Redvision™

Gen 3 X-Series PTZ Models

Installation Guide

Generation 3 Rugged IP & Hybrid PTZ cameras

This Guide covers these products:

RVX2/ X3/ X4 IP PTZ (Feb 2020>)

RVX2 PSU (Feb 2020>)

Hybrid Models (Feb 2024>)

RV-HYB-PSU Hybrid (Feb 2024>)

PoE 802.3bt Midspan variants

Quick guide on page 4!

ONVIF Member

Proud UK Design and Manufacture-----UK Service and Support

V1.8 March 2024

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Welcome to Redvision

Thank you for choosing a Redvision rugged IP PTZ camera. Your camera has been carefully developed and manufactured in the United Kingdom as a leading-edge, precision-technology surveillance camera, offering superb image quality, excellent low-light performance, combined with powerful lighting options. Your camera has been designed to be maintenance-free and able to operate in a wide variety of environments and applications.

This guide is intended to cover the basic installation of your camera, up to and including accessing the internal web server. A separate guide "**Redvision Web User Guide**" is available online at www.redvisioncctv.com for a detailed insight into configuring the many functions and options in your rugged IP PTZ camera.

Contents

i. Quick-Guide for to essential configuration:

Your camera uses a built-in web server, to allow configuration from any web-browser application.

The camera contains the following settings as a factory-default configuration:

Supported Web Browsers	**Edge**	Optimised for Microsoft® Edge®
	Chrome	
	Firefox	
	Basilisk	
	Opera	
IP Address	DHCP/ 192.168.0.120	Camera will look for DHCP address on boot-up, if no DHCP present, camera will assign itself this fixed IP address. Your computer must be set to same IP range to connect to the camera (example: 192.168.0.254)
Stream 1	H.264, 1920x1080p,25fps, CBR 4Mbps	H.265 & MJPEG options available
Stream 2	H.264, D1, 25fps, CBR, 1.5Mbps	
Stream 3	H.264, CIF, 25fps, CBR, 256kbps	
ONVIF Port	80	Configurable
RTSP Port	554	
Login Credentials	admin/admin	
Camera orientation	Hanging	

Connecting to the camera:

Your camera will automatically get an IP address from a DHCP server if one is connected to the network. If not; the camera will configure a temporary fixed IP address of **192.168.0.120** so you can communicate with it. **Your computer must be set to operate in the same IP address range, so it can connect to the camera**. Use one of the above listed web browsers to access the camera's web interface. The cameras have been optimised for use with Microsoft Edge browser.

NOTE: **Microsoft will end Internet Explorer browser from June 2022**. The following X-Series firmware versions all support multi-browser operation:

PTZ Model	Firmware version*	Release Date
X2 COMBAT	v3.6.0804.1004.161.0.15.**8.7**	26/01/2022
X3 STORM	v3.6.0804.1004.161.0.15.**8.9**	20/03/2022
X4 COMMANDER	v3.6.0824.1004.161.0.13.**2.8**	18/02/2022

*Firmware versions higher than those listed above support multi-browser operation.

Please contact Redvision Technical Support on +44 (0) 1420 448 448 or techsupport@redvisioncctv.com to request latest firmware.

Login via web browser

Type the camera's IP address into the web browser address bar; e.g. 192.168.0.120 and press enter.

The login page is displayed, as shown below.

- Enter the username and password.
- The default user name is **admin**. The default password is **admin**. Change the password when you log in to the system for the first time to ensure system security.
- You can change the system display language on the login page.
- Click  to proceed. The main page is displayed.

Main Page Layout

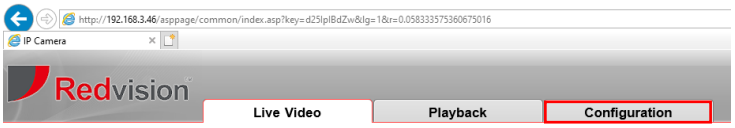
From the main page, you can view live images, set PTZ parameters, access the main configuration menus, change the password, and log out of the system. For detailed configuration help, please read the Web User Guide for Gen 3.0 products (available at www.redvisioncctv.com) Fig 1 below shows the main page layout.

Fig 1. Main page layout (Edge browser shown in example)

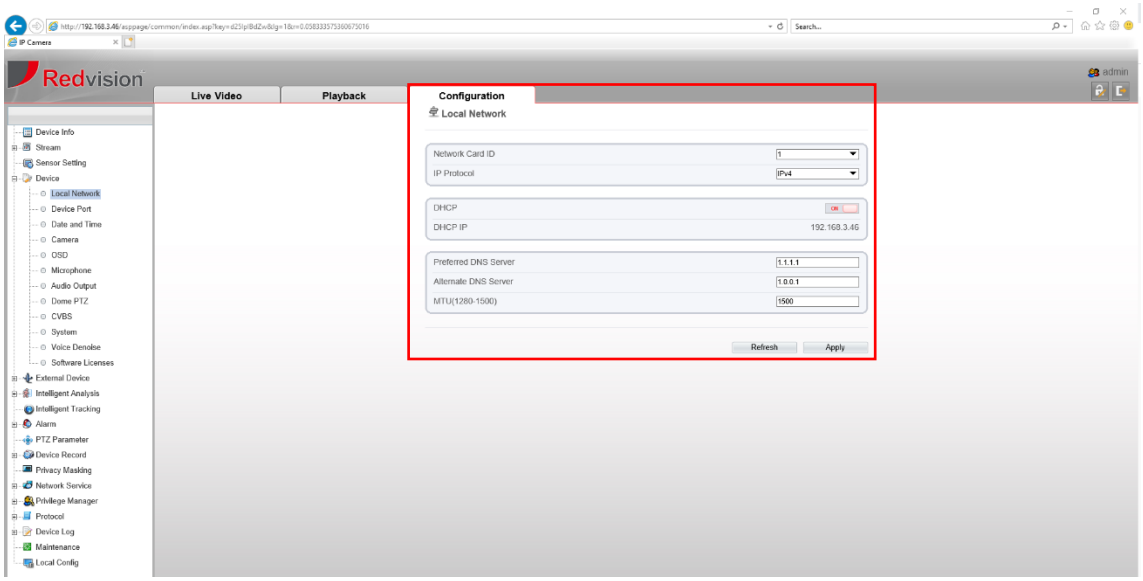
Setting a new fixed IP address

The camera has been shipped with a static IP address of **192.168.0.120**. This will need to be changed to match the IP address range of your network. If you are using a DHCP server on the network, the camera should request and assign an IP address from the DHCP server automatically.

- From the Web interface live screen, click the **Configuration** tab (you will need user administrator privileges to do this).

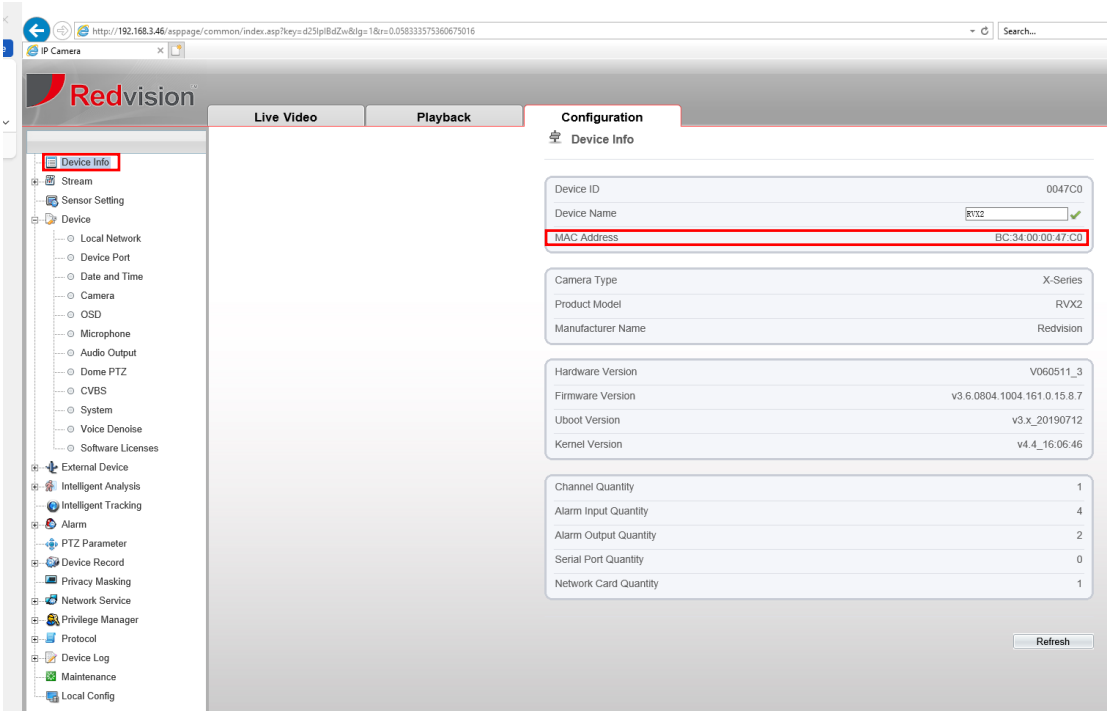


- Using the menu tree on the left-hand side; click Device, then Local Network:



- Choose TCP/IP v4 or v6 as required; type the new fixed IP address of the camera into the IP Address field; with Subnet Mask and Default Gateway address (if connecting exclusively to an NVR; use the NVR's fixed IP address for the Gateway). Set DNS addresses if outbound/ internet access is required. MTU setting: Most LAN networks will accept the default setting of 1500; however, for outbound/ internet access; Routers may require a setting of 1492 or lower. Check with the Network Administrator or Internet Service Provider (ISP) for the correct figure.
- Click APPLY when finished. Wait for 90 seconds for the camera to reboot and apply the new fixed IP address.
- You will need to connect to the camera using the new IP address now.
- DHCP: On by default, turn off to set fixed IP address. Only enable the DHCP button if you wish the camera to acquire an IP address automatically from the network's resident DHCP server. Typically, you will need to agree a range of reserved DHCP address with the Network Administrator beforehand. You may need the MAC address of each camera in advance. This can be found on the Device Info page at the top of the menu tree:

MAC address location on Device Info page:



IMPORTANT NOTE! We strongly recommend setting the camera's time and date, with NTP server if possible. This will help with future support issues such as forgotten password etc. Go to: Device>Date & Time and configure.

