



# DINION capture 5000/7000

VER Series



**BOSCH**

en Installation Manual



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# 1 Safety

## 1.1 Safety precautions

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### **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.

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### **WARNING!**



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

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### **CAUTION!**



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

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### **NOTICE!**



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

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## 1.2 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.

1. **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 aerosol cleaners.
2. **Heat Sources** - Do not install the unit near any heat sources such as radiators, heaters, stoves, or other equipment (including amplifiers) that produce heat.
3. **Object and liquid entry** - Never push objects of any kind into this unit through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electrical shock. Never spill liquid of any kind in the unit.
4. **Lightning** - For added protection during a lightning storm, or when leaving this unit unattended and unused for long periods, unplug the power source and disconnect the cable system. This will prevent damage to the unit from lightning and power line surges.
5. **Controls adjustment** - Adjust only those controls specified in the operating instructions. Improper adjustment of other controls may cause damage to the unit. Use of controls or adjustments, or performance of procedures other than those specified, may result in hazardous radiation exposure.
6. **Overloading** - Do not overload circuits. This can cause fire or electrical shock.
7. **Power cable protection** - Protect the power cable from foot traffic, from being pinched by items placed upon it, and at cable's exit from the unit.

8. **Power disconnect** - Units have power supplied to the unit whenever the power cord is inserted into the power source. The power cord plug is the main power disconnect device for switching off the voltage for all units.
9. **Power sources** - Operate the unit only from the type of power source indicated on the label. Before proceeding, be sure to disconnect the power from the cable to be installed into the unit.
  - 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 24 VAC units, voltage applied to the unit's power input should not exceed  $\pm 10\%$ , or 26.4 VAC. 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.
10. **Servicing** - Do not attempt to service this unit yourself.
11. **Damage requiring service** - Unplug the unit from the main AC power source and refer servicing to qualified service personnel when any damage to the equipment has occurred, such as:
  - the power supply cord or plug is damaged;
  - internal exposure to moisture, water, and/or inclement weather (rain, snow, etc.);
  - liquid has been spilled in the equipment;
  - an object has fallen into the unit;
  - unit has been dropped;
  - unit exhibits a distinct change in performance;
  - unit does not operate normally when the user correctly follows the operating instructions.

12. **Replacement parts** - Be sure 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.
13. **Safety check** - Safety checks should be performed upon completion of service or repairs to the unit to ensure proper operating condition.
14. **Installation** - Install in accordance with the manufacturer's instructions and in accordance with applicable local codes.
15. **Attachments, changes or modifications** - Only use attachments/accessories specified by the manufacturer. 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.

## 1.3 Important notices



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

**All-pole power switch** - Incorporate an all-pole power switch, with a contact separation of at least 3 mm in each pole, into the electrical installation of the building. If it is needed to open the housing for servicing and/or other activities, use this all-pole switch as the main disconnect device for switching off the voltage to the unit.

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



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### **NOTICE!**

#### **RISK GROUP 1**

IR emitted from this product.

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This product has been tested according to standard CIE/IEC 62471:2006 "Photobiological safety of lamps and lamp systems" and found to meet Risk Group 1 for exposure limit 4.3.7 "Infrared radiation hazard exposure limits for the eye." For other hazard exposure limits, the product was found to be exempt. Risk Group 1 is characterized in the standard as "products are safe for most use applications, except for very prolonged exposures where direct ocular exposures may be expected." Risk Group 1 sources do not pose an infrared radiation hazard for the eye for times less than 100 s at distances beyond 200 mm or 8 inches.

The Exposure Hazard Value for the product (ratio of the Exposure level to the Exposure limit) is up to 1.8 at a test distance of 200 mm or 8 inches. The Hazard Distance (distance beyond which the product falls into the exempt/safe group) is at most 350 mm or 14 inches. Note that typical operating distances for license plate capture (3.8 m or 12.5 feet and greater) are much greater than the Hazard Distance.

When servicing the unit, physically disconnect the power supply to avoid possible IR exposure to the eyes. If physical disconnection is not possible, use appropriate shielding to block the LED panel or use eye protection with a transmission of 50% or less at a wavelength of 850 nm.

**Coax grounding:**

- Ground the cable system if connecting an outside cable system to the unit.
- Follow proper safety precautions such as grounding for any outdoor device connected to this unit.

**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.

**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 2002/96/EC*



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

**Environmental statement** - Bosch has a strong commitment towards the environment. This unit has been designed to respect the environment as much as possible.

**Electrostatic-sensitive device** - Use proper CMOS/MOS-FET handling precautions to avoid electrostatic discharge.

NOTE: Wear required grounded wrist straps and observe proper ESD safety precautions when handling the electrostatic-sensitive printed circuit boards.

**Fuse rating** - For 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)*.

**Moving** - Disconnect the power before moving the unit. Move the unit with care. Excessive force or shock may damage the unit.

**Outdoor signals** - The installation for outdoor signals, especially regarding clearance from power and lightning conductors and transient protection, must be in accordance with *NEC725 and NEC800 (CEC Rule 16-224 and CEC Section 60)*.

**Permanently connected equipment** - Incorporate a readily accessible disconnect device external to the equipment.

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

**Power lines:** An outdoor system should not be located in the vicinity of overhead power lines, electrical lights, or power circuits, or where it may contact such power lines or circuits. When installing an outdoor system, extreme care should be taken to keep from touching power lines or circuits, as this contact may be fatal.

U.S.A. models only - refer to the National Electrical Code *Article 820* regarding installation of CATV systems.

**11-30 VDC / 24 VAC power source:** This device is intended to operate with a limited power source; this power source must comply with *EN60950*. The device is designed to operate at either 11-30 VDC or 24 VAC (if PoE is not available). User supplied wiring must be in compliance with electrical codes (Class 2 power levels). If 24 VAC is used, do not ground the 24 VAC supply at the terminals or at the device's power supply terminals.

**Connections:** The unit has connection terminals on flying leads. In wet or outdoor installations use a field wiring box with NEMA 3 or IP55 protection level or better. Make the connections inside the water tight compartment. After connections are made ensure that the watertight compartment is tightly closed and cables and conduits are properly sealed to prevent ingress of water.

**SELV** - All the input/output ports are Safety Extra Low Voltage (SELV) circuits. SELV circuits should only be connected to other SELV circuits.

Because ISDN circuits are treated like telephone-network voltage, avoid connecting the SELV circuit to the Telephone Network Voltage (TNV) circuits.

