Installation Manual

P500 (IRIS) Series ANPR/ALPR Camera

Title:	P500 Installation Manual
Revision:	1.5
Date:	January 2021

1. Contents

2. Change History

Date	Reason for Change	Revision No.
17th July 2018	First issue	1.0
6th Nov 2018	Update author and date, added Change History	1.1
6th Dec 2018	Updated cabling information, changes to Serial Comms and brackets	1.2
Dec 2019	Updated power rating, bracket information, ethernet pinout, tools and cross references	1.3
March 2020	Update to include information about Power over Ethernet (PoE) and Interface Adaptor Box (IAB)	1.4
21 January 2021	Add in FCC statement	1.5

3. Safety Information

Please read and follow all safety information contained in these instructions prior to the use of this camera system. Retain these instructions for future reference.

Explanation of Signal Word Consequences

⚠ **WARNING:** Indicates a hazardous situation which, if not avoided, could result in serious injury or death.

⚠ **CAUTION:** Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury and/or property damage.

NOTICE: Indicates a situation which, if not avoided, could result in property damage.

Explanation of Safety and Related Symbols

⚠ **Warning:** Hazardous Voltage

⚠ **Caution:** Lifting Hazard

⚠ WARNING

- **To reduce the risks associated with hazardous voltage, fire, and impact:**
  - Read entire installation guide prior to installation, maintenance and service.
  - Only qualified personnel should install, maintain, or service the system.
  - Installation and service activities must follow all local, regional, and national applicable building and electrical codes.
- **To reduce the risks associated with hazardous voltage and fire:**
  - Disconnect all AC power to the system when connecting or disconnecting components of the system.
  - Ensure that power cannot be restored inadvertently.

- If excavation is required, understand which local utilities are present prior to starting installation. Caution shall be taken when digging.

- **To reduce the risks associated with hazardous voltage:**
  - Use only with Neology-approved power supplies listed in manual.
  - System has not been evaluated for safe use with any power supply not specified by Neology.
  - Always disconnect power prior to installation, maintenance and service.
  - Ensure that the connection to the mains has no exposed connections.
  - Neology recommends that when the power supply unit is removed, a sealing cap be installed (not supplied).
  - In the event of rain, place a tarpaulin over the cabinet. Secure the tarpaulin around the base with elastic cords.
- **To reduce the risks associated with impact, sharps or fire:**
  - Contact manager if the site has been vandalized, there is immovable rubbish, an obstruction or for any unplanned traffic incident on site.
- **To reduce the risks associated with fire:**
  - Leave sufficient space around all electrical components for cooling.
  - Do not mount any electrical components directly above a heat source.
- **To reduce the risks associated with impact:**
  - Install using Neology supplied mounting brackets only.
  - Ensure that all hardware is firmly tightened before loading.
  - Installation and service activities must be in compliance with all applicable building and electrical codes.
  - Any mounting surface must be able to support a minimum static load of equal to the maximum weight of the fixed camera system plus any additional live load due to environmental conditions.
  - Always pay attention to the road.
  - When required work in a team of two or more and ensure line of sight or contact over walkie-talkies (radio) at all times.
  - Always appropriately secure the ladder to the pole.
  - When appropriate use suitable safety harness and lanyard for securing installer to pole.
  - For United Kingdom installations, ensure Approval In Principle (AIP) is signed off by designer and Highway Agency to ensure design meets current standards.
  - Appropriate sign off and approvals shall be obtained prior to installation, maintenance and service.
  - Use only lanyards that are properly installed and inspected to hold tools.
  - Ensure length of lanyard prevents tools from contact with pedestrians or vehicles.
  - Always deploy traffic management in accordance with applicable local and government regulations. - Do not perform work if installer considers conditions unsafe.
  - Wear appropriate PPE on site at all times.

⚠ CAUTION

- **To reduce the risks associated with impact, muscle strain:**
  - Use appropriate PPE and follow safe workplace practices during installation.

- **To reduce the risks associated with muscle strain:**
  - Use appropriate mechanical or human assistance when lifting system components.
- **To reduce the risks associated with environmental contamination:**
  - Dispose of all system components in accordance with applicable local and government regulations.

NOTICE

- **To reduce the risks of property damage:**

  - Do not modify or attempt to service the camera. Return to Neology authorized service centres for repair or service.
    There are no user serviceable parts.
  - Do not use solvents or harsh cleaners on camera.
  - Do not use abrasive materials on camera window.

4. Federal Communications Commission (FCC) statement

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. 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 can radiate 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 own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Neology is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that might cause undesired operation.

5. Introduction

5.1 Document Overview

This document will describe and illustrate an installation procedure for a P500 (P520 & P525) series ANPR/ALPR camera. It assumes that all cabling and mounting apparatus such as poles or gantries are already installed. It will cover:

- Safety information
- P500 Overview
- Parts lists
- Installation tooling
- Camera mounting and alignment
- Electrical connectivity
- Final commissioning
- Warranty
- Approvals, Specifications and Regulatory Information

Please see the "P500 User Manual" for information on configuring the camera software, security and information for software developers.

⚠ **WARNING:** The installer retains responsibility for ensuring that all relevant procedures, processes and working practices are followed.

Neology recommends that a risk assessment is carried out prior to installation.

If in doubt, ask Neology for technical support.

Support Request:	**Tel: +44 (0) 1256 581135** **support@pipstechnology.co.uk**
Support Request: (USA)	**833-PIPS-LPR (833-747-7577) (0ption2)** **support@pipstechnology.com**
Service Centre:	**Tel: +44 (0) 1513 554313** **service@pipstechnology.co.uk**

5.2 Intended use

This camera system is designed to provide monitoring and identification of vehicles in an outdoor environment. This camera system is used for industrial monitoring such as law enforcement, campus/site security, car parking and tolling applications. It is expected that all users be fully trained in the safe operation and installation of this camera system.

5.3 Camera Overview

The P500 series camera system is a fully integrated ANPR/ALPR solution designed to capture multiple vehicle licence plates within the cameras field of view.

