35°). The tilt limits for the canted unit prevent it from working properly if mounted ball down. See the figures below for illustrations of the correct and the incorrect mounting orientations of MIC cameras.

Correct mounting orientation - upright, inverted
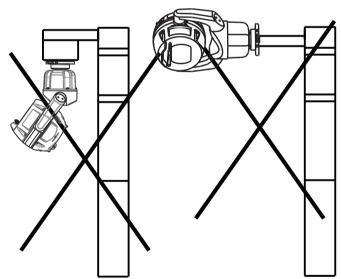
Correct mounting orientation - canted

Figure 5.1: Incorrect/not permitted mounting orientations (inverted + canted, horizontal)

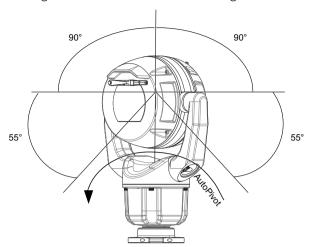The figure below illustrates the tilt range of the camera in upright orientation.

Figure 5.2: Tilt range, MIC IP ultra 7100i

5.3   Mounting Bracket Options

Bosch sells a complete series of mounting brackets that support multiple mounting configurations.

Always use only Bosch-supplied mounts, which are designed for safe installation of your MIC camera.

Refer to the MIC Series Mounting Brackets Installation Guide for complete installation instructions.

Mounting hardware recommendations for MIC mounting accessories

Fasteners are not supplied with the MIC mounting accessories for attachment to the mounting surface. The type of fastener necessary is dependent on the mounting surface.

Fasteners can include wedge anchors, sleeve anchors, single expansion anchors, double expansion anchors, machine screws or 'Thru-Bolting' with a nut.

Fasteners are to be of a structural grade (ISO Class 10.9, SAE Grade 8) and zinc plated for moderate corrosion resistance. When installed in marine or similarly corrosive environments, stainless hardware (A2-800, A4-800) is recommended.

Fasteners are to be a minimum diameter of 8 mm (0.3125 in.).

All bolts must extend through the mounting surface and be secured with a flat washer, lock washer and nut. All studs must be anchored to concrete or welded to a steel backing plate.

In all situations, Bosch recommends referencing any applicable building codes or professional structural engineering guidelines for a secure installation.

Deep Conduit Adapter

The hinged DCA is well-suited to installations on top of a pole.
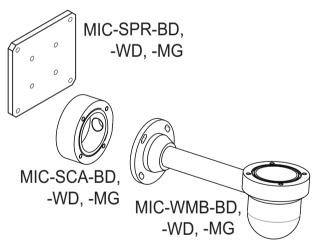
Wall Mount

Figure 5.3: Typical Wall mount configuration

Note: Always install an SCA when you install a wall mount for any installation configuration. Route cables through the bottom of the SCA (to prevent water from running into the side or top of the SCA along the cables).

Pole Mount

The figure below identifies the three mounting accessories (each sold separately) that are necessary to mount the MIC camera on the side of a pole.

Note: The figure identifies the part numbers, as well as the codes for the available colors (-BD for black, -WD for white, and -MG for grey) of each mounting accessory.
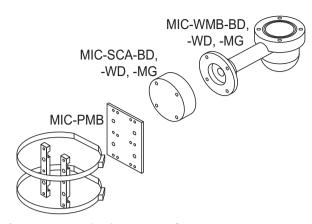
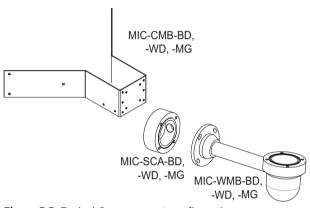**Figure 5.4:** Typical Pole mount configuration

Corner Mount

Figure 5.5: Typical Corner mount configuration

Note: Always install an SCA when you install a wall mount for any installation configuration. Route cables through the bottom of the SCA (to prevent water from running into the side or top of the SCA along the cables).

5.4   Considerations for Mounting the Camera in Inverted Orientation

To change the camera orientation to "Inverted," complete the following steps:
1. Remove the camera from the shipping box.
2. Apply power to the camera.
3. Access the web browser of the camera.
4. Access the page Configuration.
5. Navigate to Camera > Installer Menu > Orientation.
6. Select "Inverted."
   The camera head will rotate automatically into inverted position (180°).

Note the position of the visor when the camera is installed in inverted orientation. The visor will now be near the body of the camera.
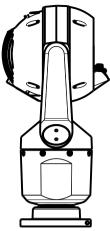
Figure 5.6: MIC camera with camera head inverted

Note: It is not necessary to remove the section for the illuminator on the sunshield because the illuminator is attached to the opposite side of the camera visor.

Seal the mount so that moisture or water cannot collect and stay in the bottom of the MIC camera.

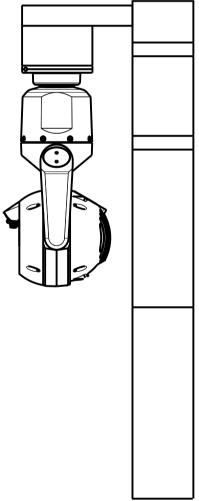The figure that follows shows the camera installed in inverted orientation on a pole.

Figure 5.7: MIC camera mounted in inverted orientation (on pole)
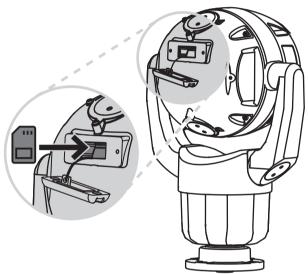
6   (Optional) Installing an SD card

The steps that follow are applicable for MIC enhanced models (MIC-7504-Z12xR, MIC-7522-Z30xR).

1. Use a T20 Torx driver to remove the two (2) fasteners from the SD card cover on the rear of the camera head.
2. Pull off the SD card cover. Allow the cover and the O-ring seal to hang loose from the tether.
    Note: Do not drop the fasteners.
3. Install a standard SD card.

4. If necessary, put the O-ring seal into the cover.
5. Put on the cover.
6. Install the two (2) fasteners that you removed in step 1.
7. Tighten the fasteners to 1.8 N m (1.3 ft lb).