## 1.4 FCC & ICES compliance

### FCC & ICES Information

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

This device complies with *part 15* of the *FCC Rules*. Operation is subject to the following conditions:

- this device may not cause harmful interference, and
- this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a **Class A** digital device, pursuant to *Part 15* of the *FCC Rules* and *ICES-003 of Industry Canada*. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a **commercial environment**. This equipment generates, uses, and radiates radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his expense.

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)*

Ce produit est conforme aux normes *FCC partie 15*. la mise en service est soumise aux deux conditions suivantes :

- cet appareil ne peut pas provoquer d'interférence nuisible et
- cet appareil doit pouvoir tolérer toutes les interférences auxquelles il est soumis, y compris les interférences qui pourraient influencer sur son bon fonctionnement.

AVERTISSEMENT: Suite à différents tests, cet appareil s'est révélé conforme aux exigences imposées aux appareils numériques de **Classe A** en vertu de la *section 15 du règlement de la Commission fédérale des communications des États-Unis (FCC)*. Ces contraintes sont destinées à fournir une protection raisonnable contre les interférences nuisibles quand l'appareil est utilisé dans une **installation commerciale**. Cette appareil génère, utilise et émet de l'énergie de fréquence radio, et peut, en cas d'installation ou d'utilisation non conforme aux instructions, générer des interférences nuisibles aux communications radio. L'utilisation de ce produit dans une zone résidentielle peut provoquer des interférences nuisibles. Le cas échéant, l'utilisateur devra remédier à ces interférences à ses propres frais.

Au besoin, l'utilisateur consultera son revendeur ou un technicien qualifié en radio/télévision, qui procédera à une opération corrective. 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.

**NOTICE!**

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

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## 1.5 Bosch notices

### 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.

### Copyright

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### Trademarks

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### Note:

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. The ongoing development of the products may mean that the content of the user guide can change without notice. Bosch Security Systems accepts no liability for damage resulting directly or indirectly from faults, incompleteness, or discrepancies between the user guide and the product described.

### More information

For more information please contact the nearest Bosch Security Systems location or visit [www.boschsecurity.com](http://www.boschsecurity.com)

## 2 Description

The DINION capture is a specialty camera designed to capture consistent, high-quality images of vehicle license plates. Available in IP and analog versions, it is ideal for monitoring parking lots, public areas, and for controlling vehicle access. The DINION capture overcomes the problems encountered when using conventional surveillance cameras in vehicle identification and automatic license plate recognition applications. The Night Capture Imaging System delivers a burst of infrared illumination and simultaneously filters out visible light to ensure clear license plate images in complete darkness while eliminating the negative effects of headlight glare.

Advanced Ambient Compensation minimizes plate overexposure from sunlight for more accurate automatic license plate recognition. Finally, adjustable imaging modes allow for fine-tuning the imager for specific regions or license plate recognition algorithms.

### 2.1 Parts List

Quantity	Description
1	DINION capture 5000, or DINION capture 7000
1	3 mm Hex Key
1	5 mm Hex Key
1	Mounting Template
1	Printed Manual

## 3 Installing the DINION capture

This section provides instructions for mounting and wiring the DINION capture.

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### CAUTION!



The selected mounting location should not place the camera in a situation where its environmental specifications could be exceeded.

Ensure the selected location is protected from falling objects, accidental contact with moving objects, and unintentional interference from personnel. Follow all applicable building codes.

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### 3.1 Determining the Range

The DINION capture has a recommended operation range with specified optimal capture distance for each model as shown below. Installation should aim to control the traffic through one lane.

#### Ranges based on capturing:

520 x 115 mm (approximate) license plates on PAL units  
(xER-L2Ry-1)

12 x 6 in. (approximate) license plates on NTSC units  
(xER-L2Ry-2)

#### Field of View at Optimal Capture Distance:

##### License Plate Camera:

2.8 x 2.1 m (PAL units)

6 ft 6 in. x 4 ft 11 in. (NTSC units)

##### Overview Camera (DINION capture 7000):

Approximately twice the distance of the License Plate Camera.

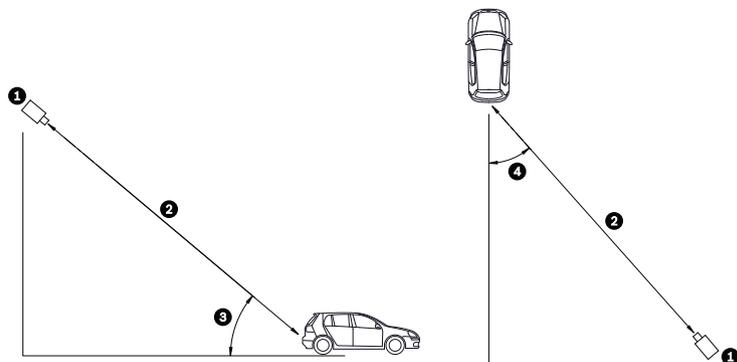
Model	Capture Range	Optimal Distance	HFOV	VFOV
VER-x2R1-1	3.8–6.4 m (12.5–21.0 ft)	4.9 m (16.0 ft)	31.9°	24.2°
VER-x2R1-2			23.0°	17.3°
VER-x2R2-1	5.5–9.1 m (18–30 ft)	7.1 m (23.1 ft)	22.3°	16.8°
VER-x2R2-2			16.0°	12.0°
VER-x2R3-1	7.9–13.7 m (26–45 ft)	10.2 m (33.5 ft)	15.6°	11.8°
VER-x2R3-2			11.1°	8.3°
VER-x2R4-1	11.3–19.5 m (37–64 ft)	14.8 m (48.4 ft)	10.8°	8.1°
VER-x2R4-2			7.7°	5.8°
VER-x2R5-1	16.5–28.0 m (54–92 ft)	21.3 m (70.0 ft)	7.5°	5.6°
VER-x2R5-2			5.3°	4.0°
<b>Note:</b> x = L (DINION capture 5000) or D (DINION capture 7000)				

**Table 3.1** Ranges for DINION capture 5000 and 7000 Analog Imagers

## 3.2 Determining the Angle

The maximum mounting angle of the license plate camera to the car is 40° for speeds up to 160 km/h (100 mph), both horizontally and vertically. This angle limits the amount of skew of the letters on the number plate. If the letters are skewed too much they will start to become unrecognizable and will reduce automatic software recognition rates.