Configuring the system in more detail is now possible. For detailed help with the camera configuration, please refer to the Web-Interface User Guide, available at: www.redvisioncctv.com

ii. Safety guide

THIS CAMERA SYSTEM MUST BE INSTALLED, OPERATED AND MAINTAINED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.

1. Installation of this system should be carried out by suitably trained and qualified technicians in accordance with local electrical codes.

2. To prevent the risk of electric shock do not expose the electrical connectors on the camera or the inside of the control box to water before or during installation. Condensation/ misting may occur if water is allowed to enter the housing before power is applied.

3. Do not drop the product.

4. Avoid the use of alcohol or solvent-based cleaners. The X2 and X4 models should be cleaned with clean water and non-abrasive material.

5. The camera system should be installed where it cannot be tampered with by unauthorised personnel.

6. The products should be securely fastened to a structure of sufficient strength to support it. Allowance should be made for additional loads caused by local wind effects.

7. This camera has been manufactured with passive moisture-removal measures, to protect the camera during shipping/ transit. Do not remove the rear screwcap (if fitted) at any time; this is for factory access only. For best results, it is recommended once installed, that the camera be powered as soon as possible, to allow the internal heater and fan devices to operate. It is not recommended to leave the camera in storage or unpowered for extended periods of time.

iii. Identifying your camera

The 2020 X-Series range consists of three primary models:

X2 COMBAT™:

- 30x optical zoom, 3MP low-light camera module.
- ONVIF Profile S, G, Q Compliant
- Alloy housing with marine grade finish and parts.
- Integrated long-life Silicone Wiper.
- Long-range IR and white light options.
- 180°/s pan speed, 90°/s tilt speed.
- 101.6mm (4”) PCD base.
- Cantilever Arm function to allow view of tower base.
- PoE Ultra (802.3bt) Midspan variant available.

X3 STORM™:

- 30x optical zoom, 3MP low-light camera module.
- ONVIF Profile S, G, Q Compliant
- Fully Stainless-Steel 316L housing and parts.
- High-Power motors.
- Integrated long-life Silicone Wiper.
- Long-range IR and white light options.
- 50°/s pan and tilt speed.
- 101.6mm (4”) PCD base.
- PoE Ultra (802.3bt) Midspan variant available

X4 COMMANDER™:

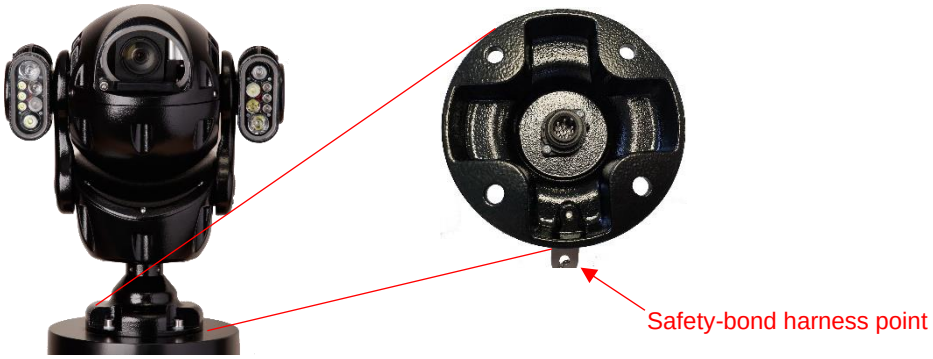
- 37x optical zoom, 2MP Starlight camera module.
- ONVIF Profile S, G, Q Compliant
- Alloy housing with marine grade finish and parts.
- High-Power motors.
- Integrated long-life Silicone Wiper.
- Super range IR and white light options.
- 180°/s pan speed, 90°/s tilt speed.
- 101.6mm (4”) PCD base.
- Cantilever Arm function to allow view of tower base.
- PoE Ultra (802.3bt) Midspan variant available.

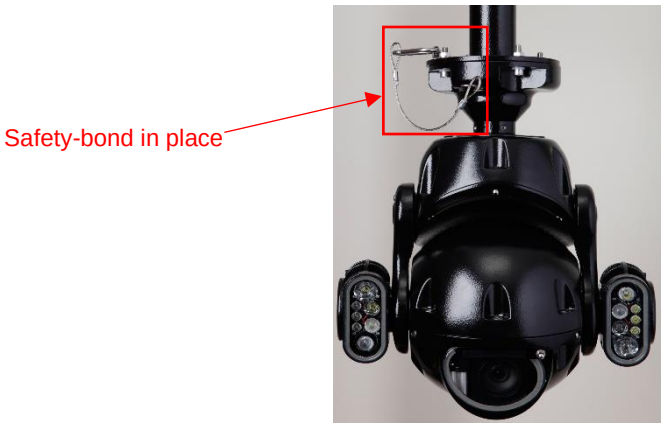
1.0 Installing the camera head

Your camera is supplied with an industry-standard 4” PCD base, for mounting directly onto poles, towers and brackets using a compatible 4” PCD mount (shown below in Fig. A). The base provides a secure eyelet for attaching the supplied Safety-Bond.

Ensure the Safety-Bond is securely fitted at all times.

Fig. A PCD Direct-Mounting base (X2 COMBAT shown as example):





1.1 PTZ configuration – converting hanging camera to upright camera mode

Your camera can be mounted as a hanging dome or upright PTZ configuration. The default configuration is **Hanging**. To convert the camera to upright PTZ, simply invert the camera onto an upright PCD mount, then change the **Install Mode** setting in the **PTZ Parameter** page, in the camera’s web interface (see separate Web User Guide).

Fig. B Correct Mounting orientations

OBSERVE THE FOLLOWING PRECAUTIONS WHEN INSTALLING:

1. Mount the Camera in a position where it cannot be interfered with either intentionally or accidentally.
2. The mounting surface should be capable of supporting the weight of both the Camera and mounting brackets under all expected conditions of load, vibration and temperature.
3. The mounting brackets should be fitted in accordance with instructions and should observe all appropriate safety precautions & local building regulations.
4. Ensure the Camera is in the correct orientation, see **FIG B** above.

EMC Information

WARNING: THIS IS A CLASS A PRODUCT. IF INSTALLED IN A STATIC ENVIRONMENT, RADIO INTERFERENCE MAY BE CAUSED, IN WHICH CASE THE USER MAY BE REQUIRED TO TAKE ADEQUATE MEASURES TO PREVENT IT.

1.2 Bracket installation

Bracket installation:

Fixings to the various bracket types will depend on the fixing surface. It is important to use adequate quality fixings to safely support the complete camera assembly. Fixing holes on the 4" PCD provide adequate clearance for **M8** bolts.

Mounting the camera correctly:

It is important to choose the correct brackets/ mount for the camera. Consider the camera's orientation before ordering brackets. i.e. is the Camera hanging down or upright?

For hanging operation, use one of the following brackets:

- **Swan bracket**
- **Wall bracket**
- **Standoff Bracket**
- **4" PCD-compatible mount**

For upright operation, use one of the following brackets:

- **Standoff Bracket**
- **Wall bracket**
- **4" PCD-compatible mount**

The existing RV-CNR and RV-POLE brackets are compatible with your camera

ALWAYS USE THE SUPPLIED SAFETY-BOND!!

1.21 IMPORTANT! Mounting the X3 STORM™ model:

The X3 STORM™ camera is manufactured from 316 Stainless Steel. It is important that the supplied mounting gasket (4”/101.6mm PCD) is fitted between the camera’s PCD mounting base and the mounting plate of the tower/pole/bracket. The same should be applied when mounting the Stainless-Steel Standoff bracket. Premature surface corrosion or staining could occur if this information is not followed.

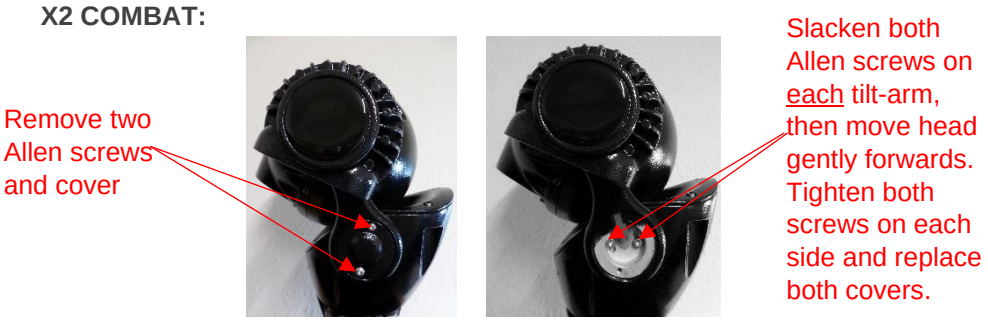
Example: 4” (101.6mm) PCD Gasket, must be fitted between camera base and bracket mount surface.

1.3 Cantilever Mode - Moving the tilt-arms forwards (X2 and X4 Models only)

Your camera is able to cantilever the camera head forwards by approx. 15°, in order to see the base area of a tower or pole clearly. In effect, this gives the camera the ability to view a full 180° in the tilt axis, ensuring nothing is missed. Moving the camera head into Cantilever mode is easy, simply:

1. Remove the two fixing screws and alloy covers at the base of each tilt-arm, using the supplied Allen-key
2. Slightly loosen the two Allen-screws on each tilt-arm
3. Move both tilt-arms forward to “STOP”
4. Tighten both Allen screws on each tilt-arm
5. Re-fit the alloy covers in place, with the hump protruding outwards
6. Once in camera setup, navigate to Configuration Tab>PTZ Parameter>Install Mode and set “Upright, Arms Out” mode and apply the setting.

X2 COMBAT:



X4 COMMANDER:

Note: X3 STORM does not have Cantilever function.