7   (Optional) Configuration Programming in the Shipping Box

The camera packaging allows installers to connect the camera to the network and configure the camera still in the box.

⚠	**Caution!** Risk of damage to camera Do not change the camera orientation to "Inverted" while the camera is still in the box. The camera head must be free to rotate. If you must change the camera's orientation to "Inverted," remove the camera from the box and configure it by following the steps in (Optional) Configuration Programming on a Temporary Table-top Stand.

1. Remove the packing material to access the camera's electrical connectors.
2. Supply power to the camera and Connect the camera to the computer. Note that the wiper moves one to three times across the camera window, and then returns to parked position.
3. Configure the camera. Refer to the separate User Manual for details.
4. Disconnect the wires/cables from the connectors in the base of the camera.

Refer to

8   (Optional) Configuration Programming on a Temporary Table-top Stand

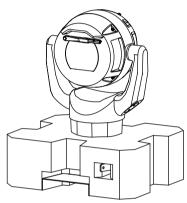|	**Caution!**
⚠	Take extra care lifting or moving MIC cameras because of their weight.

The camera (still in the foam) can stand temporarily on a flat, horizontal surface such as a desk or a table during initial network connection and configuration.

1. Remove the packing material to access the camera's electrical connectors.

1.   Remove the foam covering the head of the camera.

3. Remove the camera, still in the foam, from the box. Place the camera upright on a flat, horizontal surface.

1.   Supply power to the camera and Connect the camera to the computer. Note that the wiper moves one to three times across the camera window, and then returns to parked position.
2.   Configure the camera. Refer to the separate User Manual for details.

	Notice!
ⓘ	If you change the camera orientation to "**Inverted**" (from the page **Configuration** of the web browser: **Camera** > **Installer Menu** > **Orientation**), then the camera head will rotate automatically into inverted position (180°). Note that the visor will now be near the body of the camera.

3.   Disconnect the wires/cables from the connectors in the base of the camera.

9   Installing a MIC Camera on a Hinged DCA

The hinge feature allows installers to "hang" the camera temporarily but securely during installation for easier connection of cables/wiring before final bolts are installed.

Parts List

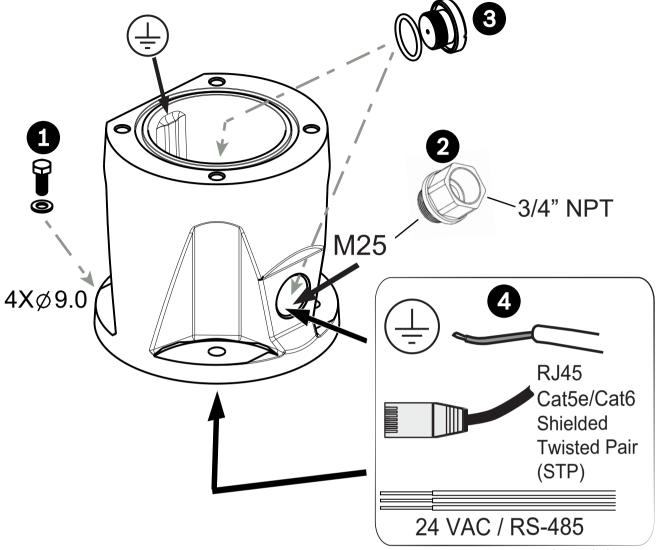| Quantity	Component
1	MIC Hinged DCA (MIC-DCA-Hx)
4	Stainless steel hex bolts, M8 x 30
4	Stainless steel plain washers, M8
1	O-ring, 80 mm x 3 mm
1	conduit adapter (male M25 to female 3/4" NPT) (Available in specific regions only.)
1	Blanking plug, M25 x 1.5, with O-ring
1	Quick Installation Guide

Additional Tools Required

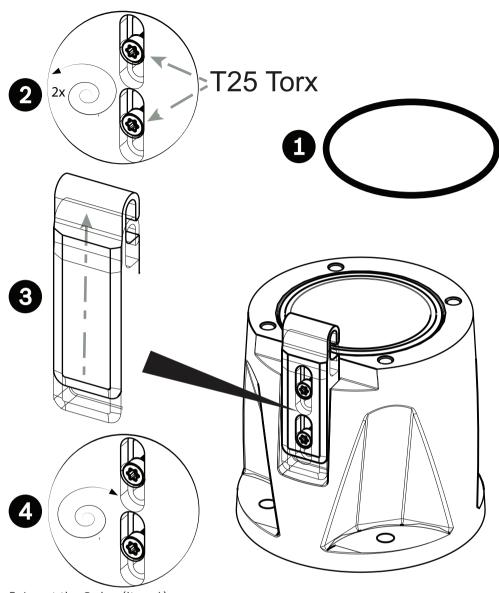|	
1	Torx driver, T25, to loosen and tighten the hook bolts
1	Wrench/driver to secure M8 bolts (supplied) to mount the camera onto the DCA
1	Wrench/driver to secure user-supplied bolts (maximum M8 or 5/16" diameter) to mount the DCA to the mounting location
1	Phillips-head screwdriver to attach ground wire
*	* (Optional) MOLYKOTE® 111 grease [from Dow Corning] for primary O-ring

> ⚠ **Warning!**
> Ensure not to damage the paint on the housing of the camera or the mount.

4X∅9.0

M25

3/4" NPT

RJ45
Cat5e/Cat6
Shielded
Twisted Pair
(STP)

24 VAC / RS-485
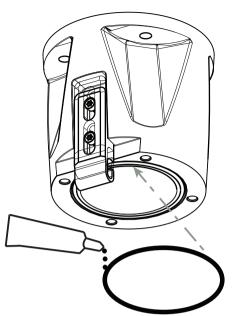
1. Attach the DCA to the mounting location using user-supplied hardware (item 1). (Bosch recommends stainless steel bolts and washers.)

2. Attach user-supplied conduit or glands to the side hole or to the bottom hole. If applicable, use the conduit adapter (male M25 to female ¾ in. NPT) (item 2, included with the DCA).