For maximum performance ensure the mounting angle is as narrow as possible. To capture vehicle speeds up to 225 km/h (140 mph) the horizontal and vertical mounting angle should be less than 30°.



**Figure 3.1** Recommended Vertical and Horizontal Mounting Angle

1	DINION capture
2	Capture Range
3	Vertical Mounting Angle
4	Horizontal Mounting Angle

If the maximum range is exceeded, then the letters become smaller and more difficult to read. At the maximum range and angle the width of the number plate covers approximately 12% of the width of the screen.

### NOTICE!



The Capture Range is the distance from the license plate camera to the license plate. Working below the optimal capture distance allows a larger area for number plates and more accurate recognition but less lane area can be covered. If the imager is too close to the license plate, the plate could disappear from the field of view before it is captured.

## 3.3 Mounting the DINION capture



### CAUTION!

Installation should only be performed by a qualified service professional in accordance with the National Electrical Code or applicable local codes.

For a secure mounting installation, bolts should extend through the mounting surface and be secured with nuts, washers, and lock washers on the opposite side. If studs are used, they should be anchored in concrete or welded to a steel backer plate.

Refer to the *MBE Mounts and Adapters Installation Guide* for more details about attaching the bracket to an MBE-15 Pole Mount Adapter or to the MBE-17 Wall Mount Adapter.

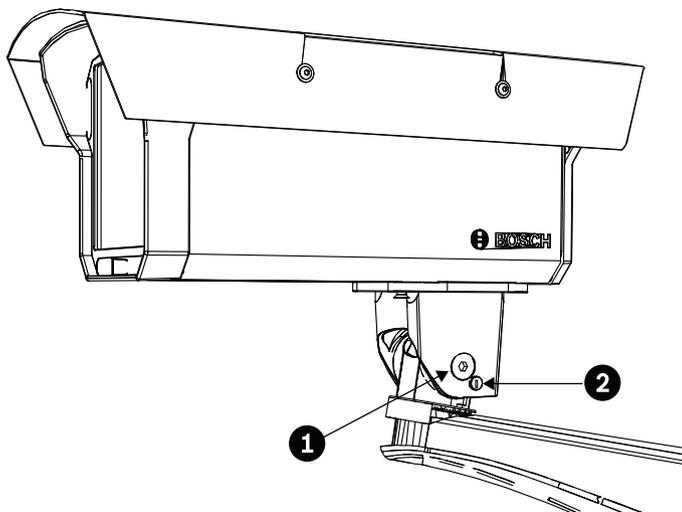
1. Use the wall mount template supplied in the packaging box to locate the four mounting holes for the camera bracket.
2. Drill four (4) holes for the mounting bolts. If installing outdoors, apply a weatherproof sealant around each hole at the mounting surface.
3. Route the cable. If routing the cable through the wall, drill a 25.4 mm (1 in.) hole following the wall mount template and use a weatherproof sealant to seal around the cable to ensure a weather tight seal between indoors and outdoors, otherwise route the cable through one of the side holes in the mounting bracket by removing the plug and routing the cable through.  
(Routing cables through a side hole in the bracket and into a near junction box makes setup and troubleshooting simpler.)



### WARNING!

A stud/bolt diameter of 6.0 mm (or 1/4 inch) able to withstand a 300 kg (660 lb) pull-out force is recommended. The mounting material must be able to withstand this pull out force.

4. Secure the mounting bracket to the mounting surface. Use four (4) corrosion-resistant, stainless steel studs or bolts, nuts, washers, and lock washers (not supplied).
5. Adjust the license plate camera angle using the range and angle recommendations in *Section 3.1 Determining the Range, page 17*.
  - Connect the imager to a local monitor to assist adjusting the license plate camera.
6. Adjust the tilt angle of the camera by loosening the tilt bolt (item 1, below) with the 5 mm hex key and the set screw (item 2) with a flat head screwdriver.



7. Place the license plate camera at the desired tilt angle and tighten the tilt bolt and the set screw.
8. Adjust the pan angle of the camera by loosening the pan bolt, located beneath the bracket mounting head, by loosening the pan bolt using the 5 mm hex key. Place the license plate camera at the desired pan angle and tighten the bolt.

---

**NOTICE!**

For purposes of evaluation and testing of the mounting bracket's integrity under static loading at CSA, the unit was mounted to a drywall surface as per the procedures below:

- Locate a stud in the wall and mark the outside edges of the stud.
- Using the wall mount bracket as a template, align the mounting hole with the center of the stud.
- Mark the point on the wall in the center of the hole where the mounting bolt will be positioned.
- Remove the wall mount bracket and drill a pilot hole at the marked point.
- Align the wall mount bracket mounting hole with the hole drilled in the wall.
- Using a screwdriver, secure the wall mount bracket by screwing a 2.5 in. screw with washer securely into the stud.
- Follow this procedure to attach the three remaining screws.



---

**NOTICE!**

The camera has not been evaluated for safety requirements using other mounting kits.



## 3.4 Preparing the Wiring



### CAUTION!

Before proceeding, disconnect the power from the power supply cable. Ensure that the voltage of the unit matches the voltage and type of the power supply being used.

The DINION capture 5000 comes pre-wired with a single two-wire power input lead and a single 75 ohm coaxial video cable output lead terminated with a BNC connector. The DINION capture 7000 comes pre-wired with a single two-wire power input lead and two 75-ohm coaxial video cables, one cable for each camera. On all units the video and power wires are encased in an approximately 2 m long cable, the last 10 cm of the cable the power and video breaks out separately.

### 3.4.1 Power Input Connections

A voltage regulator circuit allows for DC or AC operation between 11-30 VDC and 24 VAC. It also provides protection from voltage surges, transient spikes, and reversed voltage. Connect power from a 24 VAC or 11–30 VDC Class 2 power supply to the ferrule tipped power leads (red, black) from the camera. Use minimum AWG18 stranded wire.

#### Note:

For a **Class 2 AC/DC supply** the polarity does not matter.

### 3.4.2 Video Connections

The DINION capture provides male BNC connector outputs at the end of the cable. On the DINION capture 7000 the white video cable is for the license plate camera and the red cable is for the overview camera. A UTP adapter (VDA-455UTP) is available as an optional accessory to allow a UTP video cable to be connected to the BNC connector.

## 3.5 Making the Connections



### **WARNING!**

Before proceeding, disconnect the DINION capture from the power supply. Ensure that the voltage of the unit matches the voltage and type of the power supply being used.