2.0 Power supply installation & setup (IP-only & Hybrid models)

WARNING & SAFETY NOTICE: DISCONNECT ALL POWER BEFORE OPENING OR WORKING ON THE POWER SUPPLY UNIT. INSTALLATION MUST BE CARRIED OUT BY A SUITABLY QUALIFIED PERSON

The camera warranty is void unless it is installed using a Redvision power supply unit (PSU) and a Redvision supplied umbilical/multicore lead (Composite cable). Using the wrong type of 3rd party PSU could compromise safety and damage the camera unit.

UMBILICAL CABLE: A pre-made composite cable with connector must be purchased with all Redvision cameras. The female connector connects directly to the male connector on the base of the Camera housing.

- Mount the Redvision PSU in a position so it cannot be interfered with intentionally or accidentally. Ideally use a lockable cabinet.
- Securely fix the Redvision PSU using appropriate size screws and ensure the cable glands have sufficient clearance to allow the cables to enter.
- Ensure cable glands face downwards at all times, and securely tightened.
- All cables should be channelled through the appropriately sized gland holes.
- Only use Redvision supplied umbilical/multicore cables for connecting the PTZ camera and Redvision PSU. Warranty will be void if these cables are extended between the camera and PSU. Extending cables could also compromise safety. Contact Redvision Technical Support if in doubt.

NOTE: If using a PSU and 24VDC model camera, do not connect the camera to a PoE network source! Non-PoE cameras are not intended for use with PoE Ethernet sources (such as PoE injectors or PoE network switches). Damage may occur when connected to both 24VDC and PoE sources!

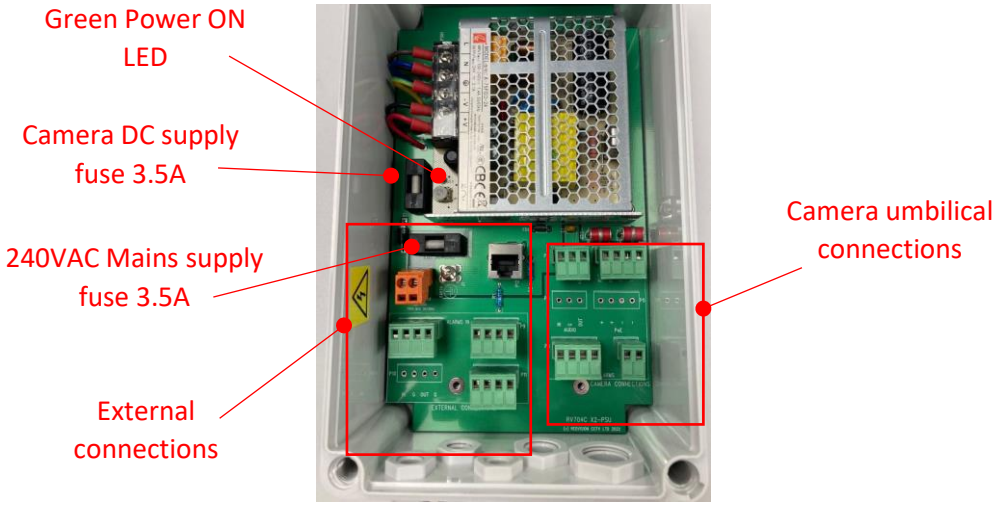
Follow the colour coding idents as shown in the table on page 13 for terminating the umbilical/multicore cable in the power supply.

2.1 Power supply specifications

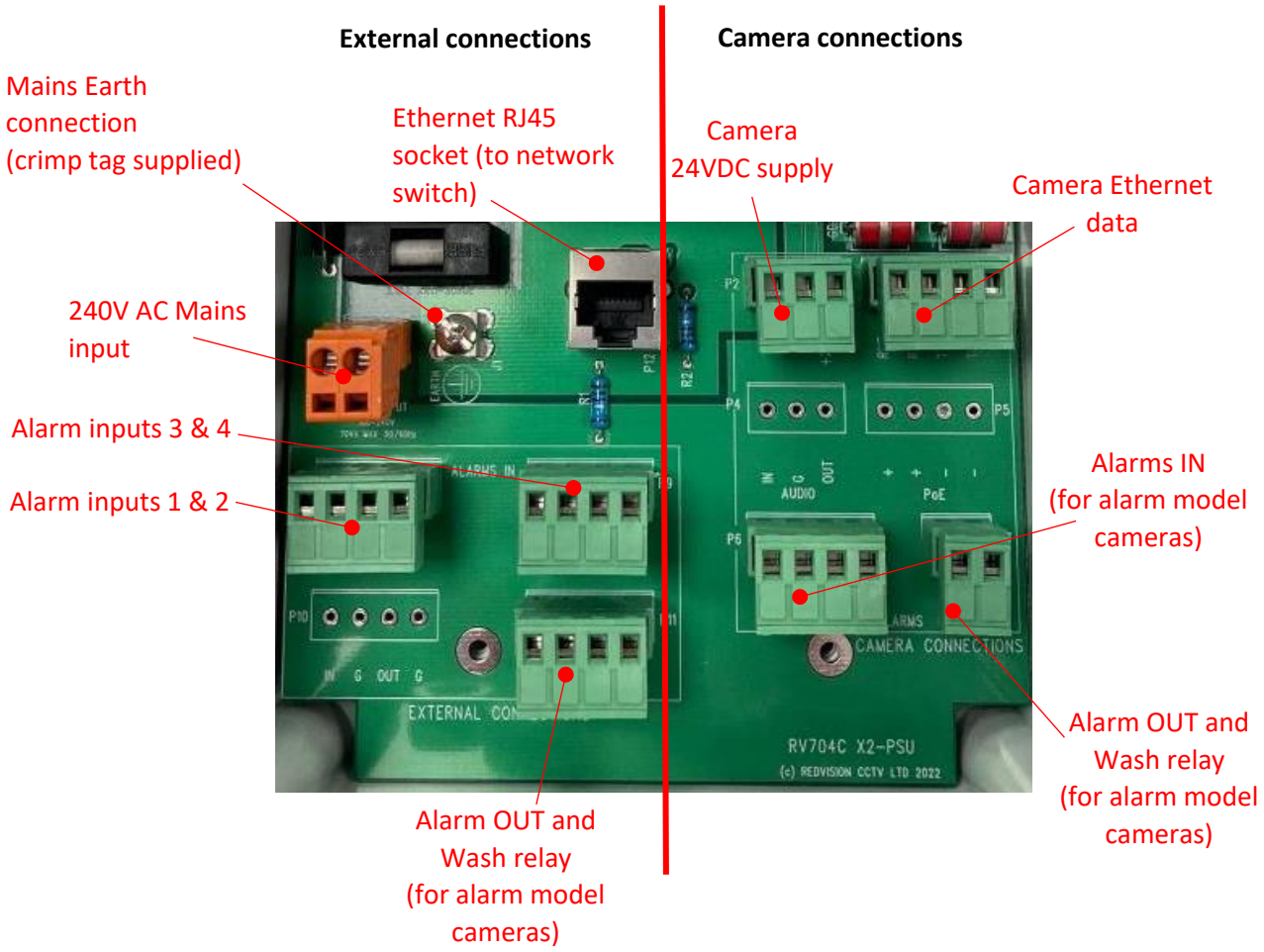
Mains PSU versions:	
Power input voltage range	90-260 VAC
Frequency range	47Hz~63Hz
Output Voltage	24VDC
Max. output current	3.1A
Max. output power	75W
Operating temperature range	-40°C~60°C
PoE versions:	
Power Input Voltage Range:	48V~57V DC
PoE Standard:	802.3bt Midspan device
Power rating:	LED Models: 90W
	Non-LED Models: 60W
Connection:	RJ45 8-pin Ethernet Socket

2.2 Power supply layout (IP-only models)

The Redvision power supply outputs 24V DC and is supplied with an IP67 rated ABS junction box.



2.3 PSU connections (IP-only models)



2.4 Mains power connections (P1) (IP-only models)

PCB IDENT	MAINS POWER
L	LIVE (BROWN) 110/230 VAC Connection via 2-way terminal block
N	NEUTRAL (BLUE) Connection via 2-way terminal block
EARTH	GREEN/YELLOW Connection via terminal screw

NOTE: Earth connection requires a 4mm red spade loop (supplied with PSU) to be fitted at the time of installation. The Earth connection MUST be used.

SAFETY: ENSURE MAINS INPUT & EARTH CONNECTIONS ARE SECURELY STRAIN RELIEVED.

2.5 Fuses

PCB IDENT	DESCRIPTION
FS2	Mains input fuse T3.15A - Anti Surge
FS1	Camera fuse 3.15A - Fast Blow

2.6 Primary network connection (IP-only models)

RJ45 SOCKET

The socket is a typical Ethernet 10/100BASE-T type, for connection of a Cat 5e cable, wired to the T568A or T568B scheme.

The camera supports automatic polarity and automatic crossover (Auto MDI/MDIX) to simplify installation cabling.

The use of high quality, solid-copper Ethernet cable is highly recommended for reliable operation. Ensure that any Ethernet cable has a comfortable arc-radius when inside the PSU box.

RJ45 Umbilical models (24VDC) connector wiring:

PIN No.	PCB IDENT	WIRE COLOUR
1	TxP	White / Orange
2	TxN	Orange
3	RxP	White / Green
4	-	Blue
5	-	White / Blue
6	RxN	Green
7	-	White / Brown
8	-	Brown

2.6.5 Power over Ethernet (PoE) Versions (IP-only models)

RJ45 SOCKET connections

The PoE version of the camera is a fully 802.3bt 90W-compliant device. It is factory-fitted with a single RJ45 socket, which will accept both Ethernet data and power. Please ensure you follow standard Ethernet wiring conventions when connecting to the camera, or damage could occur.

Detail: **Non-LED** cameras can be powered by a **60W** PoE 802.3bt Midspan source, due to the lower power requirement. IR and white light models are **class 8 PoE devices** and therefore require a **90W** PoE 802.3bt Midspan source, typically a PoE Injector block. **Ensure you connect the camera to the appropriate power source! Do not connect to a lower-power-rated PoE device or damage may occur!**

Using the PoE variant:

1. The camera must be powered by an **802.3bt Midspan** compliant PoE supply (also known as PoE Ultra, PoE++). Please ensure that a suitable Midspan injector is used (Redvision model is available). The camera uses power on non-data pairs in the Ethernet line (Mode B operation). To connect, simply connect an 8-wire Ethernet cable, with RJ45 plug onto the mating socket, on the base of the camera. The camera has been wired to Ethernet standard T568A, connections are shown below.