3. Route cables into the DCA (item 4), either through the bottom or from the side.

4. Use the blanking plug and O-ring (item 3, included with the DCA) to close the unused hole (bottom or side) in the DCA.

T25 Torx
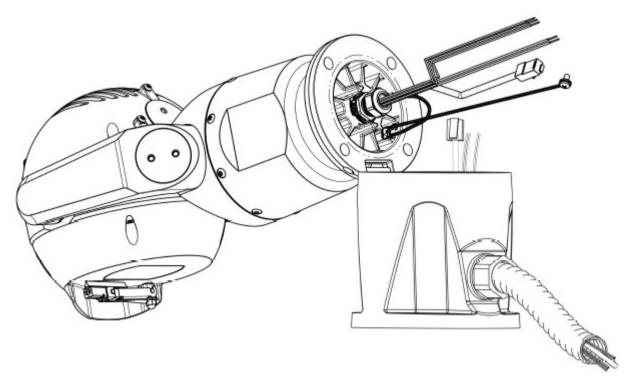
5. Insert the O-ring (item 1).

6. Loosen the Torx bolts two (2) turns (items 2). Slide the hook up (item 3). Tighten the bolts to hold the hook in place temporarily (item 4).

7. For inverted installation, apply a small amount of grease to the primary O-ring to hold it in place.

8. Push the wires from the camera base into the DCA while positioning the base pin of the camera under the DCA hook (item 1). Avoid pinching the wires! (item 2). Loosen the hook bolts, and then slide the hook down to secure the camera pin. Fully tighten the hook bolts (item 3).
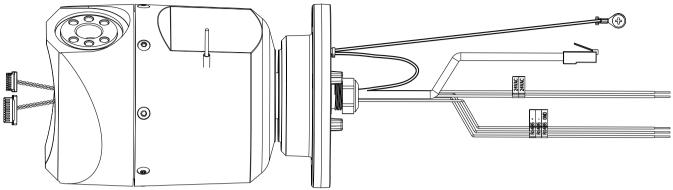
9. Carefully tilt the camera to the side with the pin under the hook.
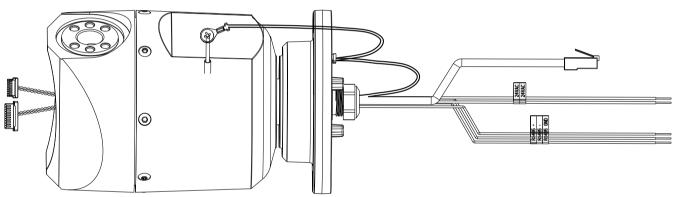
	Notice!
$\mathbf{i}$	Risk of damage to the camera!
	Ease the camera into position; do not allow it to fall unassisted into rotated position or allow head to slam into any surface or object!
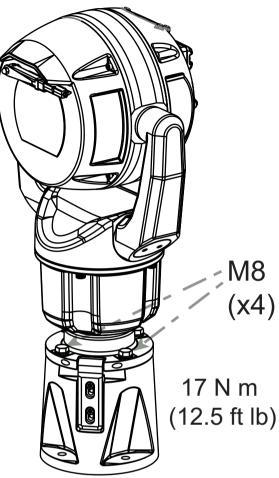
10. Make the appropriate electrical connections. Refer to the chapter **Connections** for more information.

11. Connect the lead from the camera pigtail to the ground post on the pan base. The connection for the customer should be to the lead from the post.

M8
(x4)

17 N m
(12.5 ft lb)

12. Carefully tip the camera to its final position. Avoid pinching wires between the camera base and the DCA! Insert four washers and hex bolts (supplied).

10 (Optional) Installing a Sunshield

Quantity	Component
1	Sunshield shell
2	Screws, M4 x 10
2	Flat washers
1	Quick Installation Guide

Additional Tools Required
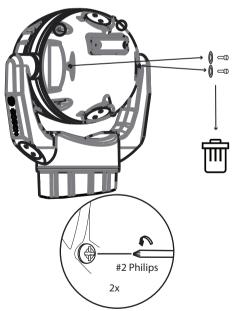
1	Phillips-head screwdriver, #2, to remove factory-installed plastic screws from the camera head
1	Torx driver, T20, for M4 Torx head screws
1	Pair of diagonal cutters, to remove the plastic insert for the illuminator from the sunshield shell, if necessary
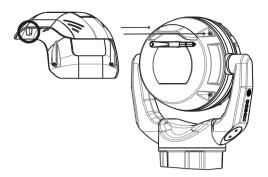
> **Notice!**
> Install the applicable accessories (illuminator, sunshield) before you cant the camera.
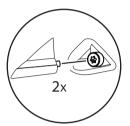
1. If you will install an illuminator on a unit mounted in upright orientation:
   Cut out the inset area in the sunshield shell with a pair of diagonal cutters. The inset area provides space to attach the illuminator. Discard the cut-out plastic.
   Note: This step does not apply to cameras mounted in inverted orientation.
2. Remove the screws from the camera head.

#2 Philips

2x
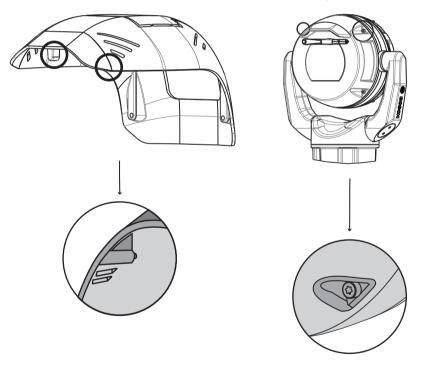
3. Attach the sunshield to the camera head.
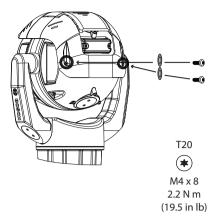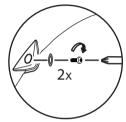
4.   Make sure that the tabs in the sunshield lock into place in the camera head.

5.   Install the M4 x 10 screws. Tighten the screws to 2.2 N m (19.5 in-lb).

T20

⊛

M4 x 8
2.2 N m
(19.5 in lb)

2x

6. Note that when you install the sunshield correctly, the sunshield appears as in the following figure.
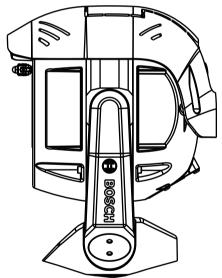
Figure 10.1: Sunshield installation is complete.