Features:

- Fully Integrated processor running Linux OS.
- Dual Image Sensors
- Integrated IR LED illumination
- Wired Gigabit Ethernet
- Optional WiFi
- Optional 4G Wireless modem
- Optional GPS
- 2 RS232 Serial Ports (one dedicated to the console).
- 2 Opto-isolated digital Inputs
- 2 Opto-isolated digital Outputs
- Relay Output

5.4 General Site Requirements

The P500 is designed to be pole, gantry or wall mounted and should be installed above traffic lanes to give a clear view of front or rear vehicle licence plates. Power and communications will need to be provisioned prior to the installation. If possible, the P500 and associated cabling should be positioned to avoid any tampering, theft or vandalism. If wired Ethernet is to be used for communications then a maximum cable run of 100 meters to any router, switch or hub should be maintained. If wireless communications are used, then an assessment of signal strength to any Wireless Access Point or Mobile Network should be made.

5.5 Camera Lens Options

The camera is available with dual motorised zoom lenses. The motorised zoom lens provides flexibility in terms of mounting/alignment and allows the camera to be easily redeployed.

6. Camera Specifications

Dimensions (L x W x H)	
Camera	35.3 x 27.2 x 17.8 cm (13.9 x 10.7 x 7.0 inches) *Including hood, excluding optional antennas*
Weight	
Camera	6.4kg (14.1lb) including hood, excluding brackets
Power	
Input Voltage	36 to 55 VDC (48 VDC Nominal)
Power rating	40W typical @ 20degC
Power over Ethernet	IEEE802.3bt Type 3 (60W)
Operating temperature	
Normal operating condition	-40° to 140 °F / -40° to 60° C

7. Parts lists and tables

7.1 Camera Assembly

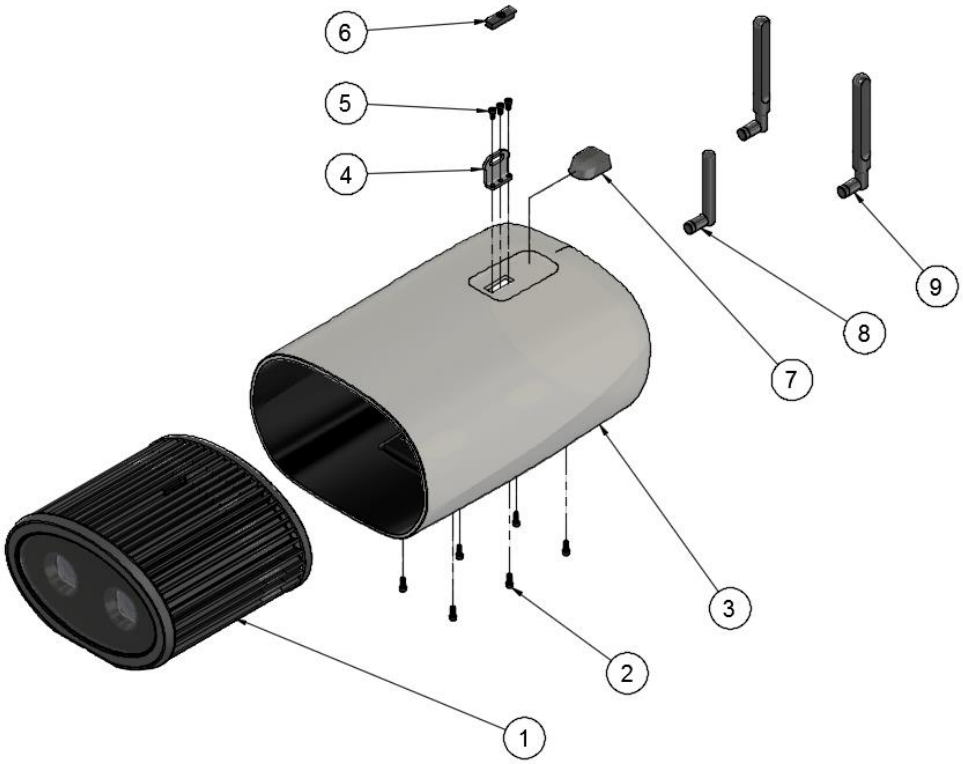


Figure 1 Camera Assy

Item	Qty	Description
1	1	Camera Assembly
2	6	M4x12 Cap Head Screw
3	1	Hood
4	1	Carabiner Loop
5	3	M4x8 Cap Head Screw
6	1	Carabiner Loop Plug
7	1	GPS Antenna
8	1	WiFi Antenna
9	2	Modem Antenna

Table 1

7.2 Rear Panel Connectors

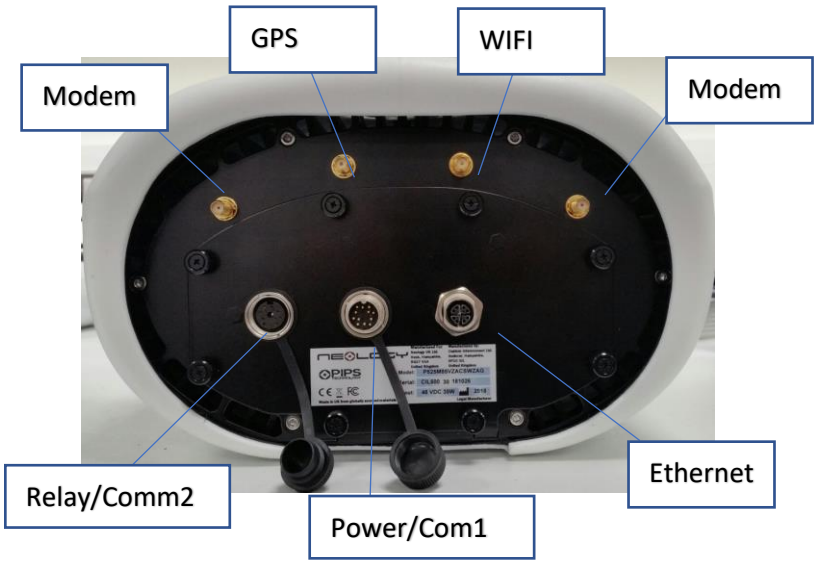
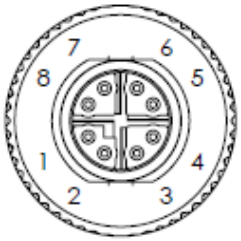