2. The camera uses the following wiring standard: T568A, 10/100 Mode B:

PINS on Switch	T568A Color	10/100 DC on Spares (mode B)
Pin 1	white/green stripe	Rx +
Pin 2	green solid	Rx –
Pin 3	white/orange stripe	Tx +
Pin 4	blue solid	DC +
Pin 5	white/blue stripe	DC +
Pin 6	orange solid	Tx –
Pin 7	white/brown stripe	DC –
Pin 8	brown solid	DC –

PoE PD is Class 8

The camera will also work on T568B wiring and auto-negotiate with switches/ injectors. The camera has been designed to operate on an appropriate 802.3bt Midspan PoE supply, over maximum 100m Cat5e span. **Ensure that that any power sources are capable of working at this power over this distance.**

An IP67, weather-resistant cable-shroud is provided with the camera. This covers and protects the Cat5e cable and when mated with the RJ45 socket on the base of the camera, forms a complete IP67-rated connection.

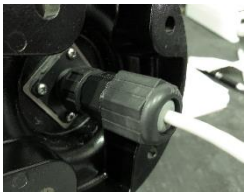
This connector must be used at all times, camera warranty may be invalidated otherwise.

Cable-end shroud components

nly

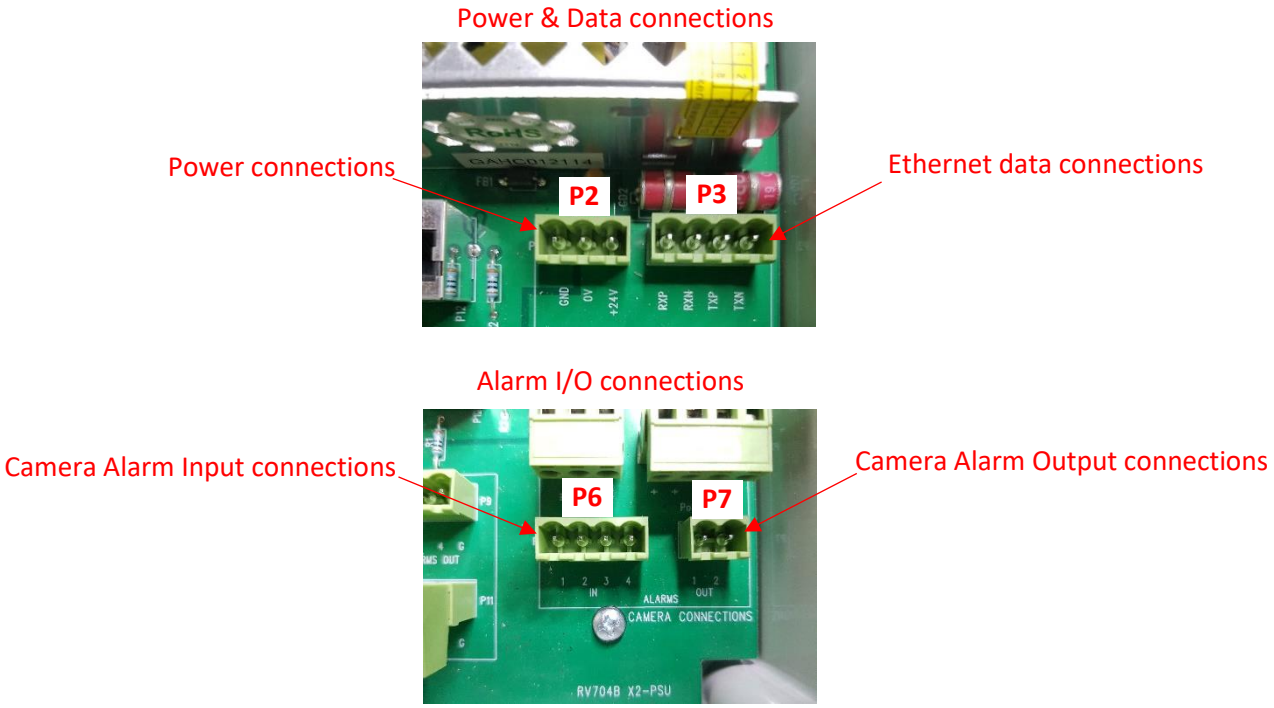
Assembled

Complete assembly



Two types of umbilical cable are supplied, dependent upon the camera model used. The Standard camera uses a 7-pin Amphenol connector, the Alarm model uses a 14-pin Amphenol connector, with additional wires for the alarm signals. The wiring table below covers both types of connectors. Each function is clearly labelled on the circuit board, below the appropriate connection.

The wires terminate in the following connector blocks on the PSU circuit board:



Follow the colour coding idents as shown in table below for terminating the umbilical lead in the power supply (connections as viewed L~R):

Camera type	WIRE COLOUR	SIGNAL	PSU Connector	Pin
Standard Model	Drain wire	Camera chassis Earth	P2	GND
	Black	0V DC Power	P2	0V
	Red	24V DC Power	P2	+24V
	Blue/White	Camera Rx+ Ethernet	P3	RXP
	Blue	Camera Rx- Ethernet	P3	RXN
	Orange/White	Camera Tx+ Ethernet	P3	TXP
	Orange	Camera Tx- Ethernet	P3	TXN
Alarm Model (in addition to above)	White/Red	Alarm IN 1	P6	1
	White/Yellow	Alarm IN 2	P6	2
	White/Grey	Alarm IN 3	P6	3
	White/Black	Alarm IN 4	P6	4
	Pink	Alarm OUT 1	P7	1
	Green	Alarm OUT 2 (Wash relay)	P7	2

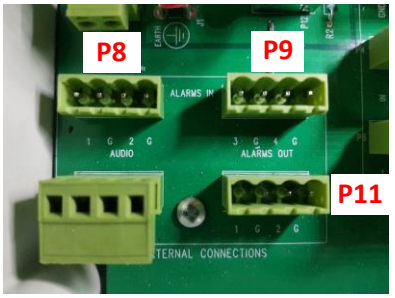
2.8 External Alarm connections (for alarm-capable models only) (IP-only models)

Connections are provided for external alarm signals from PIRs, door contacts, or other, voltage-free opening or closing contacts.

Note: Alarm inputs are “Dry”, designed to be voltage-free. **Damage may occur and the warranty void if voltage is applied to the alarm input contacts!**

NOTE: The 'Alarm input xx Ground' connections are all common on the PCB and connected to the PSU 0V line.

External Alarm Inputs



External Alarm Inputs

Connector	Pin	Signal
P8	1	Alarm IN 1 Signal
	G	Alarm IN 1 Ground
	2	Alarm IN 2 Signal
	G	Alarm IN 2 Ground
P9	3	Alarm IN 3 Signal
	G	Alarm IN 3 Ground
	4	Alarm IN 4 Signal
	G	Alarm IN 4 Ground

2.9 Alarm outputs (for alarm-capable models only) (IP-only models)

One 4-Way pluggable screw terminal block connector provides two NO/NC alarm output contacts (ALARM / WASH). The contacts are “Dry”, designed to be voltage-free and can be used to switch auxiliary devices on/off. **An external, 3rd-party relay switch must be used to switch current to operate a secondary device. Contact Technical Support for further details.**

The alarm contact operation can be defined in the camera’s web setup (please see separate Web Setup Guide).

External connections:

Pin	P11
1	Alarm Out 1 Signal
G	Alarm Out 1 Ground
2	Alarm Out 2 Signal
G	Alarm Out 2 Ground

3.0 Hybrid PSU

Introduction to Hybrid cameras

Hybrid models retain all the functionality and connectivity of an IP camera, but with added analogue video (CVBS) and RS485 (Pelco protocol) connectivity. This allows an IP camera to be installed onto a legacy, analogue system, using traditional coaxial video cable (RG-59 or better) and twisted pair data cable (Belden standard). The camera operates under the analogue system, until the system is upgraded to a fully-IP infrastructure. At which point, the analogue side becomes unused, and the IP side now in operation. Both analogue and IP connections can exist and operate simultaneously. Cable distances vary, but 100m should be achievable, using RG-59 cable, greater distances with lower-loss cables (such as RG-11 or RG-6). RS-485 data is designed for daisy-chain topology, with a maximum limit of 1200m, using the correct Belden-grade twisted pair cable.

All settings are configured via the camera's Ethernet port, using a computer and web browser access.

The camera responds to Pelco protocols D & P, with Camera ID, Baud Rate, Parity & Stop Bit settings configurable in the camera settings.

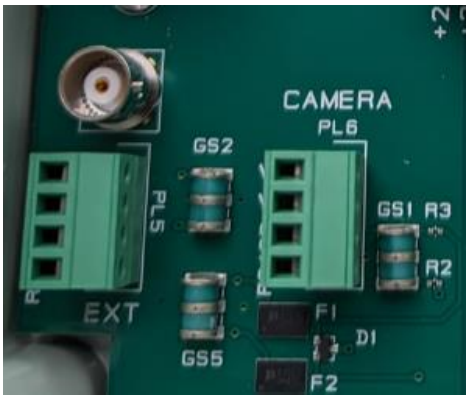
A BNC test point (SK1) is provided for easy verification of analogue video at the Power supply connection point. An analogue video (CVBS) test monitor is required to use this feature.