11   (Optional) Installing the Illuminator

Use the correct set of tools as well as the recommended torque values given in the instructions that follow. The use of the wrong tools or torque values may cause damage to threads or seal caps, which may result in leaks or damage to paint, which then may lead to the start of corrosion.

Parts List

| Quantity	Component
1	MIC Illuminator accessory
1	Spanner wrench [to remove the access plug from the camera head]
3	M4x10 socket head Torx screws
1	Quick Installation Guide

Additional Tools Required

> **Warning!**
> IR emitted from this product.
> Meets IEC 62471, Risk Group 1.

> **Notice!**
> This product has been tested according to standard IEC62471:2006 "Photobiological safety of lamps and lamp systems". The product emissions exceed the EXEMPT Group limit for both Retinal Blue Light and Cornea/Lens infrared hazard as defined by IEC 62471:2006. The product was found to meet the Risk Group 1 exposure limits for IR and White LEDs.

Refer to the MIC7000 Operation Manual for complete information on illumination safety.

> **Notice!**
> If the MIC camera will have both illuminator and sunshield accessories, install the illuminator first.

1. Mount the camera or stand it temporarily in the packaging foam on a stable surface before proceeding. (Refer to the Operation Manual.)
If the camera will be mounted inverted, you must rotate the tilt head before attaching the illuminator.
1.   Apply power.
2.   Connect to your network.
3.   From the web browser, access the camera's Configuration page. Select Camera > Installer Menu > Orientation.
4.   Select "Inverted". Click **Set** to confirm the selection. The camera head will rotate automatically into inverted position (180°).
Regardless of mounting orientation, the visor should always be above the camera window.
2. Remove and discard the three (3) plastic screws **surrounding the appropriate access port where the illuminator will be installed**.
3. Remove the appropriate access plug from the camera head with the supplied spanner wrench. For upright cameras, remove the plug near the visor. For inverted cameras, remove the plug farther away from the visor.
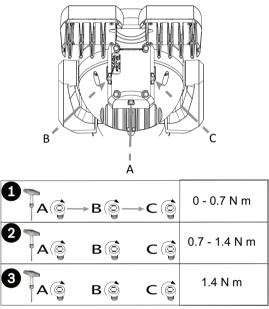
Bosch suggests storing the access plug inside the DCA mount (or wall mount accessory) in case it becomes necessary to remove the illuminator.

4. Remove the plastic cap from the illuminator accessory. Discard.

5. Align the illuminator over the access port and carefully push into position on the camera head.

❶ A → B → C	0 - 0.7 N m
❷ A B C	0.7 - 1.4 N m
❸ A B C	1.4 N m
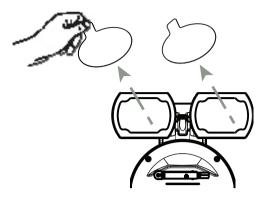
6. Partially engage the threads of all three (3) screws. Do not tighten any one screw completely at this point.

–   Using the T20 Torx driver, tighten the screws to the proper torque using the sequence described in the previous figure.
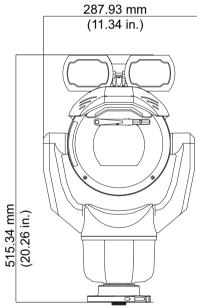
⚠ **Warning!**
Total engagement is not complete until you tighten all three (3) screws.

---

7. Remove the translucent film.

8. Installation of the illuminator is complete.

12 (Optional) Canting the Camera

Note:

For simplicity, the graphics in this section are only of the camera (and the specific accessory that you are installing, if applicable). The graphics do not depict other accessories that you may have installed already.

MIC inteox 7100i cameras have on-site canting functionality.

Installers can adjust the camera from an upright position to a canted position (35º angle) if necessary. In this position, the field of view (FOV) of the camera includes the scene directly beneath the camera.

When you select the mounting location for the camera, make sure that the location gives the necessary clearance for the camera head to pan.

Installation	Clearance radius required
Camera only	200 mm (7.9 in.)
Camera + illuminator	280 mm (11 in.)

You cannot install a canted unit in inverted orientation (with the camera head down). The tilt limits of the camera prevent correct operation in inverted and canted orientation.

⚠️ **Warning!**

Risk of bodily injury.

Unplug the device from its power source before canting the device. After removing the screws from the yoke arms, support the camera head so that it doesn't tilt downward unexpectedly and pinch fingers or other body parts.

ⓘ **Notice!**

Risk of damage to the camera

Do not, under any circumstances, cant the camera while the camera is on its side. Cant the camera from an upright position only, in order to prevent screws or other objects from falling into the open spaces in the arms when the yoke caps are removed.
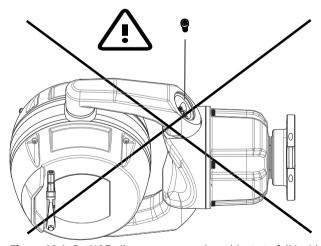

Figure 12.1: Do NOT allow screws or other objects to fall inside the camera.

⚠️ **Warning!**

Risk of bodily injury

Do not put a canted (35°) camera in an upright position on the camera base or on an unsecured DCA. In this position, the camera can fall over and can cause injury or be damaged. Put the canted camera on its side until installation.

Notice!
Install the applicable accessories (illuminator, sunshield) before you cant the camera.

Use the correct set of tools as well as the recommended torque values given in the instructions that follow. The use of the wrong tools or torque values may cause damage to threads or seal caps, which may result in leaks or damage to paint, which then may lead to the start of corrosion.

To cant the camera, follow these steps:

1. Install the camera on a DCA. Mount the DCA.
2. Remove the yoke cap (item 2 in the figure below) on one yoke arm of the camera, using the supplied spanner wrench (item 1).