The easiest way to connect the cables is as follows:

1. Bring the building connections through the surface cable hole so that they hang clear.
2. Connect the BNC connector of the license plate camera module to the video coax cable. For the DINION capture 7000, connect a video coax cable to the video output cables for both the license plate camera (white cable) and for the overview camera (red cable).
3. Connect the ferrule tipped power wires (red, black; polarity independent) from the license plate camera to the power supply connection.
4. In damp environments ensure that the connections are sealed inside a junction box or a field wiring box with NEMA 3 or IP55 protection level or better. Make the connections inside the water tight compartment. After connections are made, ensure that the watertight compartment is tightly closed and cables and conduits are properly sealed to prevent ingress of water.

## 3.6 Automatic Mode Switching

Automatic Mode Switching is a feature on the license plate camera that automatically compensates for bright conditions. Automatic Mode Switching, by default, operates by switching from Mode 1 (Normal) to Mode 2 (FullSun) when the ambient light levels rise above normal conditions (for example, bright sunlight on the scene). Automatic Mode Switching is inactive by default and requires setup to operate as desired.

In most conditions, Automatic Mode Switching may not be necessary. Activate the switch only if the license plate camera

operates as desired during darker conditions but overexposes the image during sunny conditions.

**IMPORTANT:** Only setup Automatic Mode Switching if the target license plate is in the sun and the captured image is overexposed, never setup if the license plate is in the shade.

### **Mode Details**

Mode 2 (FullSun) is two (2) gain points less than the normal mode, by default. You can modify both mode settings as needed in order to provide the desired image throughout the day.

When modifying settings first verify which mode is active:

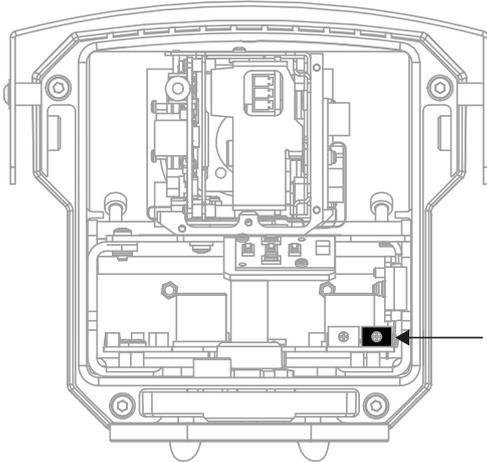
- Navigate to the Install menu (refer to *Section 4.1.2 Accessing Menu Keys, page 28*).
  - Access the Camera ID option and enable the Mode ID in any preferred position.
  - The active mode shows on the screen after a power cycle.
- If changes are made to Mode 1 (Normal) ensure that the offset change is made to Mode 2 (FullSun). For example, if the plate image is too bright in Mode 1 (Normal) and you change the gain from 8 to 6, then you should change the gain in Mode 2 (FullSun) from 6 to 4.

### **Important:**

After changes are made to any settings ensure the DINION capture is left in mode 1 under 'Mode' in the Main menu (refer to *Section 4.1 Menus, page 28*).

**To setup Automatic Mode Switching:**

1. Ensure to setup during the brightest conditions of the day, the plate image should appear very bright before setup.
2. Remove the back panel of the housing and enable the Mode ID position as shown in Mode details and complete a power cycle of the camera.
3. Locate the potentiometer on the right as shown below.



4. View the video output on a monitor.
5. Slowly turn the potentiometer counter-clockwise until the mode ID switches from mode 1 (Normal) to mode 2 (FullSun). The image should dim slightly.
6. If the image is still too bright, navigate to the Main menu for the license plate camera. Refer to *Section 4.1 Menus*, page 28.
7. Navigate to the Shutter/AGC menu.
8. Lower the fixed gain setting until the desired image is achieved.
9. If the lowest gain setting is reached and the image is still too bright try changing the shutter to 1/10000.

---

**To disable Automatic Mode Switching:**

1. Navigate to the Install menu for the license plate camera. Refer to *Section 4.1 Menus, page 28*.
2. Navigate to the Alarm I/O menu.
3. Select None for the Input Action option. Refer to *Section 4.6.3 Alarm I/O submenu, page 47*.

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**NOTICE!**

Shutter can also be changed to adjust plate brightness. Shutter is fixed at 1/5000 from the factory and should be changed only by an experienced user. Changing the shutter speed affects maximum capture speed of the vehicle and ambient rejection ability.

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## 4 Configuration

The DINION capture normally provides an optimal picture for capturing license plates without the need for further adjustments. Advanced setup options are available for getting the best results under special circumstances.

The DINION capture implements changes immediately so that before and after settings are easily compared.

### 4.1 Menus

#### 4.1.1 Top level menus

There are two upper level menus: a **Main** menu and an **Install** menu. The menus have functions that can be selected directly or submenus for more detailed set-up.

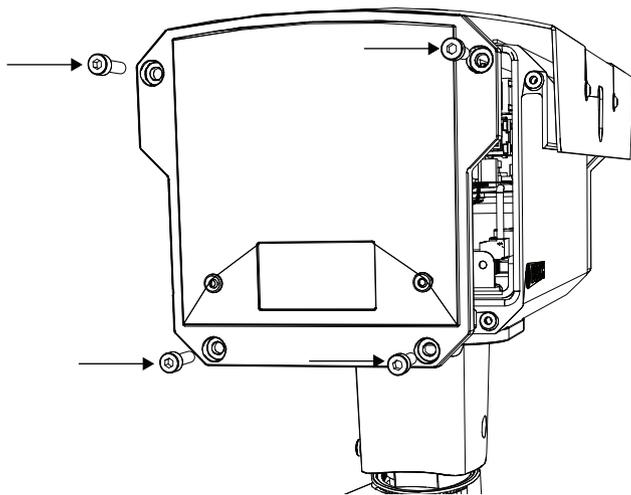
- To access the **Main** menu, press the menu/select button (center) for less than 1 second. The **Main** menu appears on the monitor. The **Main** menu allows you to select and set-up the picture enhancement functions. If you are not happy with your changes, you can always recall the default values for the mode.
- The camera also has an **Install** menu in which the installation settings can be set. To access the **Install** menu, press the menu/select button (center) for longer than 2 seconds.