Signal specifications:

Analogue Video:	CVBS, 1V Pk/Pk
PTZ Control Data:	RS-485 (DATA A & B), Pelco D & P protocols, selectable Baud Rate, Parity/ Stop bit

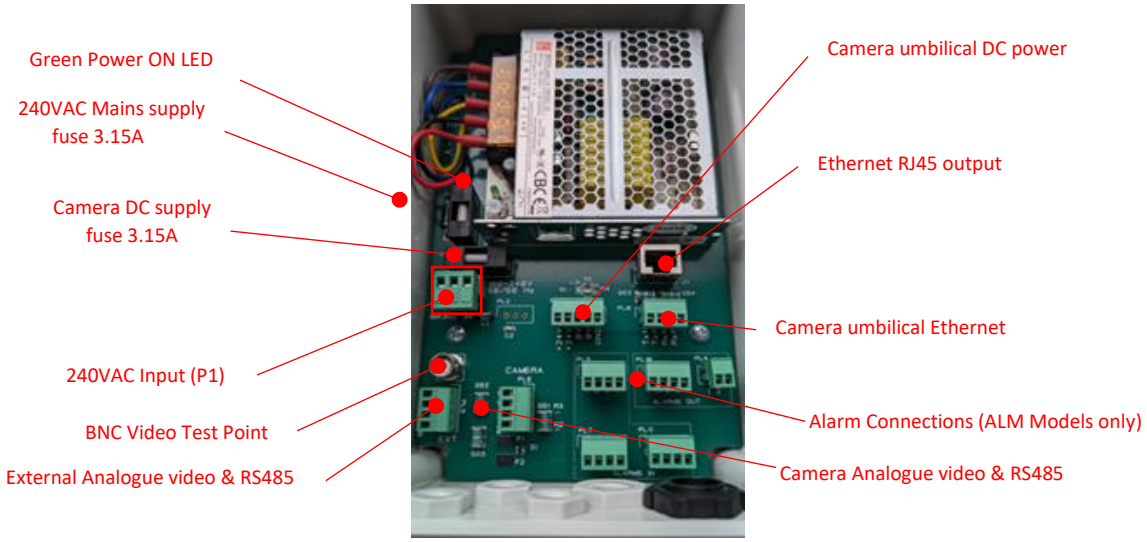
Note: Ensure that any existing cables are fully tested and in good working order, or performance may be degraded!

Example: External and Camera connections for Analogue Video, RS-485, (showing protection circuitry)



3.1 Power supply layout (Hybrid models)

The Redvision power supply outputs 24V DC and is supplied with an IP67 rated ABS junction box.



3.2 Mains power connections (Hybrid models)

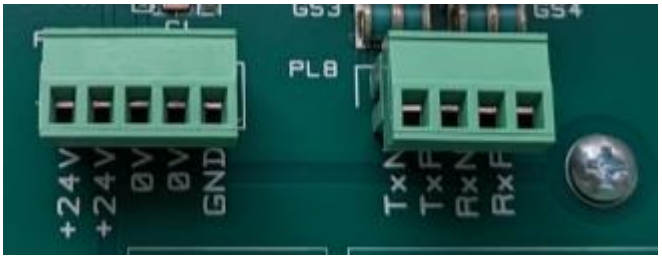
Electrical Connections

MAINS INPUT 100-240V AC 50/60Hz

Input Power Connections (PL1)		
PCB ID	**Colour**	**Function**
L	Brown	Mains Live Connection
N	Blue	Mains Neutral Connection
E	Green/Yellow	Earth Connection

SAFETY: ENSURE MAINS INPUT AND EARTH CONNECTIONS ARE SECURELY STRAIN RELIEVED.

3.3 Camera Umbilical connections (Hybrid models)

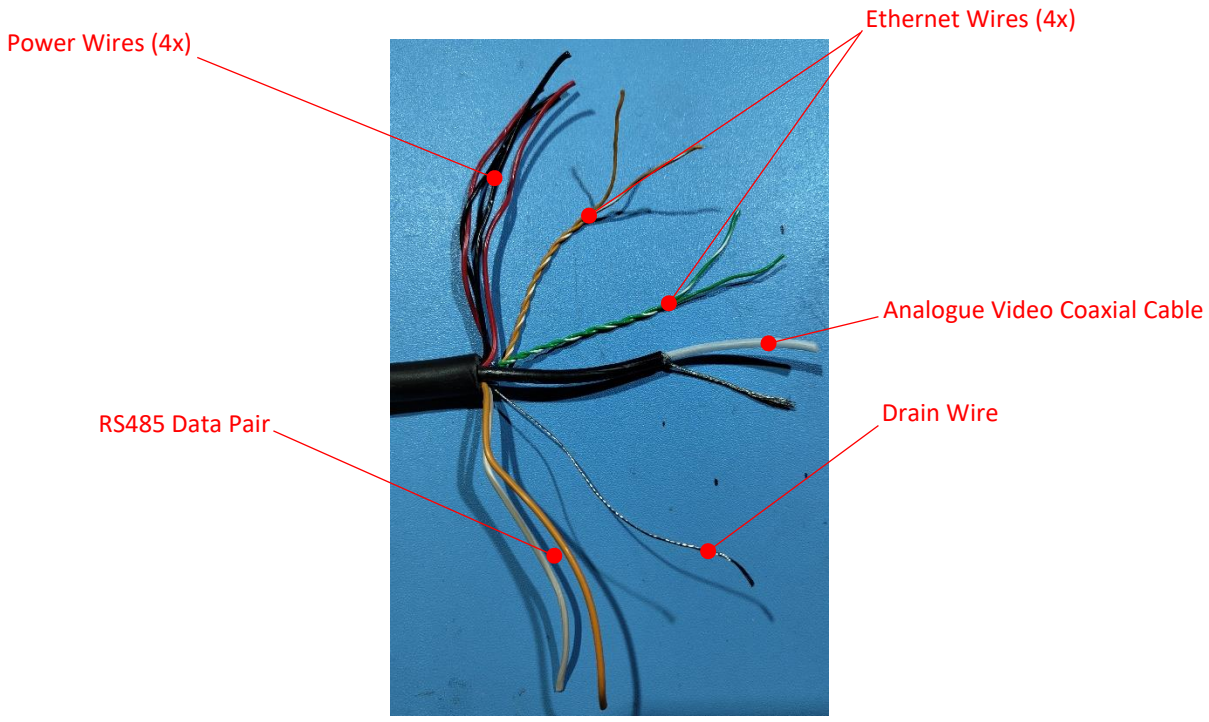


Note: Ethernet wire polarity and colours (different to IP-only models)

Camera Connections (PL3, PL6, PL8)

Connector	Ident	Wire Colour	Signal
PL3	+24VDC	Red	Camera +24VDC
(Read L~R)	+24VDC	Red	Camera +24VDC
	0V	Black	Camera DC GND
	0V	Black	Camera DC GND
	GND	Drain Wire	Camera Chassis GND
PL8	TxN	Orange	Ethernet Data TX-
(Read L~R)	TxP	Orange/White	Ethernet Data TX+
	RxN	Green	Ethernet Data RX-
	RxP	Green/White	Ethernet Data RX+
PL6	RS485A	White	RS485A
(Read L~R)	RS485B	Orange	RS485B

Camera Umbilical Cable layout



3.4 External connections (Hybrid Models)

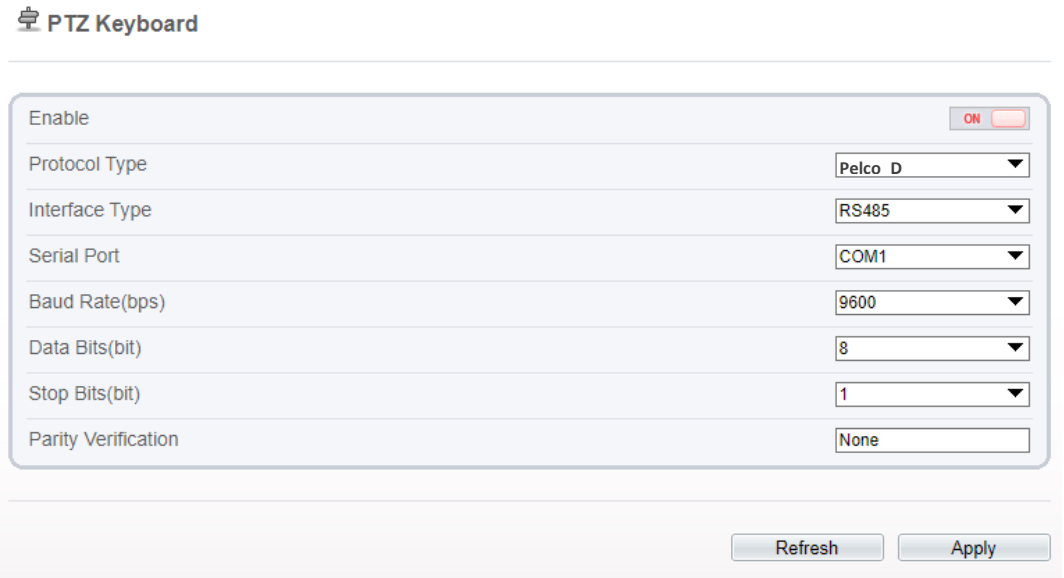
3.4.1 Analogue Video and RS485 PTZ control (PL5)

Ident	External
VID	Coax Signal (BNC SK1)
VIG	Coax Screen
RS485A	RS485A
RS485B	RS485B

3.5 Configuring the Hybrid camera (Hybrid Models)

In order to configure the Hybrid camera, first follow the Quick Guide to accessing the camera (refer to page 4 of this guide). Once logged into the camera's web interface, click the Configuration tab>External Device>PTZ Keyboard setup section.

Click the ENABLE button in The configuration pane on the right-hand side of the screen, so that it displays as ON. The RS485 control settings will be displayed:



The settings on this page need to match those of the RS485 controller, for the camera to operate correctly. Typical settings used are:

Pelco D, 9600 Baud, 8 data bits, 1 stop bit, no parity. (usually written as 9600,N,8,1).