Repeat for the second arm.
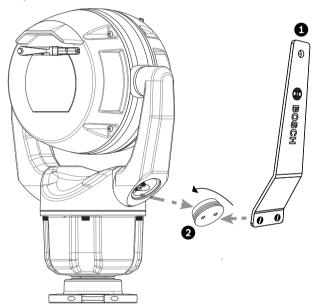
Figure 12.2: Remove the yoke caps with the spanner tool.

1. Remove the two (2) screws at the bottom of one yoke arm using a wrench (user-supplied) as described below.

Notice!
Risk of damage to the device.
Without the yoke arm screws in position, the camera head can fall and be damaged. Hold the head of the camera as you complete the next four (4) steps.

3. Put the screws in a safe place. You will reinstall the screws at step 6.

4. Repeat steps 2 and 3 for the second yoke arm.

5. Rotate the arms and the head assembly forward.

Notice!
Risk of damage to the device.
Do not cant the camera, or let it fall, in the wrong direction. The camera should cant only in the direction indicated in the figure directly below.
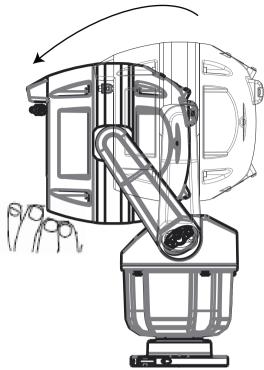
Figure 12.3: Cant the camera head.

6. Reinsert the screws into both yoke arms. As you tighten the bolts, carefully push the camera head up about 2 mm (0.08 in.), against gravity, towards the center of the camera (as in the arrow in the figure that follows). This action removes the slack in the arms and aligns the screw holes properly so that the camera head can move freely.
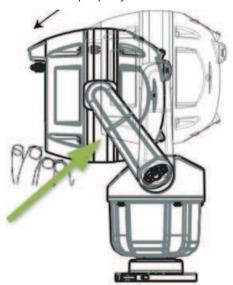
Figure 12.4: Push camera head up 2 mm (0.08 in.)
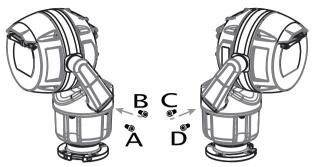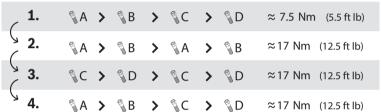
Figure 12.5: Reinsert the screws in the yoke arms in the following sequence: ABCD.

7. Using a torque wrench (user-supplied), tighten the screws to the proper torque using the sequence described in the table below.

8. Recheck all four screws to ensure the proper torque value.

Do not use grease on the screws.

5mm Hex
(T30 Torx)

1.	A	>	B	>	C	>	D	≈ 7.5 Nm (5.5 ft lb)
2.	A	>	B	>	A	>	B	≈ 17 Nm (12.5 ft lb)
3.	C	>	D	>	C	>	D	≈ 17 Nm (12.5 ft lb)
4.	A	>	B	>	C	>	D	≈ 17 Nm (12.5 ft lb)

9. Attach the yoke caps using the supplied spanner wrench.

Figure 12.6: Attach the yoke caps.

10. Canting is complete.
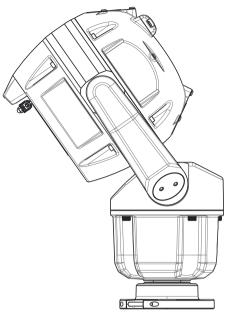
Figure 12.7: Canting is complete.

11. Change the camera orientation to "Canted." Complete the following steps:

–   Access the page Configuration.

–   Navigate to Camera > Installer Menu > Orientation.

–   Select "Canted."

13   Connection

13.1   About Camera Power and Control

The camera incorporates a network video server that encodes video images and PTZ control commands for transmission over a TCP/IP or UDP/IP network.

With its H.264 or H.265 encoding, it is ideally suited for IP communication and for remote access to digital video recorders and multiplexers. Use existing networks to achieve quick and easy integration with CCTV systems or local networks. Several receivers can receive video images simultaneously from a single camera.

13.2   Power Source Options

The camera can be powered by a network compliant to High Power-over-Ethernet using a Bosch model of High PoE Midspan (sold separately). With this configuration, only a single cable connection
(Cat5e/Cat6 Shielded Twisted Pair (STP)) is needed to view, to power, and to control the camera.

For maximum reliability, the camera can be connected simultaneously to a High PoE Midspan and a separate 24 VAC power source. If High PoE and 24 VAC are applied simultaneously, th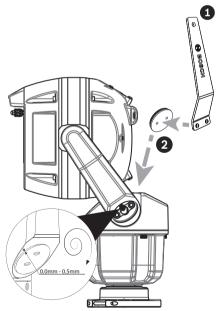e camera usually selects the High PoE Midspan and will draw minimal power from the auxiliary input (24 VAC). If the High PoE Midspan power source fails, the camera switches power input seamlessly to 24 VAC. After the High PoE Midspan power source is restored, the camera switches power input again to the High PoE Midspan.

Bosch recommends 24VAC power output of 24V at 100VA, 4A with a slow blow fuse.

The power supply must be certified to UL/IEC 60950-1 2nd Edition, AM1+AM2 or UL/IEC 62368-1 2nd Ed, Output 24 VAC, LPS, +65 °C (+149 °F) min.

Camera models	60 W midspan	95 W midspan	24 VAC PSU*
Models with illuminator		X	X
Models without illuminator	X	X	X
* recommended: 24V at 100VA, 4A with a slow blow fuse			

Bosch recommends only a midspan power source for models with an attached illuminator. The table below identifies the power devices that can be connected simultaneously to the camera.

If power is supplied from:	Camera can receive power simultaneously from:
60 W midspan	24 VAC PSU: VG4-A-PSU1 or VG4-A-PSU2
95 W midspan	

Notice!
Connect the 24 VAC connections from the MIC camera to the heater output of the power supply (VG4-A-PSU1 or VG4-A-PSU2).

Caution!
Compliance with EN50130-4 Alarm Standard – CCTV for Security Applications
To meet the requirements of the EN50130-4 Alarm Standard, an ancillary uninterruptable power (UPS) supply is necessary. The UPS must have a **Transfer Time** between 2–6 ms and a **Backup Runtime** of greater than 5 seconds for the power level as specified on the product datasheet.