Figure 2 Camera Rear Panel

7.3 Ethernet Cable

Figure 3 Ethernet Cable

Part Number: HC350242LXXX

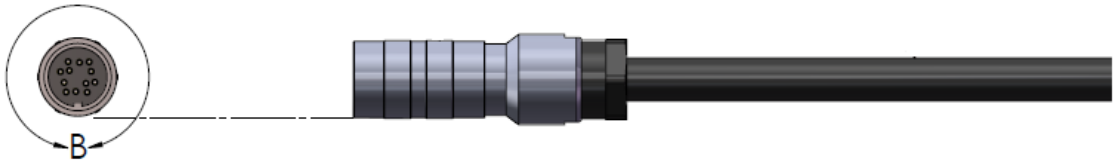


DETAIL A
SCALE 4 : 1

ETHERNET CABLE CONNECTION TABLE			
COLOR	99-3787-810-08	FUNCTION	NOTES
ORANGE/WHT	1	ETH-TX-D1(+)	TWISTED PAIR
ORANGE	2	ETH-TX-D1(-)	
GREEN/WHT	3	ETH-RX-D2(+)	TWISTED PAIR
GREEN	4	ETH-RX-D2(-)	
BROWN/WHT	5	ETH-BI-D4(+)	TWISTED PAIR
BROWN	6	ETH-BI-D4(-)	
BLUE/WHT	7	ETH-BI-D3(-)	TWISTED PAIR
BLUE	8	ETH-BI-D3(+)	

Figure 4 Connector Detail

7.4 Power, Com1 and Trigger1 Cable



Part Number: HC350241LXXX

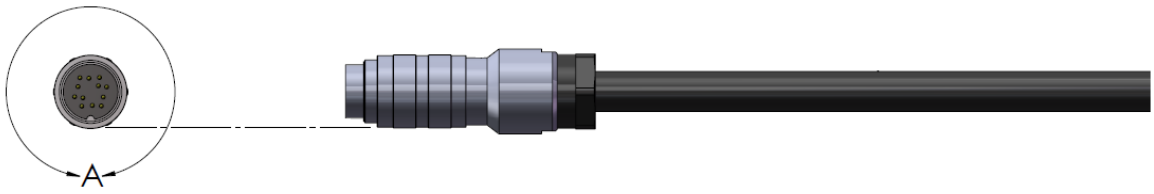
Figure 5 PWR/COM/TRIG1

DETAIL B
SCALE 4 : 1

PWR-COM1-TRIG1 CABLE CONNECTION TABLE			
COLOR	99-5630-15-12	FUNCTION	NOTES
BLACK	A	PWR(+)	TWISTED PAIR
WHITE	L	PWR(-)	
RED	B	PWR(+)	TWISTED PAIR
WHITE	C	PWR(-)	
BROWN	M	TRIG1-IN(+)	TWISTED PAIR
WHITE	D	TRIG1-IN(-)	
ORANGE	E	RS232-RX	TWISTED PAIR
WHITE	F	RS232-RXCOM	
YELLOW	H	RS232-TX	TWISTED PAIR
WHITE	G	RS232-TXCOM	
GREEN	K	TRIG1-OUT(+)	TWISTED PAIR
WHITE	J	TRIG1-OUT(-)	

Figure 6 Connector Detail

7.5 Relay, Com2 and Trigger2 Cable



Part Number: HC350243LXXX

Figure 7 Relay/COM2/TRIG2

DETAIL A
SCALE 4 : 1

CONNECTION TABLE			
COLOR	99-5629-00-12	FUNCTION	NOTES
BLACK	A	RELAY-NO	TWISTED PAIR
WHITE	L	UNDEFINED	
RED	B	TRIG2-OUT(+)	TWISTED PAIR
WHITE	C	TRIG2-OUT(-)	
BROWN	D	TRIG2-IN(+)	TWISTED PAIR
WHITE	H	TRIG1-IN(-)	
ORANGE	E	RS232(2)-RX	TWISTED PAIR
WHITE	F	RS232(2)-RXCOM	
YELLOW	M	RS232(2)-TX	TWISTED PAIR
WHITE	G	RS232(2)-TXCOM	
GREEN	J	RELAY-NC	TWISTED PAIR
WHITE	K	RELAY-COM	

Figure 8 Connector Detail

8. Initial Camera Configuration

8.1 SIM and SD Card Installation

The P500 is a hermetically sealed system and has no user serviceable parts in the main camera body. To facilitate the use of SIM or SD cards, the P500 has been designed with an easy access rear panel. It is recommended to insert SIM and SD cards prior to camera mounting although it is possible to install these whilst the camera is mounted. Figure 9 shows the open rear panel.

Note: It is recommended that the camera is disconnected from the power supply before opening the rear panel.

To open the rear panel, unscrew the eight captive screws anticlockwise (Figure 9 – part a). Do not try to remove the screws completely. They will pop out under spring pressure once the threads have disengaged. The rear panel is hinged at the base. Pull the rear panel down until the SIM and SD card slots are accessible. Insert SIM and SD cards as appropriate.

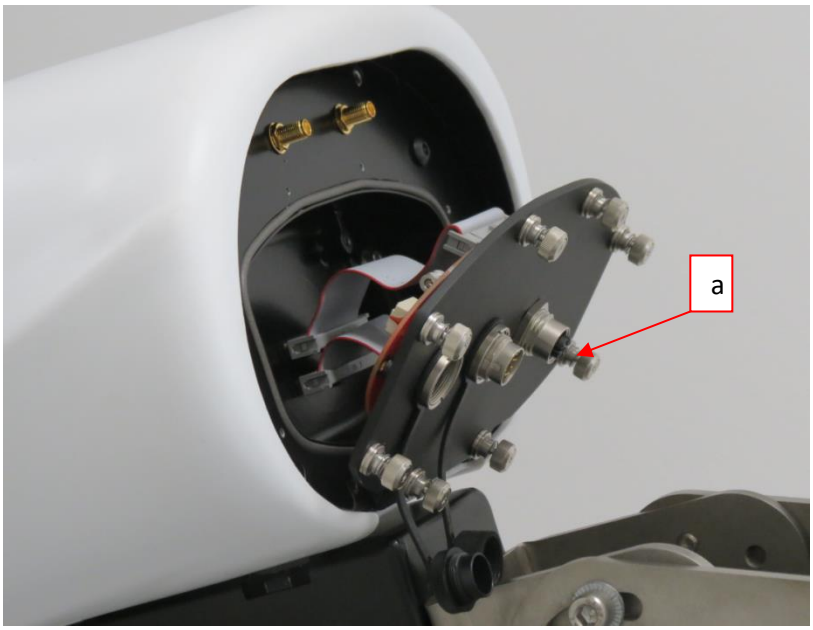
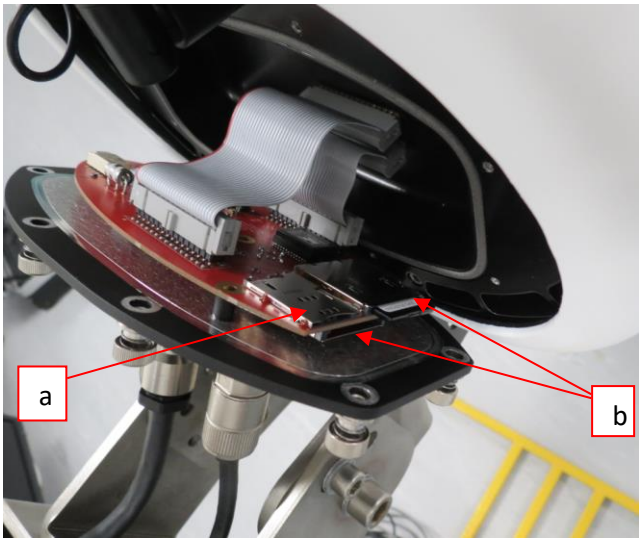