#### 4.1.2 Accessing Menu Keys

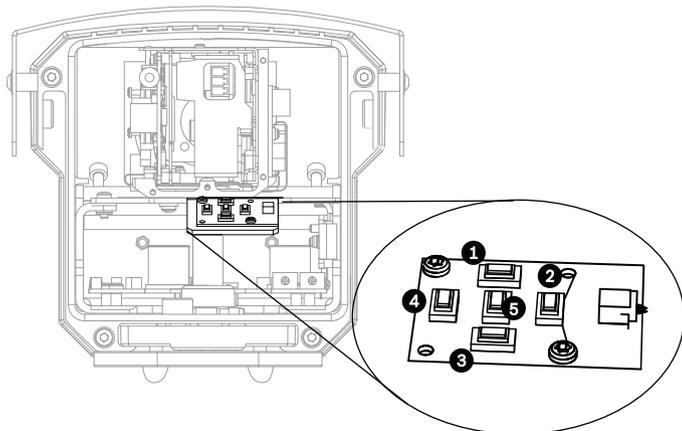
Five keys, located behind the rear panel of the license plate camera and the overview camera, are used for navigating through the menu system.

### To access the keypad for the license plate camera:

1. Remove the four (4) hex socket screws from the back panel using the supplied 3 mm hex key.



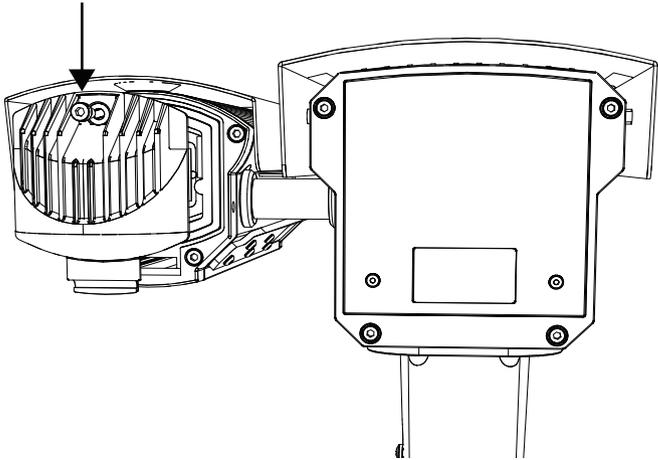
2. Locate the keypad inside the imager.



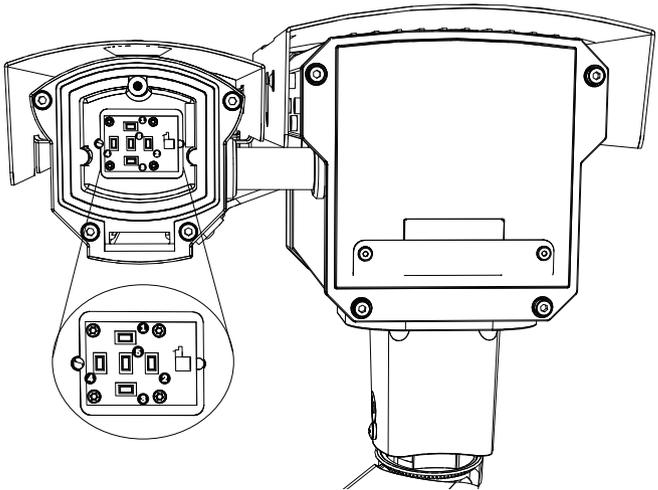
1	Up key
2	Right key
3	Down key
4	Left key
5	Menu/Select key

**To access the keypad for the overview camera:**

1. Remove the hex socket screw from the back panel using the supplied 3 mm hex key.



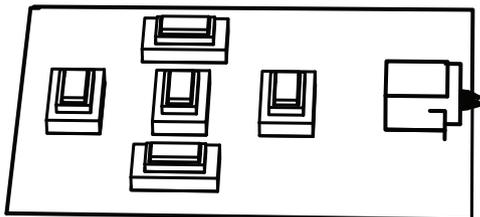
2. Locate the keypad inside the imager.



1	Up key
2	Right key
3	Down key
4	Left key
5	Menu/Select key

### 4.1.3 Menu Navigation Keys

Five keys are used for navigating through menu system.



- Use the up or down keys to scroll through a menu.
- Use the left or right keys to move through options or to set parameters.
- When in a menu, quickly double-press the menu/select key to restore the selected item to its factory default.
- To close all menus at once hold down the menu/select key until the menu display disappears or continually select the **Exit** item.

Some menus automatically close after about two minutes; other menus have to be closed manually.

## 4.2 Pre-Defined Modes

There are six operating modes settings to make configuration easier. In the license plate camera, Normal and FullSun modes are pre-programmed to work with Automatic Mode Switching. Any one of the six modes can be selected as the "switch-to" mode in Automatic Mode Switching, refer to *Section 4.6.3 Alarm I/O submenu, page 47*. The modes are defined as follows;

1. **Normal** (Mode 1)  
Default installation mode to provide stable pictures over a 24-hour period. These settings are optimized for out-of-the-box installation.
2. **FullSun** (Mode 2)  
Reduced gain to provide properly exposed image during bright conditions.
3. **Mode 3**  
Default settings.

4. **Mode 4**  
Default settings.
5. **Mode 5**  
Default settings.
6. **Mode 6**  
Default settings.

**NOTICE!**

In the overview camera, mode names by default are called Mode 1, Mode 2, etc.

---

### 4.3 Day/Night switching (DINION capture 7000)

The overview camera is equipped with a motorized IR filter. The mechanical IR filter can be removed in low-light or IR illuminated applications by software configuration settings. If **Auto** switching mode is selected, the camera automatically switches the filter depending on the observed light level. The switching level is programmable. In **Auto** switching mode the camera prioritizes motion (the camera gives sharp images without motion blur as long as the light level permits) or color (the camera gives color pictures as long as the light level permits). The camera recognizes IR illuminated scenes to prevent unwanted switching to color mode.

There are four different methods of controlling the IR filter:

- via an alarm input,
- via Bilinx communication,
- automatically, based on the observed light levels, or
- as part of the programmable mode profile.

## 4.4 Camera control communication (Bilinx)

The DINION capture is equipped with a coaxial communications transceiver (also referred to as Bilinx). In combination with VP-CFGSFT, the camera setting can be changed from any point along the coaxial cable. All menus can be accessed remotely giving full control of the camera. With this method of communication it is also possible to disable the local keys on the camera. To avoid loss of communication on an installed camera, the **Communication On/Off** selection is not available while using remote control. This function can only be accessed with the camera buttons. Bilinx communications can only be disabled using the buttons on the camera.