3.6 Protocol terminology

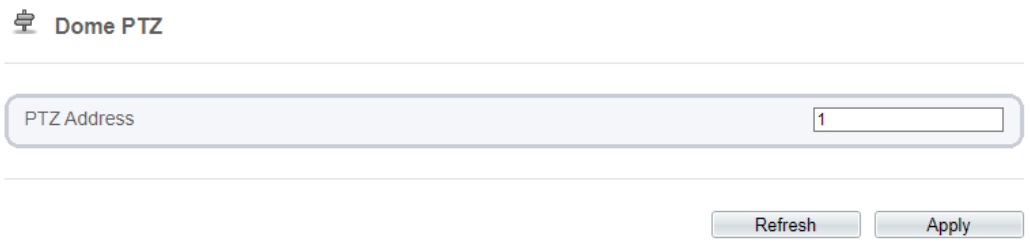
Function	Description
Protocol Type	Selects data protocol format used by the controller. Supports Pelco D & P modes. **Must match the controller setting**.
Interface Type	Serial data type (fixed at RS485)
Serial Port	Fixed at Com1
Baud Rate (bps)	Selects data speed, **must match the controller setting**. Sets between 300 and 115200 data bits per second (bps). Typical speeds used are 2400 to 9600. Slower speeds are usually more reliable, especially on longer cable runs.
Data Bits (bit)	Selects number of data bits contained with in the data packet, **must match the controller setting**. Selects between 4 and 8 bits.
Stop Bits (bit)	Sets the number of data stop bits used in the transmission. **must match the controller setting**. Sets 1 to 2 stop bits.
Parity Verification	Sets whether a Parity bit is used in the transmission. **must match the controller setting**. Typically, no parity bit is required.

3.7 Setting Camera ID

When using the camera on a daisy chain/ multi-drop bus, each camera must be uniquely addressed, so the RS485 controller can address and control each camera individually (otherwise – two cameras with the same bus address will move at the same time).

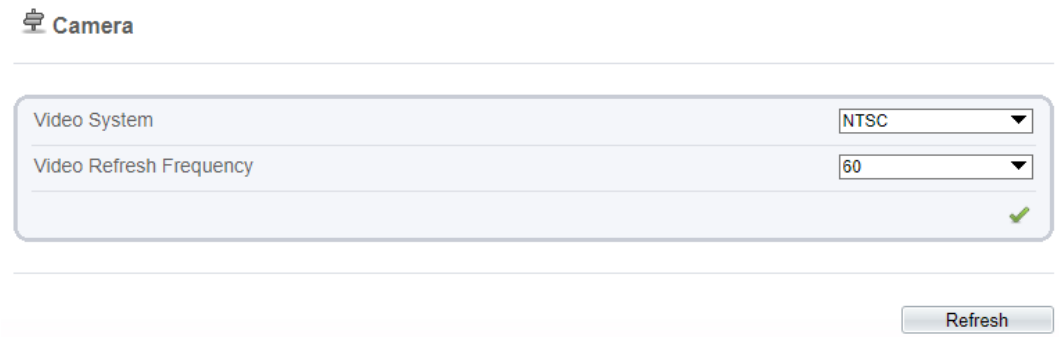
For Pelco D protocol, the maximum number of practical addresses is 254, whilst Pelco P is limited to 32. Pelco D is the most popular PTZ protocol.

To set a unique bus address, follow the quick guide to accessing the camera on page 4 of this guide, then click the Configuration tab>Device>Dome PTZ menu option. Set the PTZ address between 1 and 254, ensuring this does not clash with any other device on the RS485 bus. Click the Apply button to save the setting.



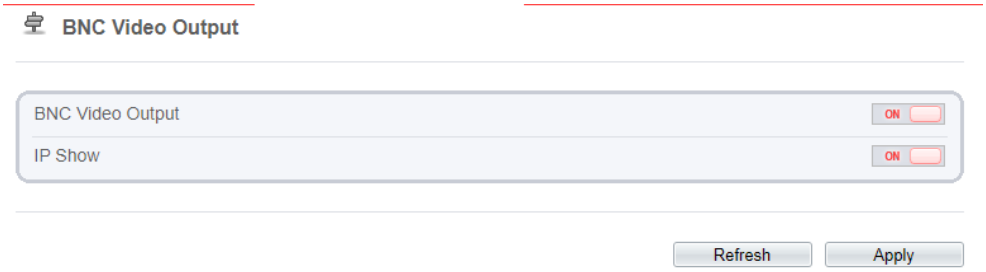
3.8 Setting PAL/NTSC video standard

The camera allows either the PAL or NTSC video standards to be used (PAL is default). To change the camera video standard, follow the quick guide on page 4 of this guide to access the camera, then click the Configuration tab>Device>Camera menu option. Change the Video System setting to NTSC, also change the Video Refresh Frequency setting to 60Hz (the typical frequency for NTSC standard). Click the green check mark to save the setting.



3.9 Turning off CVBS (analogue video) mode

When the time comes to utilise only the camera's IP network mode, the analogue video output of the camera can be disabled. To do this, follow the quick guide on page 4 to access the camera, the click the Configuration Tab>Device>CVBS menu option and click the red ON button to turn off the CVBS output. Click the Apply button to save the setting.



The IP Show option enables the camera's IP address to be displayed at the bottom of the screen. Clicking the ON button disables this feature. Click the Apply button to save the setting.

4.0 Camera setup

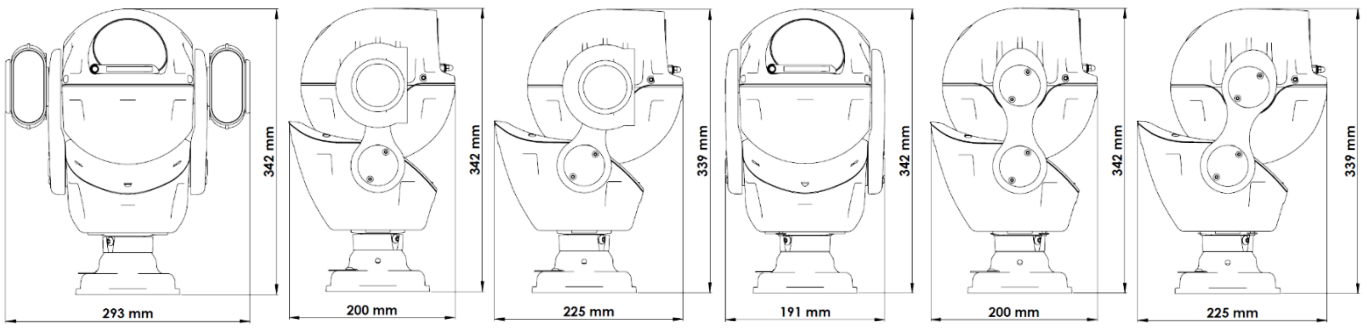
Please refer to page 4 of this manual for a quick guide to connecting to the camera. For more detailed instructions, the “Web User Guide” can be downloaded from:

https://www.redvisioncctv.com/installation-sheets/?category=x2-combat

5.0 X2S HYBRID Technical specifications

Camera	
Image Sensor	1/2.8" Progressive Scan CMOS
Effective Pixels	2592(H)×1520(V)
Electronic Shutter	Auto/Manual, 1/5 ~ 1/20,000s
Min. illumination	Color: 0.01 Lux @ (F1.6, AGC ON) B/W: 0.001 Lux, 0 Lux (IR LED ON)
S/N Ratio	55 dB
Day/Night	Auto(ICR)/Day / Night/Timing
Wide Dynamic Range	True WDR
IR On/Off Control	Auto/Manual
Lens	
Focal Length	5.3 ~ 159mm
Max. Aperture	F1.6 ~ F4.3
Angle of View	H: 55° ~ 2.3°, H: 41.6° ~ 1.7°
Optical Zoom	30x
Digital Zoom	16x
Focus Control	Auto/Manual
PTZ	
Pan/Tilt Range	Pan: 360° continuous Tilt: 150° (Cantilever function gives 180° view range)
Manual Control Speed	Pan: 0.1° ~ 180°/s, Tilt: 0.1° ~ 90°/s
Preset Speed	Pan: 180°/s, Tilt: 90°/s
Presets	400
PTZ Mode	6 Track, 12 Scan, 12 Tour (up to 32 presets per tour)
3D Positioning	Supported
Power-Off Memory	Supported
PTZ Status Display	Supported
Idle Motion	Activate Preset/ Scan/ Tour/ Track if there is no command in the specified period
Video	
Encoding	H.264 / H.265 / MJPEG / Smart Encode
Max. Resolution	4MP (2592×1520)
Streaming Capability	3 Streams
Stream/Frame Rate	Stream1: 2592×1520, 2560×1440, 2304×1296, , 1920×1080, 1280×720 @ 25/30fps Stream2: D1, VGA, 640×360, CIF, QVGA @ 25/30fps Stream3: VGA, CIF, QVGA @ 25/30fps
Bit Rate Control	CBR/VBR
Bit Rate	Stream1: 200kbps~12Mbps Stream2: 10kbps~3Mbps Stream3: 10kbps~1.5Mbps
Image Setting	HLC / BLC / Defog / WDR / Anti-shake / Brightness / Saturation / Sharpness / Contrast / Exposure Control / Scene
Noise Reduction	2D/3D DNR
Region of Interest	Off/On (8 Zone, Rectangle)
Privacy Masking	Up to 20 Masks

Network	
Protocols	IPv4/IPv6, 802.1x, HTTP, HTTPS, TCP/IP, UDP/IP, RTSP, DHCP, NTP, RTCP/RTP, PPPoE, SMTP, DNS, UPnP, FTP, ARP, SNMP, TLS/SSL, IGMP, DNS, DDNS, ICMP, QOS
Interoperability	ONVIF (Profile S, Profile G), SDK, CGI
Streaming Method	Unicast
Max. User Access	10 Users
Edge Storage	Built-in Micro SD slot, up to 256G
Web Viewer	Microsoft Windows: ≤IE11, Chrome, Firefox, Microsoft Edge MacOS: Chrome, Firefox
Analogue Connectivity	
Coaxial Video	CVBS
Telemetry	Pelco P and D
Intelligence & Alarm	
Auto Tracking	Supported
Alarm	Motion alarm, Disk alarm, Day/Night switch alarm, Network alarm, Audio abnormal alarm, Alarm push
Electrical and Physical	
Power Supply	24VDC via RVX2 PSU module; input 100~240VAC 50/60Hz. PoE Version: RJ45 socket, takes power & data (90W)
Power Consumption	24VDC: 50W. PoE: 802.3BT Midspan 90W (LED models)
Dimensions	Non-LED models: H 340mm W 191mm LED models: H 340mm W 293mm
Weight	5.2kg without lamps, 5.8kg with lamps
Operating Temperature	-40°C ~ +70°C (Light colours only, Black: 50°C)
Impact Rating	Meets IK10 standards (with Polycarbonate window fitted)
Corrosion Testing	ASTM B117 1000 hour Salt-Spray Test
Ingress Protection	Meets IP68 standards
Vibration Testing	TEN 50556:2011, clauses 6.3.2 & 11 (Table 3, Class AL2) EN 60068-2-64-2008 Test Fh
EMC	BS EN 55032:2015+A11:2020, Class A BS EN 50130-4:2011+A1:2014
Camera Body	Marine finish as standard, Aluminium, die-cast alloy, with anodised, powdercoated finish
Colour	RAL 7035 Light-Grey or RAL 9005 Black. Custom RAL made to order.
Lighting & DORI	
Illumination Range	IR (850nm) to 300m White Light to 250m
DORI Category	Distance covered
Detection	IR Light: 300m White Light: 250m
Observation	IR Light: 250m White Light: 200m
Recognition	IR Light: 150m White Light: 150m
Identify	IR Light: 75m White Light: 75m