Figure 9 Rear Panel



(a) indicates SIM card slot
(b) indicates SD card slots

Figure 10 SIM and SD card installation

When closing the rear panel, ensure the ribbon cables are in position and carefully close the panel. Tighten the eight captive screws by hand. Once the screws have been initially tightened, they must be fully tightened with a No. 2 Phillips headed screwdriver. Failure to fully tighten the screws may allow water ingress.

Note: Ensure the rear panel seal (Figure 11 -part a) is fully seated in its recess. The seal may become detached from the main camera body when removing the rear panel.

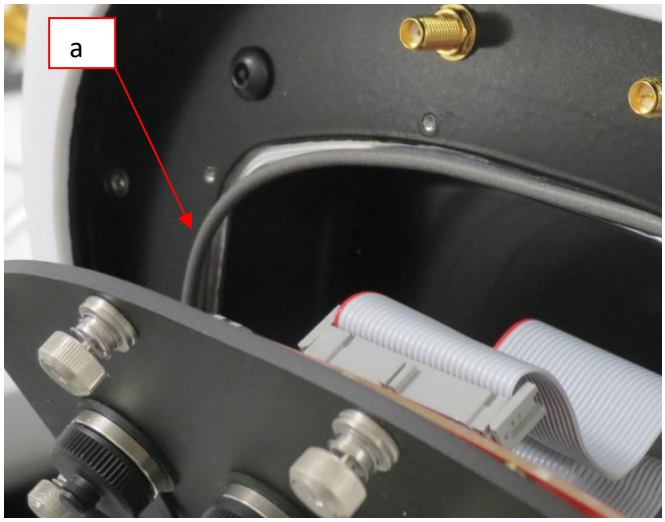


Figure 11 Rear panel seal

8.2 Camera IP address

It is recommended to configure camera IP address, Subnet Mask and Gateway address prior to camera mounting. Refer to “P500 User Manual” for further details and use of “Toolkit Software”.

9. Installation Tooling

	Tool	Description/Use
1	Tin Snips	Sizing straps for pole Mtg. bracket
2	8mm socket	Clamping strap fixings, pole Mtg. bracket
3	9/16” long series Socket	Camera mounting, Track Stud nuts, 3/8”nut
4	10mm Hex key or socket	Pole Mtg. bracket
5	6mm Hex key or socket	Pole Mtg. bracket
6	Wire cutters and strippers	Stripping and preparing cable
7	RJ45 crimper	Ethernet cable termination
8	Ring Crimp tool	Cable drain termination
9	Heat gun	Heat shrink sleeving
10	Soldering Iron & Solder	Cable termination
11	Selection of Screwdrivers	General Use

Table 2

10. Camera Brackets and Mounting

10.1 Bracket description

The P500 camera can be used with a selection of brackets, depending on the mounting arrangement required. The camera is also fitted with a two-point mounting system that helps ensure the camera alignment is maintained in the event of removal and refit from the bracket

The bracket options available are:

- Camera adapter bracket
- Pole Mount Bracket
- Pelco Style Pole Mount
- 3-Axis bracket

⚠ **WARNING: As Neology cannot be aware of the specific details of every installation, the installer retains full responsibility for ensuring the camera is installed in a safe, secure and appropriate manner.**

The installer is responsible for ensuring the installation complies with all relevant local regulations and conditions.

Camera adapter bracket A black powder coated steel adapter, that converts the dual point track stud fixings on the P500 to a standard metric fixing. This is subsequently used to connect to additional mounting hardware.

Pole Mount Bracket Designed to provide a three axis adjustment for when the P500 is mounted to a near vertical pole or wall. The bracket is secured to a pole by means of two adjustable clamping straps, or can be secured to a wall via 4-off fixing points. The bracket is constructed of stainless steel, and has a natural colour finish. This bracket attaches to the camera via the standard ‘camera adapter bracket’.

Pelco Style Pole mount bracket. An alternative method for pole mounting the P500, this bracket utilises an adapter piece to attach the camera to an industry standard ‘Pelco style’ bracket. This bracket utilises a cast aluminium main body, with a stainless steel adapter. This bracket attaches to the camera via the standard ‘camera adapter bracket’.

3-Axis Bracket. This bracket provides a 3 axis adjustable mounting for use on horizontal surfaces such pedestals or shelves. The bracket is made of stainless steel, and is black powder coated. This bracket connects directly to the underside of the camera, and so does not require the ‘camera adapter bracket’.

10.2 Camera Adapter Bracket

The P500 camera bracket comes with the P500 camera and is used with both the pole mount bracket options. It can also be used to convert the camera fixings to a metric mount for use with the additional brackets

Figure 12 P500 Camera Bracket shows the bracket together with its track studs attached.

Figure 12 P500 Camera Bracket and assembly

The P500 camera bracket is attached to additional mounting hardware with socket head cap screws and washers. There is both a 12mm main fixing, and an additional 8mm friction lock fixing for the rotation adjustment.