### Disabled camera buttons

When the Bilinx communications link is active, the buttons on the camera are disabled.

## 4.5 Main menu structure

Refer to *Section 4.1 Menus, page 28*, to access the Main menu.

Item	Selection	Description
Mode	Submenu	Sets up operating modes 1 to 6
ALC	Submenu	Video level control
Shutter/AGC	Submenu	Shutter and automatic gain control
Day/Night (Overview Camera - DINION capture 7000 only)	Submenu	Day/Night for color/mono operation
Enhance / Dynamic Engine	Submenu	Picture enhancement and performance
Color (Overview Camera - DINION capture 7000 only)	Submenu	White balance and color rendition
VMD	Submenu	Video motion detection

### 4.5.1 Mode submenu

Item	Selection	Description
Mode	1 to 6	Selects operating mode.
Mode ID	Alphanumeric	Mode name (10 characters maximum)
Copy active mode	Available mode numbers	Copies current mode settings to the mode number selected.
Default mode	Submenu	Restores camera to the factory default settings.
EXIT		Returns to main menu.

### 4.5.2 ALC submenu

#### NOTICE!



ALC, Peak average, and Speed settings apply to the overview camera in the DINION capture 7000 only. The license plate camera is pre-configured to operate in a fixed exposure mode, therefore ALC, Peak average, and Speed settings have no impact.

<b>Item</b>	<b>Selection</b>	<b>Description</b>
ALC level	-15 to +15	Selects the range within which the ALC will operate. A positive value is more useful for low-light conditions; a negative value is more useful for very bright conditions. Some ALC adjustment may improve scene content when Smart/BLC is enabled.
Peak/average	-15 to +15	Adjusts the balance between peak and average video control. A negative value gives more priority to average light levels; a positive value gives more priority to peak light levels. Video iris lens: choose an average level for best results (peak settings may cause oscillations).
ALC speed	Slow, medium, fast	Adjusts the speed of the video level control loop. For most scenes it should remain at the default value.
DVR/IP Encoder	On, Off	On - The camera output is optimized for connection to a DVR or IP encoder to compensate for compression methods. Off - The camera output is optimized for connection to an analog system (matrix switcher or monitor).
EXIT		Returns to main menu.

### 4.5.3 Shutter/AGC submenu

#### NOTICE!



Shutter settings should be changed only by an experienced user. Changing the shutter speed effects maximum capture speed of the vehicle and ambient rejection ability. The license plate camera Shutter is fixed at 1/5000 from the factory for maximum performance. The overview camera shutter is fixed at 1/500 for maximum performance (DINION capture 7000 only).

Item	Selection	Description
Shutter	AES, FL, Fixed	AES (auto-shutter) - the camera automatically sets the optimum shutter speed. FL - flickerless mode avoids interference from light sources (recommended for video-iris or DC-iris lenses only). FIXED - allows a user defined shutter speed (recommended setting).
Default (AES) shutter or Fixed shutter	1/50 (PAL), 1/60 (NTSC) 1/100, 1/ 120, 1/250, 1/500, 1/ 1000, 1/ 2000, 1/ 5000, 1/10K	In AES mode, the camera tries to maintain the selected shutter speed as long as the light level of the scene is high enough. In Fixed mode, selects shutter speed. If the optimal license plate image cannot be obtained by adjusting gain, increase the shutter speed to 1/10000 to darken the image or decrease the shutter speed to 1/2000 or more to brighten the image, however the maximum capture speed is reduced.

Item	Selection	Description
Actual shutter		Displays the actual shutter value from the camera to help compare lighting levels and optimum shutter speed during set-up.
Gain control	On, Fixed	On - the camera automatically sets the gain to the lowest possible value needed to maintain a good picture. Fixed - sets Fixed AGC value (best performance).
Maximum AGC or Fixed AGC	0 to 30 dB	Selects the maximum value the gain can have during AGC operation. Selects the gain setting for Fixed gain operation (0 is no gain). Increase gain if license plate image appears dark and decrease gain if plate appears bright.
Actual AGC		Displays the actual AGC value from the camera to help compare gain level with lighting levels and picture performance.
SensUp Dynamic	Off, 2x, 3x, ..., 10x	Selects the factor by which the sensitivity of the camera is increased. When active, some noise or spots may appear in the picture. This is normal camera behavior. It may also cause motion blur on moving objects.
EXIT		Returns to main menu.

#### 4.5.4 Day/Night submenu (Overview Camera - DINION capture 7000 only)

Item	Selection	Description
Day/Night	Auto, Color, Monochrome	<p>Auto - the camera switches the IR cut-off filter on and off depending on the scene illumination level.</p> <p>Monochrome - the IR cut-off filter is removed, giving full IR sensitivity.</p> <p>Color - the camera always produces a color signal regardless of light levels.</p>
Switch level	-15 to +15	<p>Sets the video level in Auto mode at which the camera switches to monochrome operation.</p> <p>A low (negative) value means that the camera switches to monochrome at a lower light level. A high (positive) value means that the camera switches to monochrome at a higher light level.</p>
Priority	Motion, Color	<p>In AUTO mode:</p> <p>Color - the camera gives a color image as long as the light level permits.</p> <p>Motion - the camera avoids motion blur as long as the light level permits (it switches to monochrome earlier than it would with Color priority).</p>

<b>Item</b>	<b>Selection</b>	<b>Description</b>
IR contrast	Enhanced, Normal	<p>Enhanced - the camera optimizes contrast in applications with high IR illumination levels. Select this mode for IR (730 to 940 nm) light sources and for scenes with grass and green foliage.</p> <p>Normal - the camera optimizes contrast in mono applications with visible light illumination.</p>
Color burst (mono)	On, Off	<p>Off - the color burst in the video signal is switched Off in monochrome mode.</p> <p>On - the color burst remains active even in monochrome mode (required by some DVRs and IP encoders).</p>
EXIT		Returns to main menu.

## 4.5.5 Enhance / Dynamic Engine submenu



### NOTICE!

The Enhance settings are factory set to work optimally for capturing license plates, only an experienced user should change these settings. Use discretion when changing settings.