13.3   Ethernet Connections

Caution!
Ethernet cables must be routed through earth-grounded conduit capable of withstanding the outdoor environment.
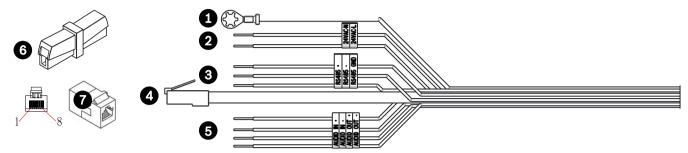
Cable Type	Cat5e/Cat6 Shielded Twisted Pair (STP) Ethernet (directly to the camera, or to a network switch between the camera and the network) **Note**: Cat5e/Cat6 Shielded Twisted Pair (STP) cable is required in order to meet European regulatory EMC standards.
Maximum Distance	100 m (330 ft)
Ethernet	10BASE-T/100BASE-TX, auto-sensing, half/full duplex
Terminal Connector	RJ45, Male

High PoE	For models with attached illuminators: Use the 95 W midspan sold by Bosch. For models without illuminators: Use the 60 W midspan sold by Bosch, or a midspan that is compliant to the IEEE 802.3at, class 4 standard.

Note: Consult the National Electrical Code (NEC) or other regional standards for cable bundling requirements and limitations.

13.4 Camera Connections

All electrical and data connections from the camera are made from the connectors in the base of the camera.

	Description	Wire Color
1	Chassis (Earth) ground wire (18 gage) with connector lug	Green
2	24 VAC power wires (24 gage) to Pins 4 and 5 of connector labeled P107 in VG4-A-PSU1 or VG4-A-PSU2 (if not using a High PoE network)*	Line (L) = Black Neutral (N) = White
3	RS-485 connections for communication to / from the MIC-ALM-WAS-24 or other device providing legacy serial protocol signals *	**+** = Purple **-** = Yellow **GND** = Brown
4	RJ45 (Cat5e/Cat6) connector (male) (supporting High PoE) for power and communication between a Bosch High PoE Midspan	
5	Audio wires (twisted pair cable recommended)	Audio IN + = Red Audio IN - = Light blue Audio OUT + = Orange Audio OUT - = Dark blue
6	Wire connectors on 9 wires (numbers 2, 3, and 5 in the corresponding graphic) **Note**: The quick clips should remain on unused wires. If the clips are removed, cover the exposed copper on the wires with electrical tape to prevent the unused wires from electrically shorting to one another or to the mount enclosure.	
7	RJ45 coupler (female to female)	

* [Not available on MIC inteox models.]

* For more information, refer to the installation manual Power Supply Units (AUTODOME VG5- and MIC IP Camera Models) (shipped with VG4-A-PSU1 and VG4-A-PSU2).

Note: If the MIC camera will be installed directly to a mounting surface, instead of onto a MIC DCA or a MIC wall mount bracket, Bosch recommends using the connector kit for your model of camera to protect the connections against moisture and dust particles. Each kit provides components for connecting as many as 5 MIC cameras.

– MIC-IP67-5PK (Connector kit for MIC IP ultra 7100i, MIC IP starlight 7100i, and MIC inteox 7100i cameras)
– MIC-9K-IP67-5PK (Connector kit for MIC IP fusion 9000i)

Not using the IP67 Connector Kit will void the camera warranty.

Note: The PoE connection is not intended to be connected to exposed (outside plant) networks.

Seal the base of the camera against moisture ingress (standing water).

14 Troubleshooting

Table of Troubleshooting Issues

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

Note: Refer to the Error Codes section of the manual for descriptions of the error codes that appear on the OSD. The section also lists recommended actions to resolve the error codes.

Camera reboots frequently or intermittently	Your camera has an improper network connection. Test your camera with another power supply. Check the Bosch website for a software update that might address the issue.

14.1 Physical reset button

Each camera has a hardware reset button. You may need to press the reset button to reset the camera to factory defaults if you encounter the following circumstances:

- You can power up the camera but cannot log on to the camera using the web browser.
- The camera doesn't start up, or fails to power up via PoE.
- The camera cannot search an IP address.
- The camera's firmware crashed.
- You forgot the password to access the camera.
- The image becomes frozen.
- You cannot update the firmware.
- The camera disconnects from the network at random and needs a reboot.
- The camera no longer finds pre-positions (preset positions).
- You cannot configure the camera using the web browser.
- The camera has no video out.

(i) **Notice!**

A factory default deletes all camera settings including passwords, network settings, and image settings.

Complete the following sequence of steps only if you have no other option to restore operation to the camera.

Steps to complete a hardware reset for all camera models

1. Apply power to the camera.
2. Find the IP address of the camera.
3. Log on to the camera using the web browser. (**Note**: You can use Configuration Manager to identify the IP address.)
4. Find the hardware reset button on the camera. (Refer to the figure below to find the reset button for your camera model.)
5. Push and hold the reset button for more than 8 seconds. The red LED indicator on the PCBA board will come on to show that the hardware reset started.

Note: You can also use a conductive wire to short the terminal block.

1. Let the camera complete a self-check. When the self-check completes, the red LED will go off.
2. Find the IP address again.
3. Access the camera using the web browser.
4. Set the initial **service**-level password for the camera.

15   Maintenance

Regular maintenance of your MIC camera will preserve the MIC, especially the surface finish, for an extended period.

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

In corrosive environments, you should clean the camera surface periodically with fresh water.

▸   Wash the camera thoroughly with fresh water:

–   Regularly (1-2 times per quarter, or more frequently if possible)

–   Immediately after an event such as a sea storm that could introduce a layer salt on the camera's surface

Use a flow rate of 150-145 liter/minute. Hold the nozzle a minimum distance of 1 m from the camera.

▸   In certain use cases, it might help to use a solution of hydrophobic liquid to prevent long-term buildup of salt layers on the camera's surface.

Note: Do not use water pressure greater than 96.5 kPa (14 psi) to wash the unit.

