



# EDGEVIS HD-IP470

## HARDWARE INSTALLATION GUIDE

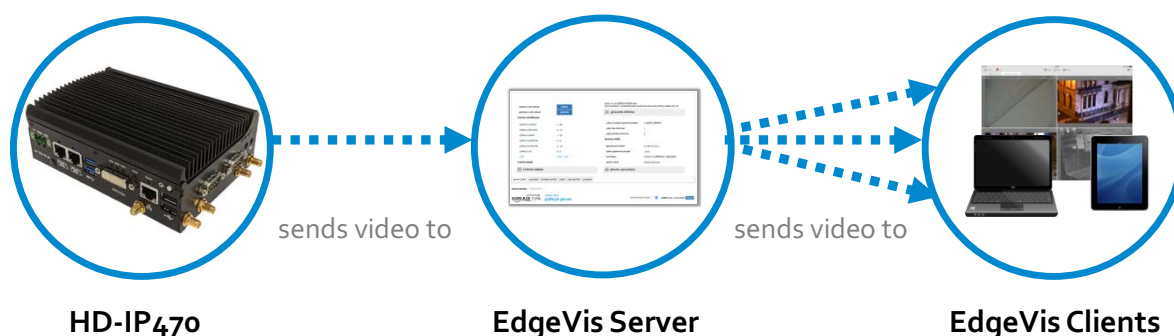
VERSION 8.1 – MARCH 21

Thank you for purchasing the EdgeVis HD-IP470. This document explains how to physically configure the HD-IP470. As well as identifying the available connectors and status indicators on the device, it also details how to add your desired SIM card to it. This document should be read in conjunction with the **IP Series, HD-Q800, 4K-R800 - Setup Guide**, which covers the web-based setup interface for all devices in the IP Series range, including the HD-IP470.

## Introduction

Before proceeding with the installation and setup of your HD-IP470 unit, please ensure that you check the package contents listed below, refer to the installation notes on the next page and consult the Quick Start Guide that was supplied with your unit for step-by-step instructions on preparing hardware and software components.

To operate this device you will need to set up, or have access to, the following architecture:



To proceed you must have access to an EdgeVis Server, with an account created for the encoder to use. If you do not have an EdgeVis Server available refer to **EdgeVis Server Quick Start Guide** which will walk through the steps required to install the server and create the necessary accounts required to proceed.

## What is in the box?

EdgeVis encoder	EdgeVis HD-IP470
Accessories	AC/DC 12V power supply, mains power lead, DC power block, two cellular antennae, two Wi-Fi antennae, cellular modem thermal pad, mounting plate
Printed materials	Quick Start Guide

## How do I configure the HD-IP470 unit?

After the introduction, there are three sections in this document that help you to configure your HD-IP470 unit:

Section 1	Basic operations of the unit <i>Powering the unit and connecting devices or drives to the HD-IP470</i>
Section 2	Configuring communications on the HD-IP470 <i>Connecting to wired, Wi-Fi and cellular network</i>
Section 3	Next steps... <i>With the HD-IP470 unpacked and wired, what are the steps required to set up the encoder?</i>
Appendix A	Troubleshooting and frequently asked questions <i>Potential hardware issues that may be encountered with an HD-IP470</i>

## SAFETY NOTES

The HD-IP470 can operate in temperatures from -20°C to +50°C (+55°C without POE) whilst powered from 12V – 35V DC.



All deployments of an HD-IP470 encoder unit should ensure that the device is not mounted:

- Within explosive zones
- Within 0.5m of a powered transmitter and/or receiver antenna
- Within the engine bay/compartment of a vehicle
- Within 1m of a vehicle fuel fill point (direct line of sight)

**WARNING:** The HD-IP470 Encoder has been designed to operate from an 12V – 35V DC supply. Do not connect it directly to mains power outlet. Use the AC/DC adapter supplied with the unit.



The following precautions must be taken to avoid damage to the unit:

- DO NOT CONNECT DIRECTLY TO THE MAINS SUPPLY
- Always ensure the supply is within the specified voltage range and employ suitable filtering if voltage spikes are likely
- Do not reverse the polarity of the DC power supply. It will cause irreparable damage to the HD-IP470
- Always provide a common ground between the HD-IP470 unit and all connected equipment

**WARNING:** Do not exceed power supply input voltage.



Do not connect to a power supply over 35V – this will damage the unit.