5.0 X2S COMBAT Technical specifications

Camera Specification	
Camera module	30x optical zoom, 3MP, 1/2.8 CMOS Low-Light sensor, True-ICR
Lens	4.5mm ~ 135mm FOV: 59.8° (Wide) ~ 2.3° (Tele)
Sensitivity	Colour: 0.01Lux @ F1.2 Monochrome: 0.0001Lux @ F1.2 (AGC ON)
Shutter Speed	Auto, 1-10,000/s
Iris	Auto/ Manual
Noise Reduction	3D Digital
Image Enhancement	dWDR, BLC, HLC, Defog
Digital Image Stabilisation	Yes
P/T Range	Pan: 360° continuous Tilt: 150° (Cantilever function gives 180° view range)
P/T Speed	Pan: 180°/sec Tilt: 90°/sec
Privacy	20 Masks, individual colour choice
Preset Positions	400
Preset Tours	12
Autopan Scans	12
Mimic Patterns	6
P/T Coordinates	Yes, OSD Display

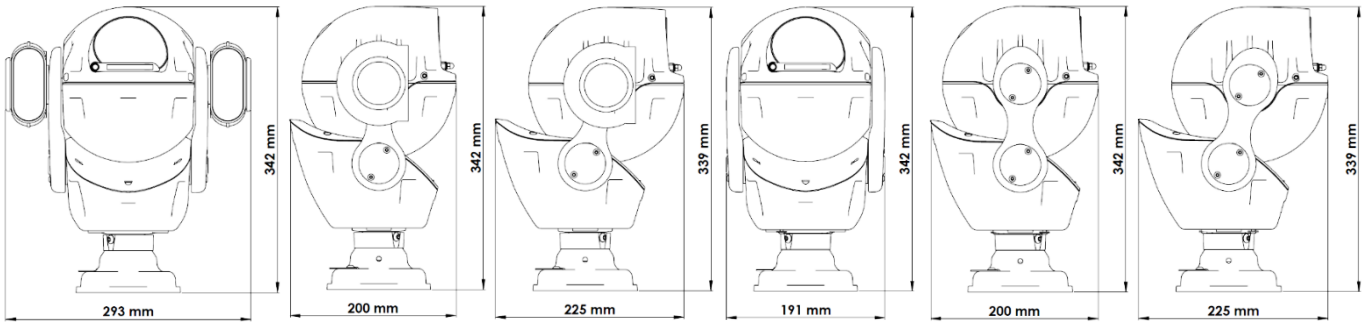
Video Streaming	
Video Compression	H.265, H.264, MJPEG
Streams	3 + Service Stream
Resolutions	Stream 1: 2048 x 1536 (3MP), 1920 x1080 (2MP), 1280 x 720 (1.3MP) Stream 2: D1, VGA, 640 x 360, CIF, QVGA Stream 3: VGA, CIF, QVGA
RTSP Video	RFC2326, Supports VLC & QuickTime
FPS	30fps max.
Bitrate	Stream 1: 500kbps ~ 12Mbps Stream 2: 100kbps ~ 6Mbps Stream 3: 100kbps ~ 6Mbps
ROI	Yes

Network Interface	
Interface	Ethernet RJ45, 10-100Base-T connection, T568A 10/100 Mode B
Supported Protocols	IPv4, HTTP, HTTPS, 802.1x, TCP, UDP, RTSP, DHCP, NTP, RTCP/RTP, PPPoE, SMTP, SNMP, DNS, UPnP, FTP, ICMP, IGMP, Unicast/ Multicast
Languages (Web interface)	English, French, Italian, Spanish, Russian
ONVIF	Profile S, G, Q
Edge Storage (optional)	256GB
Security	Base-64 authentication, HTTPS (SSL), 802.1x, IP Address Filtering

Events	
Alarm I/O	4 in, 2 out
Intelligent Motion Tracking	Yes
Event Notifications/ Actions	Email (5 recipients), FTP Upload, SD Event recording, alarm output, live stream display, mobile app push notification.
Intelligent Analytics	Perimeter, Virtual Fences, Loitering, Objects left/Removed, Speed, Illegal Parking, with scene calibration and scheduling, email recipients upon event, FTP upload, record event to SD, ONVIF event notification and video overlay.
Motion Detection	Detection grid, scheduling
System Events	SD, Network issue, ICR Switch

Electrical & Physical	
Power Supply	24VDC via RVX2 PSU module; input 100~240VAC 50/60Hz. PoE Version: RJ45 socket, Midspan, takes power & data (90W)
Power Consumption	24VDC: 50W. PoE: 90W Midspan (LED Models)
Dimensions	Non-LED models: H 340mm W 191mm LED models: H 340mm W 293mm
Weight	5.2kg without lamps, 5.8kg with lamps
Operating Temperature	-40°C ~ +70°C (Light colours only, Black: 50°C)
Impact rating	Meets IK10 standards (w/ Polycarbonate)
Corrosion Testing	ASTM B117 1000-hour Salt-Spray Test
Ingress protection	Meets IP67 standards
Vibration testing	TEN 50556:2011, clauses 6.3.2 & 11 (Table 3, Class AL2) EN 60068-2-64-2008 Test Fh
EMC	EN 55032:2015 EN55035:2017 Class A
Camera body	Marine finish as standard, Aluminium, die-cast alloy, with anodised, powder-coated finish
Colour	RAL 7035 Light-Grey or RAL 9005 Black. Custom RAL made to order.

Lighting & DORI	
Illumination Range	IR (850nm) to 300m White Light to 250m
DORI Category	**Distance covered**
Detection	IR Light: 300m White Light: 250m
Observation	IR Light: 250m White Light: 200m
Recognition	IR Light: 150m White Light: 150m
Identify	IR Light: 75m White Light: 75m



X3S STORM Technical Specifications

Camera Specification	
Camera module	30x optical zoom, 3MP, 1/2.8 CMOS Low-Light sensor, True-ICR
Lens	4.5mm ~ 135mm FOV: 59.8° (Wide) ~ 2.3° (Tele)
Sensitivity	Colour: 0.01Lux @ F1.2 Monochrome: 0.0001Lux @ F1.2 (AGC ON)
Shutter Speed	Auto, 1-10,000/s
Iris	Auto/ Manual
Noise Reduction	3D Digital
Image Enhancement	dWDR, BLC, HLC, Defog
Digital Image Stabilisation	Yes
P/T Range	Pan: 360° continuous Tilt: 150°
P/T Speed	Pan: 50°/sec Tilt: 50°/sec
Privacy	20 Masks, individual colour choice
Preset Positions	400
Preset Tours	12
Autopan Scans	12
Mimic Patterns	6
P/T Coordinates	Yes, OSD Display

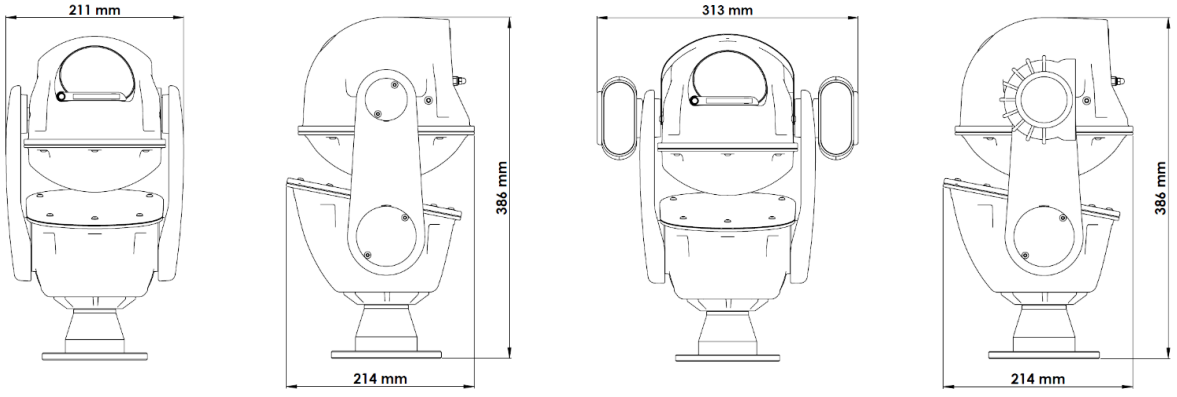
Video Streaming	
Video Compression	H.265, H.264, MJPEG
Streams	3 + Service Stream
Resolutions	Stream 1: 2048 x 1536 (3MP), 1920 x1080 (2MP), 1280 x 720 (1.3MP) Stream 2: D1, VGA, 640 x 360, CIF, QVGA Stream 3: VGA, CIF, QVGA
RTSP Video	RFC2326, Supports VLC & QuickTime
FPS	30fps max.
Bitrate	Stream 1: 500kbps ~ 12Mbps Stream 2: 100kbps ~ 6Mbps Stream 3: 100kbps ~ 6Mbps
ROI	Yes