No User-serviceable Parts

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

On-Site Inspection

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

Information about cameras with illuminators

The text in this section applies only to cameras which have the optional illuminator accessory. When servicing the device, disconnect power to the device to avoid possible exposure to the eyes. If disconnecting power to the device is not possible, use appropriate shielding to block the LED arrays or wear appropriate eye protection.

Illuminator removal

If you must remove the illuminator because it is damaged or has failed, follow these steps:

1.   Remove the three (3) M4 Hex screws.

2.   Install the access plug (which may be stored in an access hole of the MIC-DCA or the wall mount accessory; if not, see the note below).

Note: If you do not have an access plug, **do not remove the illuminator** until you request and receive a new access plug from Bosch.

16 Decommissioning

16.1 Transfer

The unit should only be passed on together with this installation guide.

16.2 Disposal

Disposal - Your Bosch product was developed and manufactured with high-quality material and components that can be recycled and reused. 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 disused electronic and electrical products. Please dispose of these units at an environmentally compatible recycling facility, per European Directive 2012/19/EU.

17   Technical data

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

18 Best Practices for Outdoor Installation

Cameras installed outdoors are susceptible to surges and lightning. Always include surge and lightning protection when installing outdoor cameras.

The following figure is an illustration of the proper configuration for installing IP PTZ cameras (AUTODOME and MIC) outdoors with surge and lightning protection. Note that the illustration does not include representations of all models of AUTODOME and MIC cameras.

The illustration can represent any IP camera. Mounting hardware varies between units.
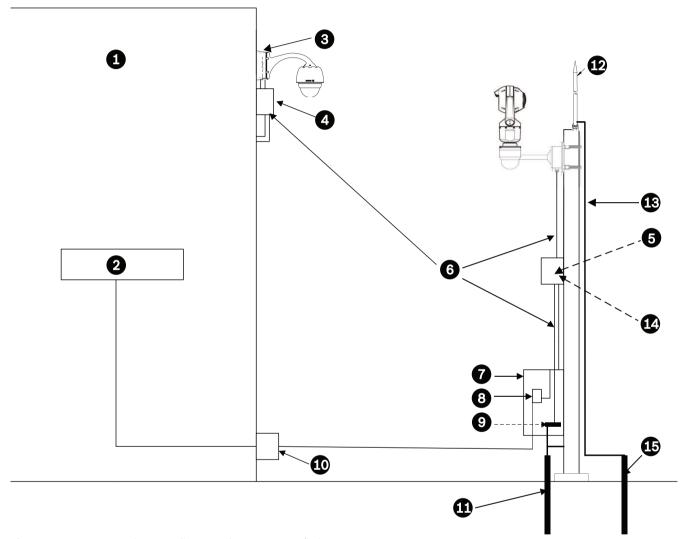
Figure 18.1: Correct outdoor installation with proper surge/lightning protection

1	Indoor main building	2	Network equipment
3	Connect the ground of the camera power supply to the building earth ground.	4	Surge protection
5	Connect the ground of the camera to the ground of the surge protector.	6	Install Cat5e/Cat6 (Shielded Twisted Pair (STP)) Ethernet cable. Route the cable through grounded, metal conduit. Isolate high voltage power lines in a separate conduit.
7	Equipment enclosure	8	Outdoor rated High PoE-compatible midspan
9	Connect the Bus Bar to the Equipment Grounding Electrode.	10	Outdoor High PoE-compatible surge protection to protect indoor equipment
11	Equipment Grounding Electrode	12	Lightning Rod
13	Down Conductor; refer to NFPA 780, Class 1 and 2.	14	Install outdoor High PoE-compatible surge protection as close as possible to the camera. Connect to the Equipment Grounding Electrode.
15	Lightning Rod Grounding Electrode		

19 Status Codes

Most status codes appear on the OSD until you acknowledge them. The codes identified with asterisks (**) appear for approximately 10 seconds, then disappear automatically.

Status Code	Description	Recommended action (to be completed by a qualified Service Technician)
2	Capacity of external PoE device is insufficient to support operation of the camera's window defroster. **Note**: MIC IP fusion 9000i only.	An incorrect type of PoE (such as one based on IEEE 802.3af) with insufficient power output may be connected to the camera.*
3	Capacity of external PoE device is insufficient to support operation of the camera's internal heater.	An incorrect type of PoE+ or PoE++ (such as one based on IEEE 802.3af or IEEE 802.3at) with insufficient power output may be connected to the camera.*
4	Capacity of the external PoE device is insufficient to support operation of the camera's window defroster. **Note**: MIC IP fusion 9000i only.	An incorrect type of PoE+ or PoE++ (such as one based on IEEE 802.3af or IEEE 802.3at) with insufficient power output may be connected to the camera.*
5	When operating using redundant power sources, the camera is detecting insufficient voltage being provided by the external High PoE power source.	1. Verify that the High PoE power source (midspan or switch) can provide 95 W of output power. 2. Verify that the network cable is not longer than 100 m maximum. 3. If using the 95W High PoE Midspan (NPD-9501A), verify that both LEDs are green. If not, refer to the "Troubleshooting" section of the installation manual of the midspan.
6	When operating using redundant power sources, the camera is detecting insufficient voltage being provided by the external 24 VAC power source.	1. Verify that the 24 VAC power source can provide at least 4.0 A to the camera. 2. Verify that the wire gage of the power cable is sufficient for the distance between the power source and the camera and that the voltage getting to the user cable of the camera is between 21 VAC and 30 VAC.
7	Camera may be operating in an environment where ambient temperature is below the specification of the camera.	1. Verify that the ambient temperature is not below -40 °C (-40 °F). 2. Review the diagnostic log of the camera (accessible from the **Service** menu) for errors related to the operation of the internal heaters. **Note**: Motorized zoom and focus functions of the visible camera lens will be disabled until the camera operates within the specified temperature range.