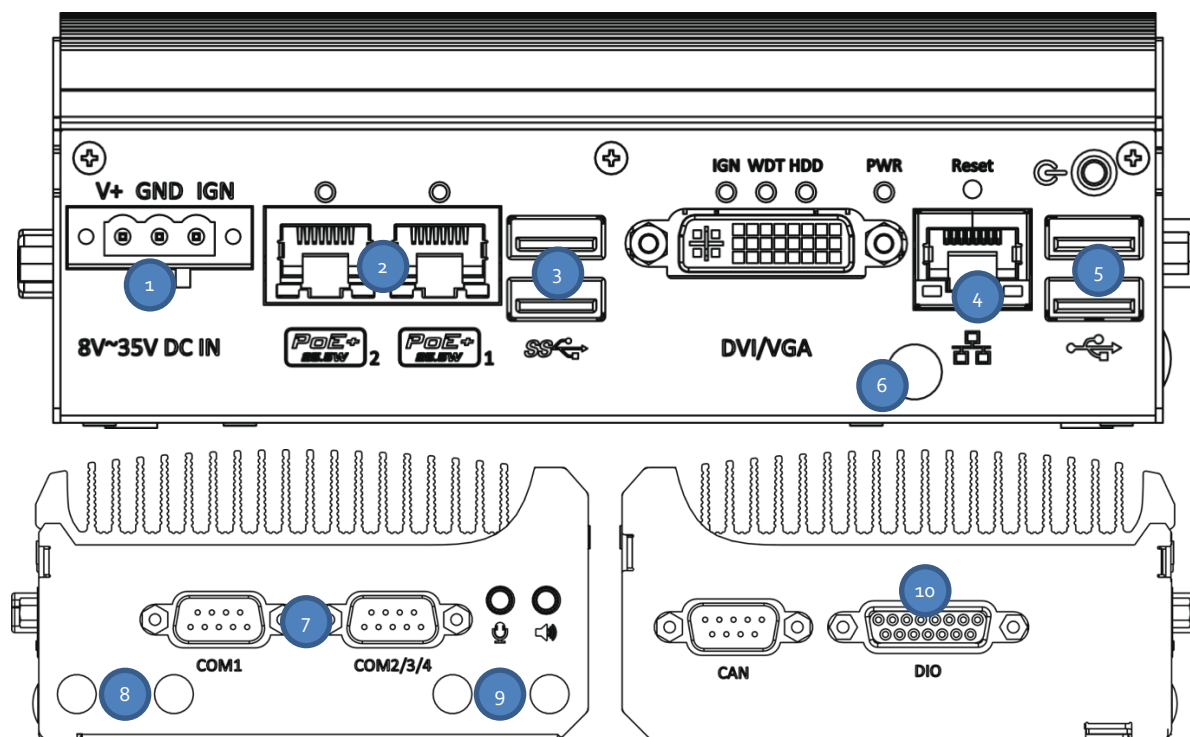
**WARNING:** Failure to observe these precautions will invalidate the warranty.

## Section 1- Basic operations of the unit

The EdgeVis HD-IP470 is a small and robust device, ideally suited for use in fixed installations for the recording and live streaming of video from a multiple IP cameras.

### Device connectors

The HD-IP470 features integral TVI streaming using an internal 4G modem, internal Wi-Fi adapter or wired LAN, and archiving onto internal drive. The device supports the connection of multiple IP cameras. Connectors for the HD-IP470 are shown below.



#### Panel Layout

1	Power input connector.	6	GPS antenna connector.
2	PoE+ ethernet ports	7	Serial ports.
3	USB 3.0 ports.	8	Wi-Fi antenna connectors.
4	Ethernet port.	9	Cellular antenna connectors.
5	USB 2.0 ports.	10	Digital I/O triggers port.

Note: DVI/VGA, CAN, audio connectors and power button are not used.

## Powering the device and switching it on/off

To switch the unit on simply connect the output cable from the AC/DC adapter to the DC input connector on the front panel of the HD-IP470 and connect the AC/DC adapter to the mains power outlet. Alternatively, wire up an appropriate DC input cable to the encoder that supplies 9-35V DC.

## Default LAN port IP Addresses

For ease of deployment each LAN port on the HD-IP470 device is pre-configured with a static IP address:

LAN Port	Default IP Address	Subnet mask
LAN	192.168.10.1	255.255.255.0
PoE+ 1	192.168.11.1	255.255.255.0
PoE+ 2	192.168.12.1	255.255.255.0
USB Ethernet (not supplied)	192.168.20.1	255.255.255.0

## Connecting IP cameras

The HD-IP470 allows for connection of multiple IP cameras via the **ethernet** ports located on the front of the unit. The cameras should be connected to the device using standard Ethernet cable.