Physical Characteristics

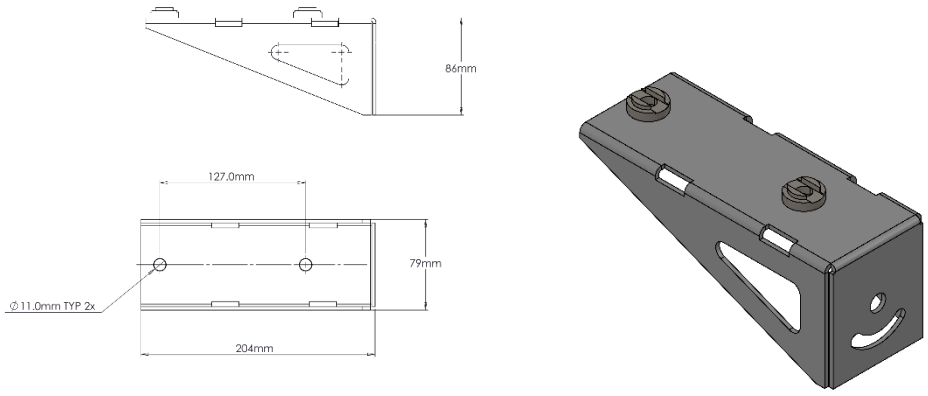


Figure 13 Camera Bracket physical characteristics

The weight of the bracket is approximately 0.95kg

The bracket is made of steel, and is black powder coated.

Installation

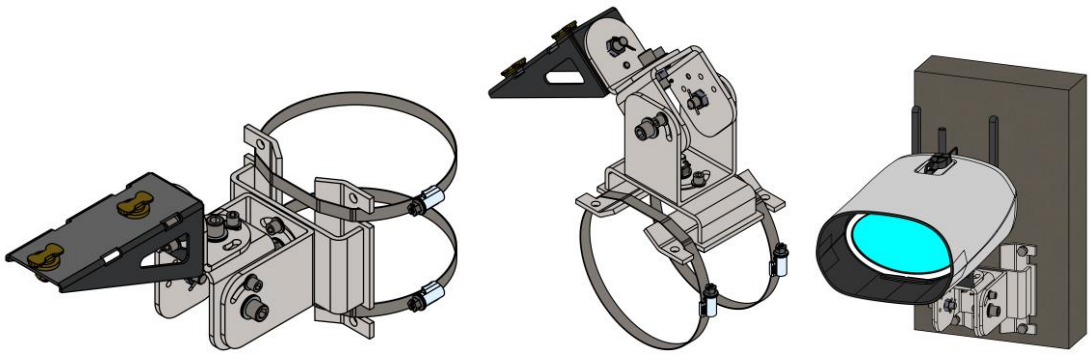
Adjust all brackets to an approximate live camera field of view and lock into position. Ensure there is about 15mm of vertical movement on each of the track studs. Place the P500 on top of the P500 camera bracket, locating the track stud recesses on to the track studs. Once in position and while holding the P500 securely, push the track studs further into the track stud recesses.

Slide the P500 forward and allow the track studs to drop into a locking position. Although loose the P500 should not move laterally.

Tighten the track stud Nylock nuts and ensure the P500 remains parallel to the P500 camera bracket. Insert split pins and ensure all fixing are secure.

10.3 Pole Mount Bracket

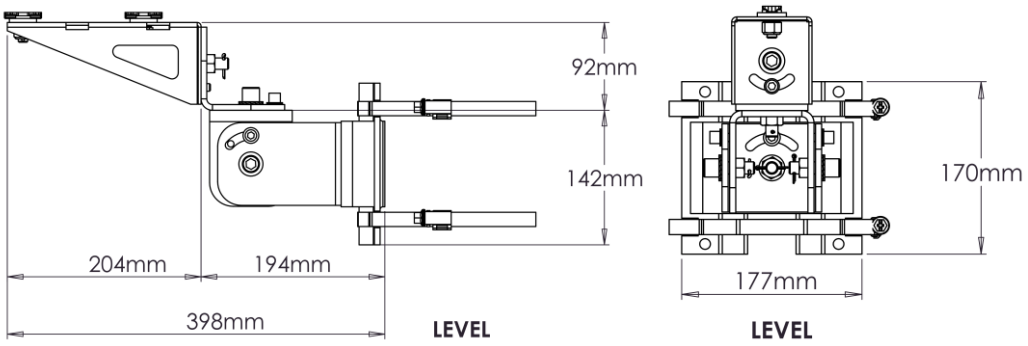
The pole mount bracket option allows for a five axis adjustment of the camera when attached to vertical poles, horizontal beams or a suitable wall.



Note: Images shown with ‘camera interface adapter’ fitted

The bracket includes 90deg offset anchor points in each axis. This enables the bracket to be fitted to both a horizontal or vertical beam/pole, with fine adjustment in each position.

Physical Characteristics



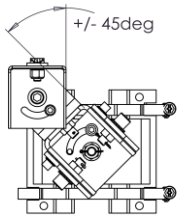
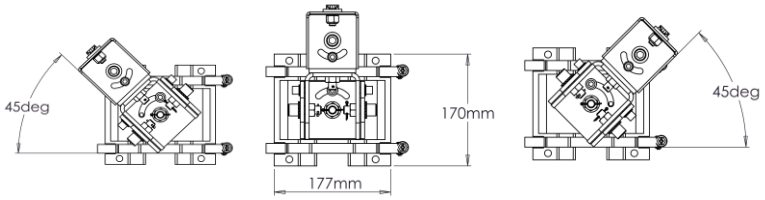
**Bracket shown with the camera interface adapter for reference*

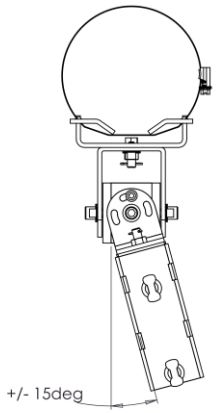
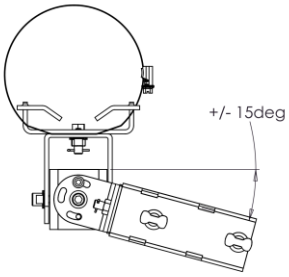
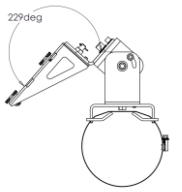
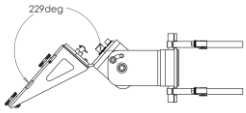
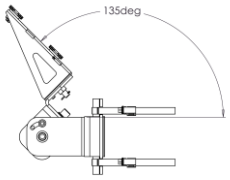
Figure 14 Pole Mount Bracket physical characteristics

The weight of the bracket is approximately 7kg

The bracket is made of stainless steel, and has a natural colour finish (i.e. not painted)

Range of adjustment.