Item	Selection	Description
Dynamic Engine	Off, XF-DYN, 2X-DYN*, SmartBLC	<p>Off - turns off all automatic scene detail and enhancements (recommended setting for license plate camera).</p> <p>XF-DYN - extra internal processing is enabled for low-light applications (traffic, etc.).</p> <p>2X-DYN - 2X-Dynamic adds dual sensor exposure to the XF-DYN features. In harsh lighting conditions pixels from each exposure are mixed to give a more detailed image (use 2X-DYN when SmartBLC is not required).</p> <p>SmartBLC - BLC window and weighting factor are automatically defined. Camera dynamically adjusts these for changing light conditions. Includes all the benefits of 2X-DYN.</p> <p><b>NOTE:</b> XF-DYN, 2X-DYN, or Smart BLC is not suitable for high shutter speed license plate capture.</p>
Autoblack	On, Off	Autoblack On automatically increases the visibility of details even when scene contrast is less than full-range due to mist, fog, etc.

Item	Selection	Description
Black level	-50 to +50	Adjusts the black offset level. A low (negative) value makes the level darker. A high (positive) value makes the level lighter and may bring out more detail in the darker areas.
Sharpness	-15 to +15	Adjusts the sharpness of the picture. A low (negative) value decreases noise but makes the picture less sharp. Increasing sharpness brings out more detail, but increases noise. Extra sharpness can enhance the details of license plates.
Dynamic noise reduction	Auto, Off	In AUTO mode the camera automatically reduces the noise in the picture. This may cause some motion blur on exceptionally fast moving objects immediately in front of the camera. This issue can be corrected by selecting Off.
Peak White Invert	On, Off	Use Peak White Invert to reduce glare from the CRT/LCD display. Use this setting with discretion.
EXIT		Returns to main menu.

## 4.5.6 Color submenu (Overview Camera - DINION capture 7000 only)

Item	Selection	Description
White balance	ATW, AWBhold, Manual	ATW - Auto tracking white balance allows the camera to constantly adjust for optimal color reproduction. AWBhold - Puts the ATW on hold and saves the color settings. Manual - the Red, Green, and Blue gain can be manually set to a desired position.
Speed	Fast, Medium, Slow	Adjusts the speed of the white balance control loop.
Red gain	-5 to +5  -50 to +50	ATW and AWBhold - adjusts the Red gain to optimize the white point. Manual - adjusts the Red gain.
Blue gain	-5 to +5  -50 to +50	ATW and AWBhold - adjusts the B gain to optimize the white point. Manual - adjusts the Blue gain.
Green gain	-50 to +50	Manual - adjusts the Green gain.
Saturation	-15 to +5	Adjusts the color saturation. -15 gives a monochrome image.
EXIT		Returns to main menu.

### 4.5.7 VMD submenu

Item	Selection	Description
VMD	Off, Silent, OSD	Off - Video Motion Detection (VMD) is off. Silent - video motion generates silent alarm. OSD - video motion generates on-screen text message alarm.
VMD area	Submenu	Select to enter the area set-up menu to define the detection area.
Motion indicator		Indicates the peak of measured motion in the selected area. Press either the right, left or center navigation button to reset.
VMD sensitivity		Sets the sensitivity for motion to the desired level. The longer the white bar, the more motion is required to activate the VMD alarm. Motion above this level activates alarm.
OSD alarm text	Alphanumeric	Text for on-screen display alarm (16 characters maximum).
EXIT		Returns to main menu.

#### Selecting an area for VMD masking

To set-up an area for VMD masking, access the area menu by selecting the **VMD Area** option from the VMD menu. Upon entering the **Area** menu, the current area is displayed with the upper left corner flashing. The flashing corner of the image can be moved with the Up, Down, Left, Right arrow keys. Pressing the Select key moves the flashing cursor to the opposite corner, which can now be moved. Pressing Select again freezes the area and exits the area menu.

There is one programmable VMD area.

**Note:**

When VMD is enabled, normal light fluctuations or environmental factors can contribute to false-positive alarms. Because of this, it is recommended that you do **not** connect the VMD-triggered alarm output of the camera to a monitored alarm system as the false-positive alarms may be considered a nuisance.

## 4.6 Install menu structure

Refer to *Section 4.1 Menus, page 28*, to access the Install menu.

Item	Selection	Description
Lens Wizard	Submenu	Select to optimize the camera-lens combination backfocus point.
Language	Submenu	Select on-screen display (OSD) language
Privacy masking	Submenu	Sets up a masking area
Alarm I/O	Submenu	Program the alarm input and output functionality.
Connections	Submenu	Connection parameters
Test signals	Submenu	Test patterns and texts
Camera ID	Submenu	Select to access ID submenu
Defaults	Submenu	Returns all settings for all modes to factory defaults

### 4.6.1 Language submenu

Item	Selection	Description
Language	English Spanish French German Portuguese Polish Italian Dutch Russian	Displays the menus on the OSD in the chosen language.
EXIT		Returns to Install menu.

### 4.6.2 Lens Wizard submenu



#### NOTICE!

The license plate camera lens is factory calibrated and does not require any adjustments. The overview camera lens should not require any adjustments, if applicable.

Item	Selection	Description
Lens type	Auto, Manual, DC- iris, Video	Auto: - automatically selects the type of lens. Manual, DC-iris, Video modes: select the matching lens type to force the camera to the correct lens mode.
Detected		Shows the type of lens detected when auto lens detection is used.

Item	Selection	Description
Set Backfocus now		Select to fully open the iris. Follow the instructions below for setting the backfocus for your particular lens type. After focusing the object of interest remains in focus under bright and low light conditions.
Set LVL		Only for video-iris lenses. Adjust the level control on the lens to center the level detector indicator (see below).
EXIT		Returns to Install menu.

### 4.6.3 Alarm I/O submenu

Item	Selection	Description
Alarm input	None, high, low	Select none to disable the alarm input. Select active-high or active-low for the alarm input connector. <b>Note:</b> Overview camera - DINION capture 7000 only.
Alarm action	None, Mode 1 to 6, Mono	Selects the switch-to mode of Automatic Mode Switching for the license plate camera, default is Mode 2. In the overview camera on DINION capture 7000 models, selects the operating mode of the camera when the alarm input is active.

Item	Selection	Description
Alarm output	VMD, External device, Night mode active, Filter toggle	VMD: - output relay closes on VMD alarms. External device: - make the output relay available to remote communication devices. Night mode active: - output relay closes when camera is in monochrome mode. Filter toggle: - output relay closes just before the IR filter starts moving and opens when video level has stabilized (2 to 3 seconds)
EXIT		Returns to Install menu.