Refer to Section 2 of the **IP Series, HD-Q800, 4K-R800 - Setup Guide** for details on configuring the Ethernet ports and IP cameras to work together. The list of specific cameras supported on the IP Series of products can be found on the Support site: <http://tvi-support.digitalbarriers.com>

## Storage medium

The HD-IP470 can record video to the internal drive or an external USB storage device. For further details on how to properly prepare a recording disk refer to Section 2 of the **IP Series, HD-Q800, 4K-R800 - Setup Guide**.

## Updating the software on the unit

Once notified of a new software release by Digital Barriers, updates are available for download from the EdgeVis support site (see below for link) for installation onto the device.

There are two ways to update the firmware – locally using a USB Pen, or remotely using EdgeVis Server.

- To update remotely, upload the new firmware to the **Firmware** page within the EdgeVis Server web interface and then, from the **Encoder's** status and diagnostics page, select **Upgrade Firmware** from the menu on the right-hand side.
- To update locally, copy the update onto a USB flash drive and insert into a USB port on the front of the unit. The flash drive can be inserted into a running unit or before the unit is powered up. The update procedure will commence silently when the USB pen is detected, wait 30s to allow the encoder to find and install the firmware update. After the firmware is installed it is safe to remove the pen and the unit will automatically reboot.

To access or register for the Digital Barriers Support Site, visit [tvi-support.digitalbarriers.com](http://tvi-support.digitalbarriers.com)

## Section 2 - Configuring communications on the HD-IP470

The HD-IP470 supports communications over wired LAN, Wi-Fi and Cellular. Refer to the **IP Series, HD-Q800, 4K-R800 - Setup Guide** for instructions on this step.

### Connecting over a 3G/4G cellular network

A valid mobile SIM card is required in order to connect the HD-IP470 over a cellular communications bearer. The unit has an inbuilt modem for 3G/4G connection with 3G/4G antenna connectors on the side of the device. **Note:** despite the ultra-efficient bandwidth usage achieved by TVI, the HD-IP470 is considered a heavy data use product on cellular networks. It is recommended that an unlimited data plan (or if unavailable, a heavy consumption data plan) is set up with your Mobile Network Service Provider for use with the HD-IP470.

The SIM card holder is located inside the unit under the modem card – this supports a standard size SIM card. To install micro or nano size cards an adaptor will be required.

Before installing the SIM card:



- The unit should be disconnected from the power supply when installing the SIM card.



- Take precautions to prevent static discharge when handling components.

To install the SIM card carefully follow these steps:

#### Remove the hatch



Unscrew and safely store the four black bolts holding the base hatch in place. Then remove the hatch.



## Access the SIM card holder



Remove and store the silver bolt that holds the MODEM in place.

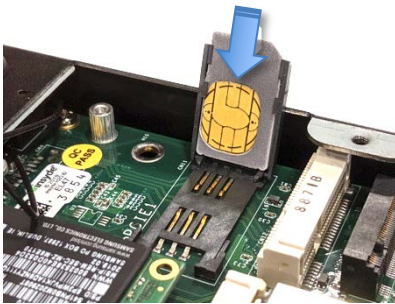


Raise the MODEM without removing the three antenna connectors.

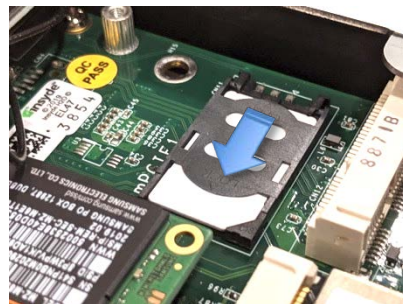


Lift the modem to the side to access the SIM holder. Slide the top of the SIM holder back to unlock it.

## Insert the SIM card



Lift the top of the SIM holder and insert the SIM card.

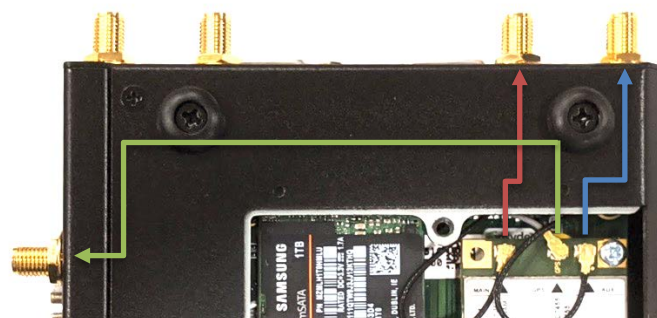


Close the SIM holder then slide it to lock the SIM in place.