Roll *+/- 45deg* *Relative to tilt axis*	 ROLLED LEFT 45°
Tilt *+/- 45deg* *About 4 separate 90deg origin points* *(shown about zero position only for clarity)*	 TILT LEFT 45° LEVEL TILT RIGHT 45°

Pan *+/- 15Deg, about three separate 90deg origin points*	 PAN +/- 15°  ROTATED 90° PAN +/- 15°
Rotation	360deg around pole by adjustment of band straps
Look down *+45/-49deg from horizontal*	 ROTATED & ANGLED DOWNWARD 229°  ANGLED DOWNWARD 229°  ANGLED UPWARD 135°

Note: *diagrams show the extent of bracket movement, but some movement may be limited by interference between camera and pole in some installations i.e. upward look and 90deg pan adjustments*

Installation

The bracket is designed to fit a minimum pole diameter of 114mm or 4.5 inches. The complete bracket weighs approximately 7kg so it is advisable to detach the pole mount(a) from the “U” bracket assembly to aid installation by removing the split pin, 12mm nut/washer and 8mm locking bolt/washer(b).

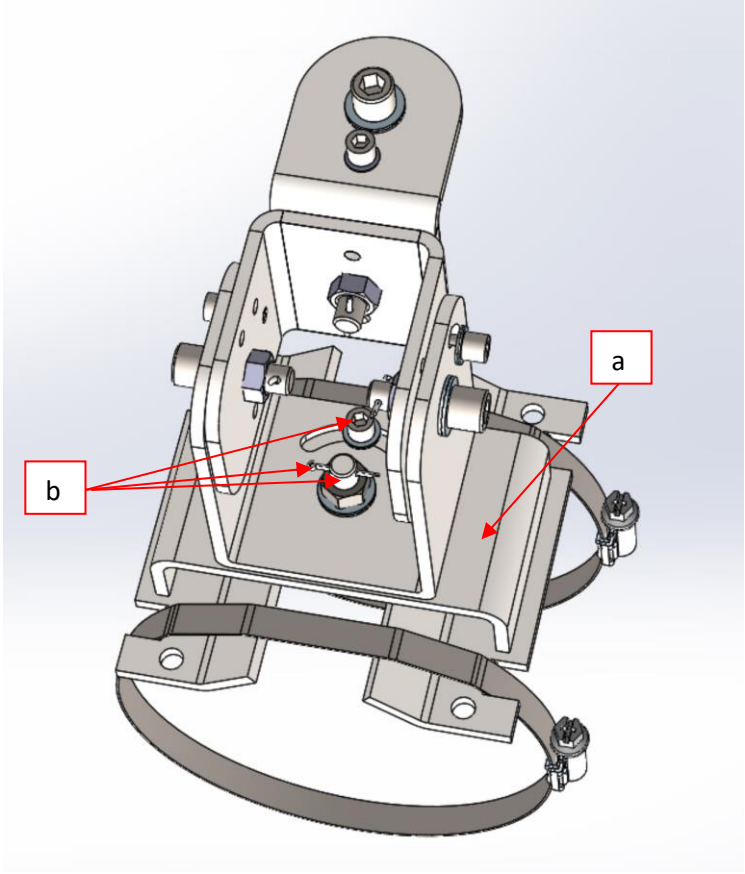


Figure 15 Pole Mount Bracket Assembly

.

Measure and cut two clamping straps to an appropriate length. Assemble the straps (Figure 16 Pole Mount Bracket Mounting – strap detail) but leave one end at its maximum adjustment with the other end open. With the camera field of view in mind, place the pole mount (a) in position and attach and tighten the top strap. Attach and tighten the lower strap and reassemble the parts removed previously (Figure 15). **Note**: if any split pins are damaged, replace them.