Status Code	Description	Recommended action (to be completed by a qualified Service Technician)
8	Camera may be operating in an environment where ambient temperature is above specification of the camera.	1. Verify that the ambient temperature is not above +65 °C (+149 °F). 2. Review the diagnostic log of the camera (accessible from the **Service** menu) for errors related to the operation of the internal fan. 3. Add the optional sunshield accessory to reduce internal heating caused by sun loading.
9	Camera has been subjected to high shock. Mechanical damage to the camera may exist.	1. Verify the integrity of the mechanical parts such as the arms and the pan body. 2. Verify the integrity/tightness of the external fasteners. Tighten where necessary. 3. If obvious damage is present, stop using the camera and contact the nearest Bosch Security Systems Service Center. 4. If no damage is evident, power the camera off and then on, and then evaluate operational performance. If the camera does not operate as expected, contact the nearest Bosch Security Systems Service Center.
10	Camera is detecting high humidity level inside housing. The integrity of the housing seal may be compromised.	1. Inspect the window for any cracks or obvious damage around the edge of the window. 2. Verify the integrity/tightness of the external fasteners. Tighten where necessary. 3. Verify the integrity of the mechanical seals around the tilt head, pan body, and arm joints. 4. If damage to the seals is obvious, contact the nearest Bosch Security Systems Service Center. 5. If no obvious damage is found, power the camera off and then on. If the status code reappears, contact the nearest Bosch Security Systems Service Center.
11	Wiper operation has been halted because of an obstruction.	1. Remove any obvious materials that are obstructing operation of the wiper. 2. If the obstruction is from ice buildup, review the diagnostic log of the camera (accessible from the **Service** menu) for errors related to operation of the internal heaters (and the window defrosters, for MIC IP fusion 9000i). If possible, tilt the camera so that the front faceplate is pointed straight up. (In this

Status Code	Description	Recommended action (to be completed by a qualified Service Technician)
		position, heat generated by the camera will help to melt ice buildup from its front faceplate area.) 3. If the obstruction is from extreme ice buildup, temporarily avoid operating the wiper until internal heaters, combined with a rise in ambient temperature, melt the ice buildup.
12	Left and Right Pan Limits have been set too close to each other.	Re-configure one camera stop limit or the other to increase the distance between limit stops to at least 10° apart.
13**	Autofocus has been turned off because of excessive focus activity.	1. If practical, increase lighting in the scene so that the focus function stops "hunting." 2. Use focus in manual mode or One-Push mode.
14**	Washer operation was attempted without washer pre-position being stored.	Configure the washer pre-position. If necessary, refer to the subchapter "Using the Wiper/Washer (Bosch AUX/Pre-position Commands)" in the User Manual for details on configuring washer functions.
15	Attempt was made to move to a pre-position that is mapped to an alternate function, so it is no longer associated with a location.	1. Select/configure a different pre-position number for the desired location. 2. Re-configure the pre-position assignment so that this number is no longer associated with an alternate function. Refer to the subchapter "**Pre-position mapping**" in the User Manual for details on re-mapping pre-positions.
16**	Motorized zoom function is programmed to operate at a high usage level in the Playback Tour. This high rate of usage could result in premature wear of the zoom motor.	Re-configure the camera to decrease the zoom activity to less than 30% during recording.
17	Motor operation has been halted due to an obstruction.	1. Remove any obvious materials that are obstructing operation of the camera pan/tilt function. 2. If the obstruction is from ice buildup, review the diagnostic log of the camera (accessible from the **Service** menu) for errors related to the operation of the internal heaters (and the window defrosters, for MIC

Status Code	Description	Recommended action (to be completed by a qualified Service Technician)
		IP fusion 9000i). If the log notes heater or defroster failure, contact the nearest Bosch Security Systems Service Center. 3. If operation is obstructed because of excessive ice buildup, temporarily avoid operating the pan/tilt functions of the camera until internal heaters, combined with a rise in ambient temperature, melt the ice buildup.
18**	When operating using redundant power sources, the camera has detected a loss of power from the external High PoE power source.	1. Verify the operating status of the external High PoE power source. 2. Verify the integrity of the electrical connections between the power source and the camera.
19**	When operating using redundant power sources, the camera has detected a loss of power from the external 24 VAC power source.	1. Verify the operating status of the external 24 VAC power source. 2. Verify the integrity of the electrical connections between the power source and the camera.
20	Camera is configured to use the "Hard Pan Limits" (HPL) feature, and it has been powered-up with pan position in the forbidden zone.	Temporarily remove one of the hard pan limits (as described in PTZ Settings), pan the camera out of the forbidden zone, and then restore the hard pan limit. Reboot the camera by powering the camera off and then on, or by clicking the button **Reboot** in the camera's web browser (**Configuration** > **Camera** > **Installer Menu** >**Reboot device**). **Note**: If pan movement is blocked only in one direction, but possible in the other direction (as when the camera is near the HPL), then no status code appears.

The Hard Pan Limits feature is for MIC cameras only.
Washer and wiper apply to MIC cameras only.

| 21 | Illuminator error: IR | Reboot the camera by powering the camera off and then on, or by clicking the button **Reboot** in the camera's web browser (**Configuration** > **Camera** > **Installer Menu** >**Reboot device**). If this action does not resolve the problem, contact the nearest Bosch Security Systems Service Center. The Service Center may |

		request information from the diagnostics log of the camera (accessible from the **Service** menu).
23	An internal error has occurred. (The optical video screen becomes blue for 1 or 2 seconds during the camera's recovery procedure.)	If this problem begins to occur on a regular basis: 1. Verify that the power source to the camera is not experiencing brown-out conditions. 2. Verify that the camera's earth ground connection is attached per earlier instructions. If these actions do not resolve this problem, contact the nearest Bosch Security Systems Service Center.

Caution!

If you choose not to use a switch or midspan with the appropriate Power Sourcing Equipment (PSE) chip, then the camera will not recognize the PoE as compliant, and the camera firmware may disable some or all functionality.

20   Support services and Bosch Academy

Support

Access our **support services** at www.boschsecurity.com/xc/en/support/.

Bosch Security and Safety Systems offers support in these areas:

–   Apps & Tools
–   Building Information Modeling
–   Warranty
–   Troubleshooting
–   Repair & Exchange
–   Product Security

Bosch Building Technologies Academy

Visit the Bosch Building Technologies Academy website and have access to **training courses, video tutorials** and **documents**: www.boschsecurity.com/xc/en/support/training/

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