Network Interface	
Interface	Ethernet RJ45, 10-100Base-T connection, T568A 10/100 Mode B
Supported Protocols	IPv4, HTTP, HTTPS, 802.1x, TCP, UDP, RTSP, DHCP, NTP, RTCP/RTP, PPPoE, SMTP, SNMP, DNS, UPnP, FTP, ICMP, IGMP, Unicast/ Multicast
Languages (Web interface)	English, French, Italian, Spanish, Russian
ONVIF	Profile S, G, Q
Edge Storage (optional)	256GB
Security	Base-64 authentication, HTTPS (SSL), 802.1x, IP Address Filtering

Events	
Alarm I/O	4 in, 2 out
Intelligent Motion Tracking	Yes
Event Notifications/ Actions	Email (5 recipients), FTP Upload, SD Event recording, alarm output, live stream display, mobile app push notification.
Intelligent Analytics	Perimeter, Virtual Fences, Loitering, Objects left/Removed, Speed, Illegal Parking, with scene calibration and scheduling, email recipients upon event, FTP upload, record event to SD, ONVIF event notification and video overlay.
Motion Detection	Detection grid, scheduling
System Events	SD, Network issue, ICR Switch

Electrical & Physical	
Power Supply	24VDC via RVX3 PSU module; input 100~240VAC 50/60Hz. PoE version: Rj45 socket, takes power & data (90W)
Power Consumption	24VDC: 50W PoE: 90W (LED Models)
Dimensions (H W D)	Non-Lamp models: 394 x 211 x 226mm Lamp models: 394 x 314 x 226mm
Weight	14kg without lamps, 18kg with lamps
Operating Temperature	-40°C ~ +70°C
Impact rating	Meets IK10 standards
Ingress protection	Meets IP67, NEMA 4x requirements
Vibration testing	TEN 50556:2011, clauses 6.3.2 & 11 (Table 3, Class AL2) EN 60068-2-64-2008 Test Fh
EMC	EN 55032:2015 EN55035:2017 Class A
Camera body	316L Stainless-Steel
Colour	Electropolished Stainless Finish

Lighting & DORI	
Illumination Range	IR (850nm) to 300m White Light to 250m
DORI Category	**Distance covered**
Detection	IR Light: 300m White Light: 250m
Observation	IR Light: 250m White Light: 200m
Recognition	IR Light: 150m White Light: 150m
Identify	IR Light: 75m White Light: 75m



X4S COMMANDER Technical Specifications

Camera Specification	
Camera module	37x optical zoom, 2MP, 1/2" CMOS Starlight sensor, True-ICR
Lens	6mm ~ 222mm FOV: 60° (Wide) ~ 2° (Tele)
Sensitivity	Colour: 0.001Lux @ F1.2 Monochrome: 0.0001Lux @ F1.2 (AGC ON)
Shutter Speed	Auto, 1-10,000/s
Iris	Auto/ Manual
Noise Reduction	3D Digital
Image Enhancement	dWDR, BLC, HLC, Defog
Digital Image Stabilisation	Yes
P/T Range	Pan: 360° continuous Tilt: 150° (Cantilever function gives 180° view range)
P/T Speed	Pan: 180°/sec Tilt: 90°/sec
Privacy	20 Masks, individual colour choice
Preset Positions	400
Preset Tours	12
Autopan Scans	12
Mimic Patterns	6
P/T Coordinates	Yes, OSD Display

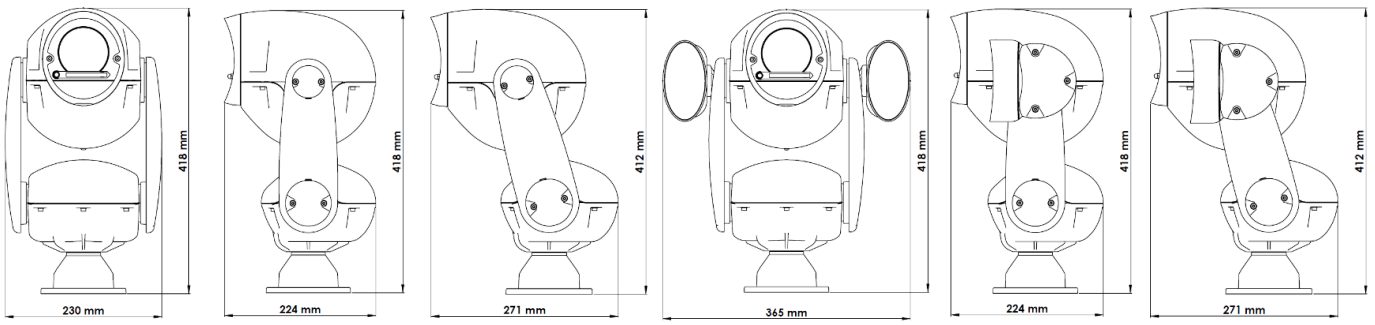
Video Streaming	
Video Compression	H.265, H.264, MJPEG
Streams	3 + Service Stream
Resolutions	Stream 1: 1920 x1080 (2MP), 1280 x 720 (1.2MP) Stream 2: D1, VGA, 640 x 360, CIF, QVGA Stream 3: VGA, CIF, QVGA
RTSP Video	RFC2326, Supports VLC & QuickTime
FPS	60fps max.
Bitrate	Stream 1: 200kbps ~ 12Mbps Stream 2: 100kbps ~ 6Mbps Stream 3: 100kbps ~ 6Mbps
ROI	Yes

Network Interface	
Interface	Ethernet RJ45, 10-100Base-T connection, T568A 10/100 Mode B
Supported Protocols	IPv4, HTTP, HTTPS, 802.1x, TCP, UDP, RTSP, DHCP, NTP, RTCP/RTP, PPPoE, SMTP, SNMP, DNS, UPnP, FTP, ICMP, IGMP, Unicast/ Multicast
Languages (Web interface)	English, French, Italian, Spanish, Russian
ONVIF	Profile S, G, Q
Edge Storage (optional)	256GB
Security	Base-64 authentication, HTTPS (SSL), 802.1x, IP Address Filtering

Events	
Alarm I/O	4 in, 2 out
Intelligent Motion Tracking	Yes
Event Notifications/ Actions	Email (5 recipients), FTP Upload, SD Event recording, alarm output, live stream display, mobile app push notification.
Intelligent Analytics	Perimeter, Virtual Fences, Loitering, Objects left/Removed, Speed, Illegal Parking, with scene calibration and scheduling, email recipients upon event, FTP upload, record event to SD, ONVIF event notification and video overlay.
Motion Detection	Detection grid, scheduling
System Events	SD, Network issue, ICR Switch

Electrical & Physical	
Power Supply	24VDC via RVX4 PSU module; input 100~240VAC 50/60Hz. PoE Version: RJ45 socket, takes power & data (90W)
Power Consumption	24VDC: 50W PoE: 90W (LED models)
Dimensions	Non-LED models: H 390mm W 211mm LED models: H 390mm W 315mm
Weight	8kg without lamps, 10kg with lamps
Operating Temperature	-40°C ~ +70°C (Light colours only, Black: 50°C)
Impact rating	Meets IK10 standards (w/ Polycarbonate)
Ingress protection	Meets IP67 standards
Vibration testing	TEN 50556:2011, clauses 6.3.2 & 11 (Table 3, Class AL2) EN 60068-2-64-2008 Test Fh
EMC	EN 55032:2015 EN55035:2017 Class A
Camera body	Marine finish as standard, Aluminium, die-cast alloy, with anodised, powder-coated finish
Colour	RAL 7035 Light-Grey or RAL 9005 Black. Custom RAL made to order.

Lighting & DORI	
Illumination Range	IR (850nm) to 500m White Light to 300m
DORI Category	**Distance covered**
Detection	IR Light: 500m White Light: 300m
Observation	IR Light: 275m White Light: 225m
Recognition	IR Light: 175m White Light: 175m
Identify	IR Light: 90m White Light: 90m



6.0 Warranty information

Redvision CCTV limited (Redvision) warrants the buyer that the product will, on the date of shipment, be free from defects in material & workmanship and will conform to Redvision's specifications, provided to the buyer. If any defect in material or workmanship appears in the product, Redvision will, at its discretion, either repair or replace the defective product without charge at Redvision's customer service centre or authorised repair facility or credit or refund the purchase price of the defective product, provided:

- The defect appears within **36** months from the date of purchase.
- Examination of the product confirms that the claimed defect actually exists.

Buyer shall follow Redvision's instructions regarding return of the defective product and no product will be accepted for repair, replacement, credit or refund without:

- Buyer or an authorised representative of the buyer first contacting Redvision Technical Support for assistance and actual confirmation of suspected defect or fault.
- Written authorisation of Redvision or in accordance with Redvision's written instructions, including an official **Return Merchandise Authorisation number (RMA)**, issued by Redvision CCTV Ltd.

In the case of any such return the buyer shall bear the risk of loss or damage and shall prepay all transportation charges to Redvision. The replaced product shall become Redvision's property. In no event shall Redvision be responsible for de-installation or reinstallation of the product or for the expenses thereof. If it is determined that returned product is not defective, the buyer shall pay Redvision all costs of handling, inspection, repairs and transportation at Redvision's then prevailing rates.

With respect to product not manufactured by Redvision, to the extent permitted, extends the warranties and affords the remedies to the buyer given to Redvision by its vendor of said products.

The foregoing warranties do not extend:

- to expendable items, including SD Cards and Hard Disks
- to experimental or development products
- to product which has been subjected to misuse, neglect, accident or abuse.
- to the unauthorised repair or alteration by anyone other than Redvision.
- to improper installation, storage or maintenance by anyone other than Redvision; to product used in material violation of Redvision's instruction or to product which has had its serial number or month and year of manufacture or shipment removed, defaced or altered or to software.

The term "**software**" means a set of logical instructions and table of information which guide the functioning of a processor. Such set may be contained in any medium whatsoever including, without limitation, hardware containing a pattern of bits representing such set, provided, however, the term "software" does not mean or include the medium.

Redvision shall charge for the repair of all product returned out of warranty. Call Redvision customer service +44 (0)1420 448 448 for an RMA number or visit www.redvisioncctv.com for more information.