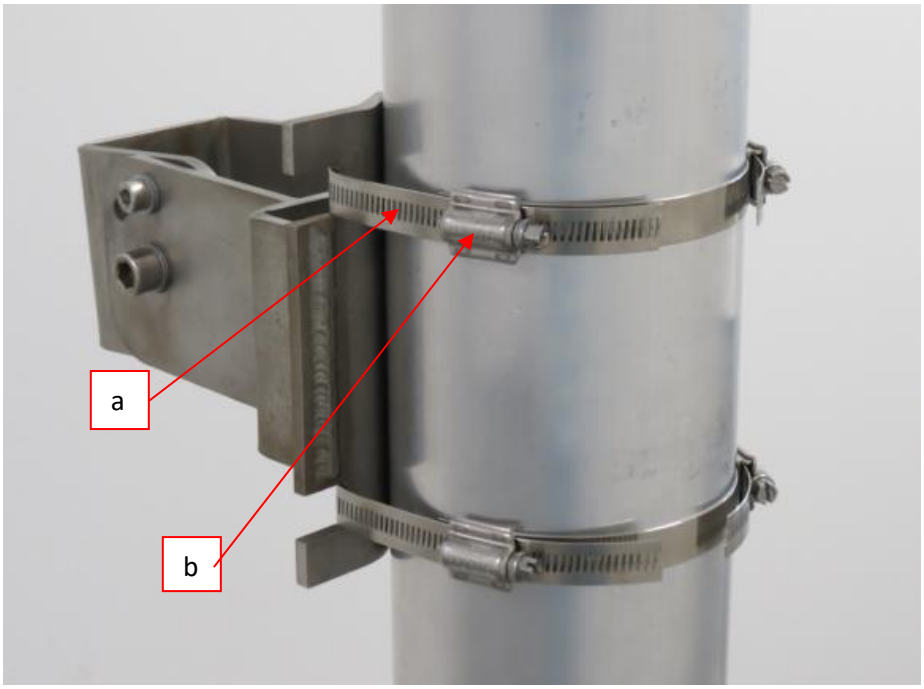


Figure 16 Pole Mount Bracket Mounting – strap detail

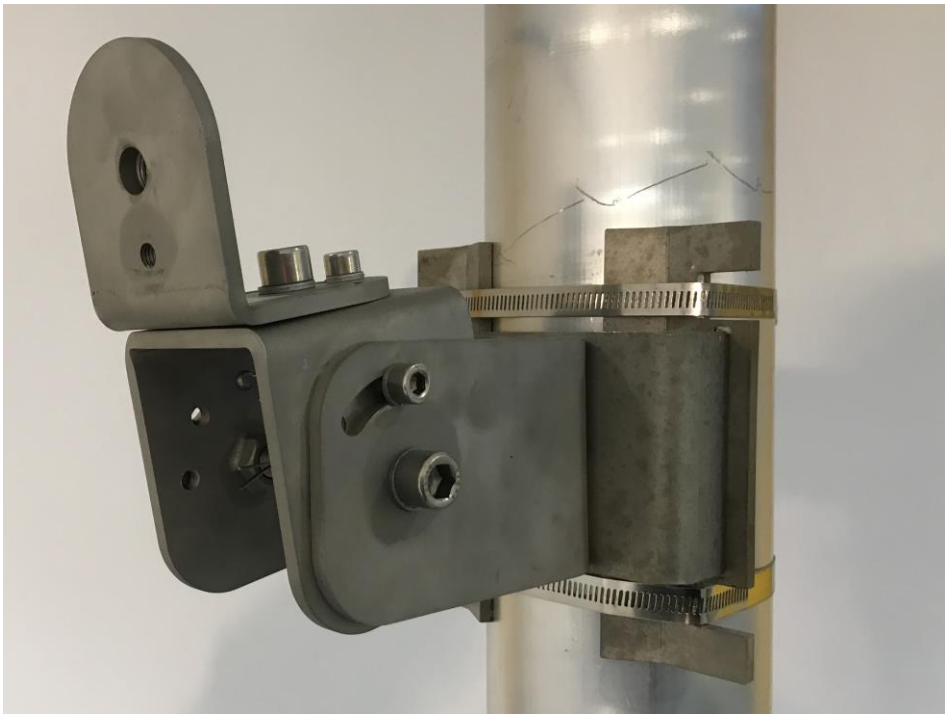
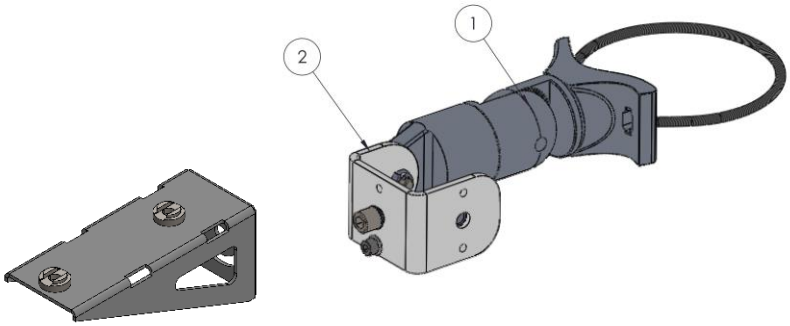


Figure 17 Pole Mount Bracket Detail

10.4 Pelco Pole mount bracket

This bracket utilises a widely used bracket manufactured by Pelco, and attaches the camera via a small adapter and the camera bracket.



**note, item 1 denotes the Pelco Bracket, and item 2 is the Neology adapter, and the camera bracket is shown for reference*

Figure 18 Pelco Bracket, general usage

Physical Characteristics

For details on the pelco bracket, please refer to the original manufacturer's documentation for "Pelco Astro Mini-Brac part # SP-5533"

The additional adapter is stainless steel with a natural colour finish.

Range of adjustment

The Pelco bracket provides an adjustable wire rope anchor, and the mounting orientation for the camera can be rotated in 3 axes giving a high degree of flexibility.

For full details on the capabilities of this bracket, please refer to the original manufacturer's documentation for "Pelco Astro Mini-Brac part # SP-5533"

Installation

Carry out a trial fitment of the pole mount bracket onto the pole, this is best carried out from ground level initially (assuming the pole is not tapered). Fit the pole mount bracket to the pole by wrapping the stainless cable around the pole. This can be done by loosening the 2 off ½ inch bolts (see Figure 19), pulling the cable through until there is just enough slack to enable you to fit the clamp screw complete with crescent shaped bearing washer into the retaining saddle (see Figure 19), it is important that there is enough thread available to allow the clamp bolt to be tightened sufficiently.

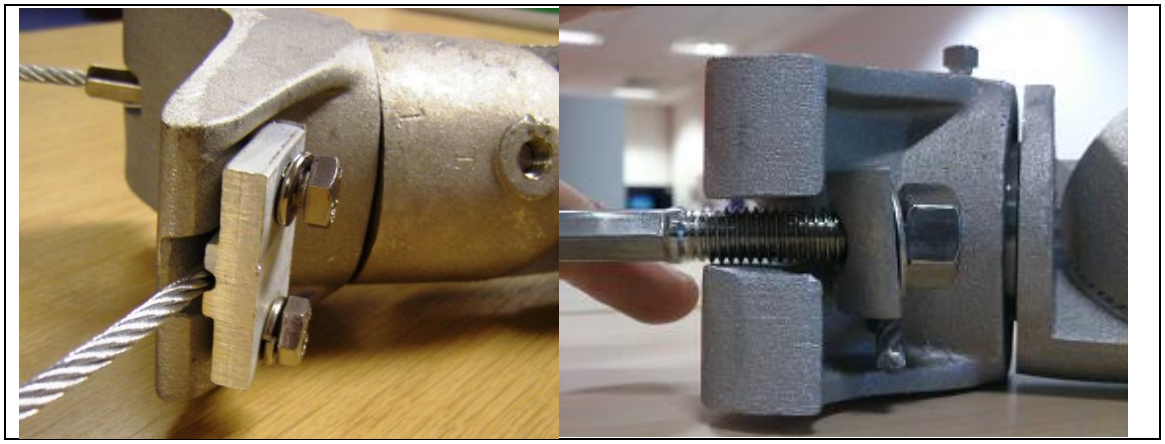


Figure 19 Pelco Bracket, cable

Once the cable length is set the 2 off ½ inch clamp bolts can be tightened, ensure that both ½ inch bolts are equally tightened.

Should the weather conditions allow, ascend to the working height using the appropriate equipment, and fit the pole mount bracket onto the pole and loosely tighten the clamp screw. Now the camera can be passed to the fitter working, it may be appropriate to use a rope to raise the camera. Ensuring the camera is tied off when working at height.