#### 4.6.4 Connections submenu

Item	Selection	Description
Sync. input	High Z, 75 ohm	Select 75 ohm if the external sync input is not terminated elsewhere.
Notch filter	On, Off	Switches notch filter on or off. The notch filter can remove a Moiré pattern or color artifacts caused by closely spaced vertical lines or objects (e.g. vertical security bars over windows).
Cable compensation	Off, Default, RG59, RG6, Coax12	Cable compensation is used to avoid the need for amplifiers in long distance coaxial connections up to 1000 m (3000 ft). For optimum results select the coaxial cable type used or, if unknown, select default.

<b>Item</b>	<b>Selection</b>	<b>Description</b>
Compensation level	0,1,2 . . .+15	Sets the level of cable compensation
Bilinx Comms.	On, Off	If Off, Bilinx communications is disabled.
EXIT		Returns to Install menu.

#### **4.6.5 Test signal submenu**

<b>Item</b>	<b>Selection</b>	<b>Description</b>
Camera ID with Test	Off, On	Select On to overlay the camera ID on the video test signal.
Test pattern	Color bars 100%, Grayscale 11-step, Sawtooth 2H, Checker board, Cross hatch, UV plane	Select the desired test pattern to help installation and fault-finding.
EXIT		Returns to Install menu.

## 4.6.6 Camera ID submenu

Item	Selection	Description
Camera ID		Enter a 17-character camera name. Use Left/Right to change position in the string; use up/down to select character. Use Select to exit.
Display ID pos.	Off, Top left, Top right, Bottom left, Bottom right	Select the screen position of the camera ID.
Display mode ID	Off, Top left, Top right, Bottom left, Bottom right	Camera mode is displayed on the screen in the selected position.
Camera ID border	On, Off	Displays a grey border behind the camera ID to make it easier to read.
MAC address		Shows MAC address (factory set, cannot be changed).
Ticker bars	On, Off	The ticker bar moves continuously to show that the image is live and not frozen or played back.
EXIT		Returns to Install menu.

## 4.6.7 Privacy masking submenu

Item	Selection	Description
Pattern	Black, Grey, White, Noise	Selects pattern for all masks.
Mask	1, 2, 3, 4	Four different areas can be masked.
Active	On, Off	Turns each of the four masks on or off.
Window	Submenu	Select to open a window in which to define the mask area.

### Selecting an area for privacy masking

To set-up an area for privacy masking, access the area menu by selecting the **Area** option from the privacy masking menu. Upon entering the **Area** menu, the current area is displayed with the upper left corner flashing. The flashing corner of the image can be moved with the Up, Down, Left, Right arrow keys. Pressing the Select key moves the flashing cursor to the opposite corner, which can now be moved. Pressing Select again freezes the area and exits the area menu.

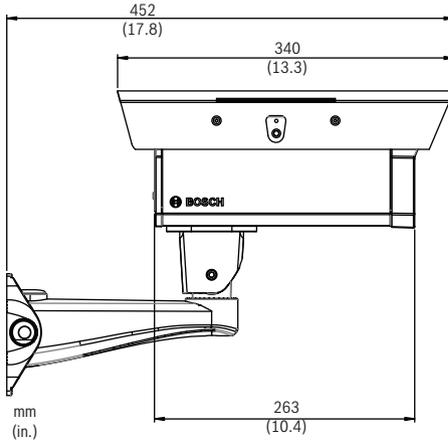
There are four programmable privacy mask areas.

## 4.6.8 Defaults submenu

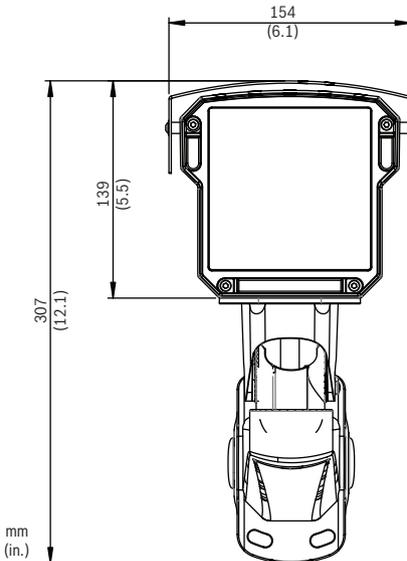
Item	Selection	Description
Restore All	No, Yes	Restores all settings of the six modes to their default (factory) values. Select YES then press the Menu/Select button to restore all values. When completed the message RESTORED! is shown.

# A Dimensional Drawings

## DINION capture 5000

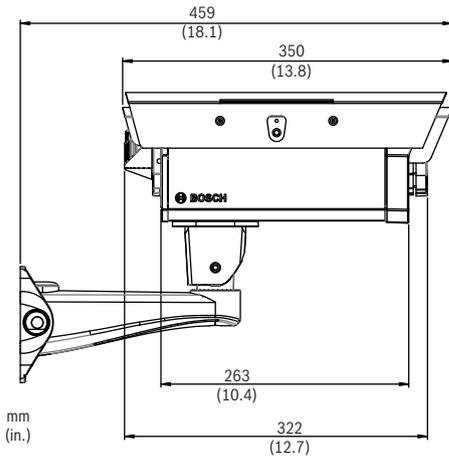


**Figure 1.1** DINION capture 5000 – Side View

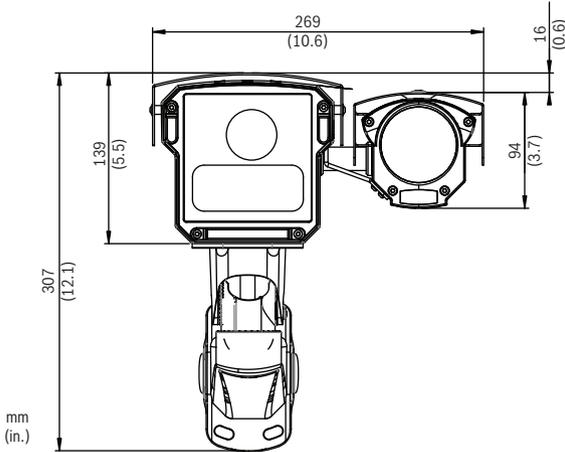


**Figure 1.2** DINION capture 5000 – Front View

### DINION capture 7000



**Figure 1.3** DINION capture 7000 – Side View



**Figure 1.4** DINION capture 7000 – Front View





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