Insert the MODEM into the header. Ensure the antenna cables are not snagged or pinched and secure the MODEM using the silver bolt.

## Check connections and replace the hatch



- Check the RF wires are still connected as shown
- A thermal pad has been supplied with the HD-IP470. If not in place already, attach to the cellular modem
- Replace the hatch and secure it using the four black bolts.



## Connecting over a wired LAN connection

When using a wired LAN connection as the communications bearer, connect an Ethernet cable into the LAN connector on the front of the HD-IP470.

The encoder also includes a driver for the USB to Ethernet adapters using the Asix AX88772 chipset. Any USB LAN Adapter that uses this chipset should be compatible with the encoder. Devices known to contain the Asix AX88772 include:

- Edimax EU-4028 USB 2.0 Fast Ethernet Adapter
- Apple USB to Ethernet adapter
- UtechSmart USB 2.0 to 10/100 Fast Ethernet LAN Wired Network Adapter

## Section 3 – Next Steps...

After unpacking the encoder, inserting a SIM card, and wiring up your encoder the next step is to perform the initial setup, where comms settings, server details and IP Cameras are configured.

### Setting up the encoder

With the encoder unpacked and all of the physical setup complete it is time to set up the encoder so that it is available on the EdgeVis Server for viewing. Refer to the **IP Series, HD-Q800, 4K-R800 - Setup Guide** for further details.

## Appendix A - Troubleshooting and frequently asked questions

### How many channels does the HD-IP470 support?

The HD-IP470 can record up to eight cameras and transmit one of those cameras. It is possible to create multiple quad-views allowing four cameras to be transmitted simultaneously.

### What level of recording and streaming performance is achievable?

Based on the processing power of the HD-IP470, the unit can achieve 25/30 fps of 1080p quality recording whilst simultaneously streaming one 1080p video stream at 10fps.

### What recording functions does the HD-IP470 support?

The HD-IP470 can be set up to record continuously, or to record on an alarm trigger. Recordings can be set to overwrite old recordings automatically, or to stop on full.

### What indicative recording times and streaming rates are achievable?

The HD-IP470 records the incoming video stream from IP cameras without modification. By default, cameras are automatically configured by the encoder to 1080p @ 25/30fps at a bitrate of 10 Mbps when added to an encoder. This will provide approximately 8 days recordings at a very high quality (multiple cameras will proportionally reduce this duration) on the supplied 1TB drive.

After adding the camera, and by using the camera's own configuration interface, the user is usually able to manually configure lower quality setting on their IP cameras to extend the duration of recordings if necessary. This table provides an indication of the potential increase in duration possible:

Frame rate	IP Camera b/w	1TB SDD
1 fps	1.4 Mbps	64 days
6.25 fps	3 Mbps	32 days
12.5 fps	5 Mbps	16 days
25 fps	7 Mbps	12 days

720p cameras are approximately half of the resolution of 1080p (and standard definition cameras are approximately 1/4 of the resolution of 1080p) and as such will use proportionally less data.

## What bearers can the HD-IP470 use to transmit video to EdgeVis Server?

The HD-IP470 includes an inbuilt 4G/LTE cellular modem for efficient streaming over commercially available cellular networks. It can also transmit using its inbuilt LAN port or Wi-Fi module. EdgeVis optimises its transmission to the characteristics of the bearer that it is being used to maximise performance.

## How does EdgeVis Server licensing work in relation to the HD-IP470?

The EdgeVis Server licensing model is based on the number of cameras connected to the encoder. An HD-IP470 unit therefore requires up to **eight** encoder licences for licensing purposes (if all eight cameras are being utilised). These licences must either be of type EdgeVis Lite, Enhanced or Enterprise, depending on the feature set desired.

## Which IP cameras are supported by the HD-IP470?

The list of specific cameras supported on the IP Series of products can be found on the Support site:

<http://tvi-support.digitalbarriers.com>.

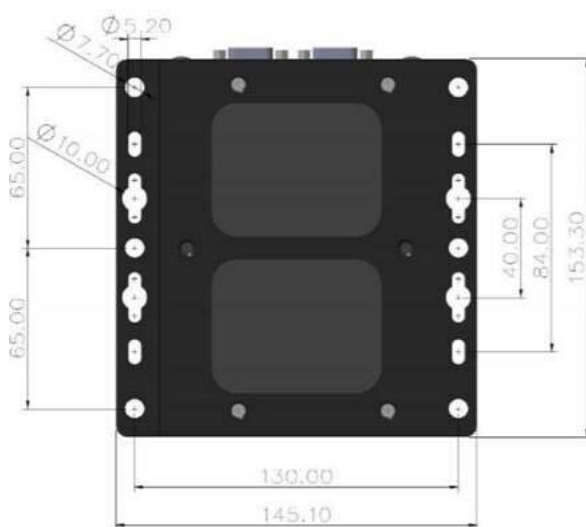
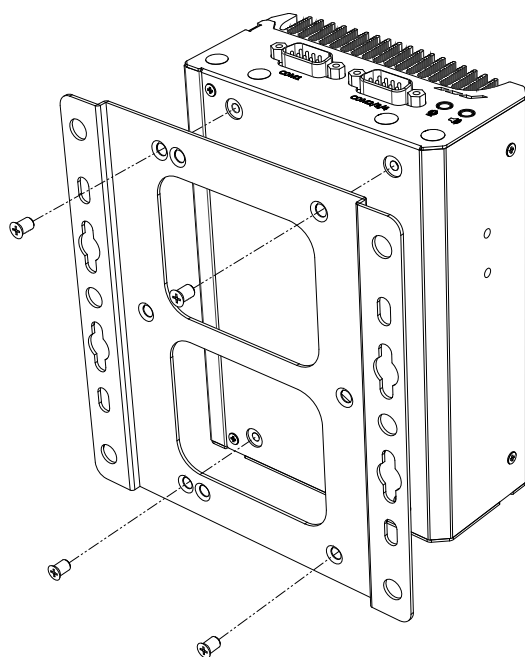
## Appendix B – Vehicle Installation

The HD-IP470 unit is designed for in-vehicle deployment.

### Dimensions and fixings for in-vehicle installation

Ensure that you have adequate space to install the HD-IP470 mounting plate and unit with access to the camera inputs, antenna connections and removable storage device on the front plate. The 8~35V battery input power connection is located on the side of the unit and this should be factored in when siting the unit in a vehicle.

To install the mounting plate, remove and retain the bolts holding the rubber feet to the unit. Remove the rubber feet. Install the mounting plate and secure it by replacing the bolts through into the base of the encoder.



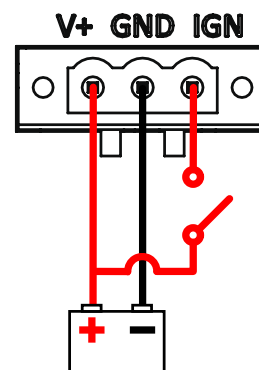
## Connecting the HD-IP470 to a vehicle battery

The HD-IP470 can be powered directly from a vehicle battery – either a 12V or 24V power source.

When installing in a vehicle, the following connections must be made to the power input connectors on the rear of the unit:


- Connect negative to the contact marked 'GND' on the DC input connector.
- Connect positive to the contact marked 'V+' on the DC Input connector.
- Connect ignition line to the contact marked 'IGN' on the DC Input connector.

Note: the unit will power up 10 seconds after the IGN switch is connected and will switch off 10 seconds after the IGN switch is disconnected.





## Appendix C – Technical specification and connectors

FRONT: POWER		
Bulkhead Connector: 3-pin Cable Connector: 9-pin Note: <ul style="list-style-type: none"> <li>The system accepts DC input in the range 8V to 35V via a 3-pin connector. The screw clamping mechanism on the terminal block offers additional connection reliability when wiring DC power.</li> </ul>  <p>The following precautions must be taken to avoid damage to the unit:</p> <ul style="list-style-type: none"> <li>DO NOT CONNECT DIRECTLY TO THE MAINS SUPPLY</li> <li>Always ensure the supply is within the specified voltage range and employ suitable filtering if voltage spikes are likely</li> <li>Do not reverse the polarity of the DC power supply. It will cause irreparable damage to the HD-IP470</li> </ul> <p>Always provide a common ground between the HD-IP470 unit and all connected equipment</p>	V+	8V – 35V
	GND	NC
	IGN	Ignition command line, connect to V+ line to signal the unit to power on.

SIDE: COM1		
Bulkhead Connector: 9-pin D-Sub Male Cable Connector: 9-pin D-Sub Female	1	DCD
	2	RX
	3	TX
	4	DTR
	5	GND
	6	DSR
	7	RTS
	8	CTS
	9	RI

**SIDE: COM2/3/4**

Bulkhead Connector: 9-pin D-Sub Male

Cable Connector: 9-pin D-Sub Female

Note:

- All pins marked NC are reserved for future use. Do not connect these pins.

1	-
2	COM <sub>2</sub> RX
3	COM <sub>2</sub> TX
4	NC
5	GND
6	NC
7	NC
8	NC
9	-

**SIDE: DIO**

Bulkhead Connector: 15-pin D-Sub Female

Cable Connector: 15-pin D-Sub Male

Note:

- All pins marked NC are reserved for future use. Do not connect these pins.

The input voltage for logic high is 5V – 24V, and the input voltage for logic low is 0V – 1.5V.

1	D_INPUT_0
2	D_INPUT_1
3	D_INPUT_GND
4	NC
5	NC
6	NC
7	NC
8	VDD
9	D_INPUT_GND
10	D_INPUT_2
11	D_INPUT_3
12	NC
13	NC
14	NC
15	-

## FCC COMPLIANCE

This equipment has been tested and found to comply with the limits of a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with instructions, may cause harmful interference to radio communications. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected

The EdgeVis HD-IP470 unit may contain a radio module that has been FCC Approved for fixed and mobile applications (FCC ID: N7NMC7455 Contains transmitter module IC: 2417C-MC7455 where 2417C-MC73542417C-MC7355 is the module's certification number).

The EdgeVis HD-IP470 unit may contain a radio module that has been FCC Approved for fixed and mobile applications (FCC ID: PD97260H).

FCC Warning: changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

To meet the FCC's RF exposure rules and regulations:

- The use of a non-shielded interface cable with the EdgeVis HD-IP470 Encoder device is prohibited
- The antenna(s) used with the EdgeVis HD-IP470 unit must be installed to provide a separation distance of at least 20cm (8 inches) from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter
- The antenna(s) used with the EdgeVis HD-IP470 unit the antenna gain, including cable loss, must not exceed 6 dBi at 700 MHz, 850 MHz, 1700 MHz and 1900 MHz; 9 dBi at 2500/2600 MHz; and 1 dBi at 2300 MHz, as defined in 2.1091 for satisfying RF exposure compliance.

The EdgeVis HD-IP470 unit shall only be used for fixed and mobile applications.

## CE COMPLIANCE STATEMENT

The EdgeVis HD-IP470 Encoder complies with the following European Union Directives:

- Low Voltage Directive LVD 2014/35/EU (Standards: EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013)
- Electromagnetic Compatibility EMC 2014/30/EU Annex II (Standards: EN 55032:2015, EN 61000-3-2: 2014, EN 61000-3-3: 2013, EN 55024: 2010+A1: 2015)

The Encoder contains a radio module that has been approved for integration into fixed and mobile applications. In order to satisfy the requirements for integrating the radio module the unit is compliant with the following standards:

- Radio Spectrum, Standard: EN 301 908-1, EN 301 908-2 V6.2.1, EN 301 908-13 V6.2.1
- Electromagnetic Compatibility EMC 2014/30/EU Annex II (Standards: EN 55032:2015, EN 61000-3-2: 2014, EN 61000-3-3: 2013, EN 55024: 2010+A1: 2015)
- Low Voltage Directive LVD 2014/35/EU (Standards: EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013)

The Encoder contains a radio module that has been approved for integration into fixed and mobile applications. In order to satisfy the requirements for integrating the radio module the unit is compliant with the following standards:

- Health and Safety (Art 3(1) (a)): EN 62368-1: 2014, EN 62311:2008
- EMC (Art.3(1) (b)): EN 201 489-1 v2.2.0 (draft), EN 301 489-17 v3.2.0 (draft)
- Spectrum (Art.3(2)): EN 300 328 v2.1.1, EN 301 893 v2.1.1
- RoHS2 Directive 2011/65/EU: EN 50581:2012

The use of this product may be dangerous and has to be avoided in the following areas:

- Where it can interfere with other electronic devices in environments such as hospitals, airports, aircraft, etc.
- Where there is risk of explosion such as gasoline stations, oil refineries, etc.

The user must ensure that:

- The antenna(s) used with the EdgeVis HD-IP470 unit must be installed to provide a separation distance of at least 20cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter
- The antenna(s) used with the EdgeVis HD-IP470 unit must conform to the requirements stated in the installation guide
- The EdgeVis HD-IP470 unit shall only be used for fixed and mobile applications

It is responsibility of the user to enforce the country regulations and specific environment regulations.