Attach the camera securely to the pole mounting bracket by using camera mounting bracket, in line with instructions in Section 10.2 Camera Adapter Bracket.

Undo the camera connector blanking plugs/ plugs and then connect the camera cable/ cables to the camera. Ensure connections to the camera are tight.

Align the camera appropriately and once the camera is aligned, ensure all the fittings on mounting brackets are tight and that split pins and lock nuts are fitted where required. Once all fixings are tightened re-check the camera alignment.

10.5 Three Axis Bracket

This bracket provides a method for mounting the P500 to a horizontally orientated fixing point, such as a suitable horizontal strut, bar or general CCTV mounting. This bracket does not require the camera mount bracket, as it connects directly to the track stud fixings.

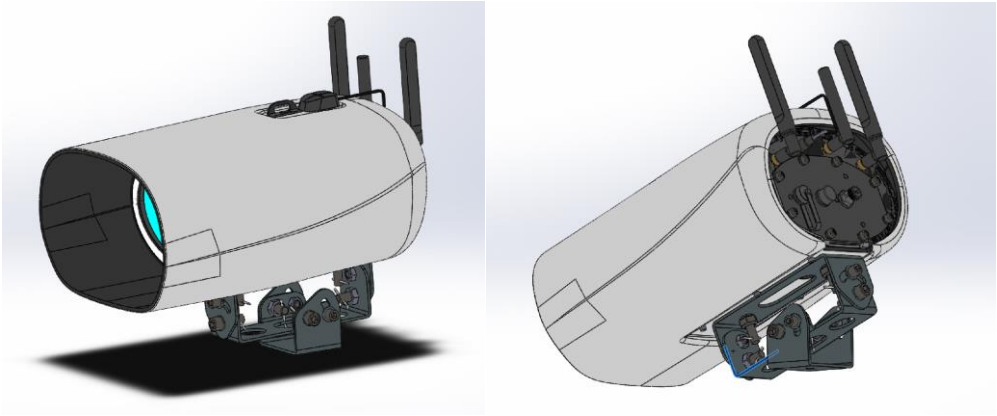


Figure 20 Three Axis Bracket, general arrangement

Physical Characteristics

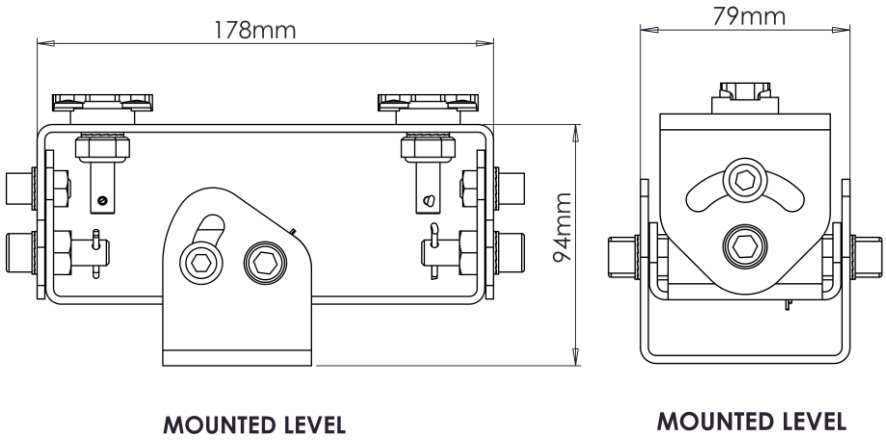
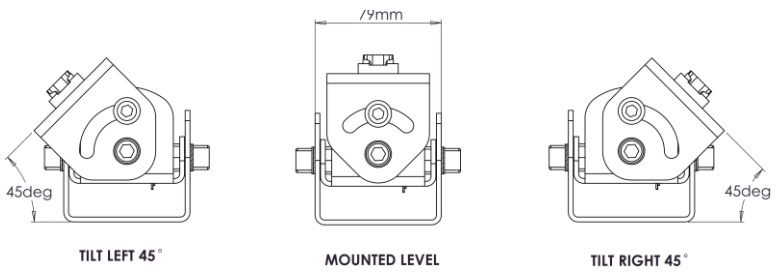
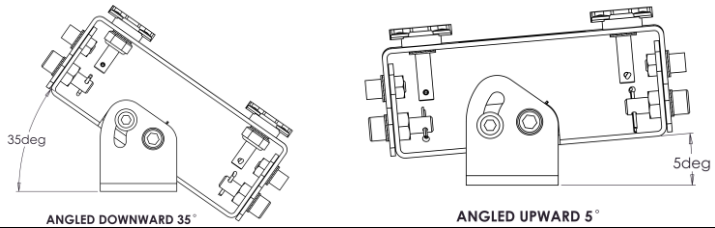
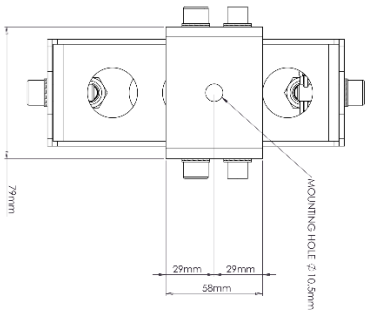


Figure 21 Three Axis Bracket; Physical characteristics

The weight of the bracket is approximately 1.5kg

The bracket is made of stainless steel and is black powder coated

Range of adjustment.

Tilt +/- 45deg	
Down look +5/-35deg from horizontal	
Pan 360deg around single mount point (bottom view)	

(note: diagrams show extent of bracket movement, but some movement may be limited by interference between camera/bracket and mounting surface. i.e. downward look angle require mounting near edge of surface)

Figure 22 Three Axis Bracket; Range of adjustment

Installation

Adjust all brackets to an approximate live camera field of view and lock into position. Ensure there is about 15mm of vertical movement on each of the track studs. Place the P500 on top of the bracket, locating the track stud recesses on to the track studs. Once in position and while holding the P500 securely, push the track studs further into the track stud recesses.

Slide the P500 forward and allow the track studs to drop into a locking position. Although loose the P500 should not move laterally.

Tighten the track stud Nylock nuts and ensure the P500 remains parallel to the P500 camera bracket. Insert split pins and ensure all fixing are secure.

11. Electrical Connection

11.1 Cable Connections

The P500 has three cable connections and any combination of these may be installed depending on the camera configuration.

Cable 1 – Ethernet

This cable is required when Ethernet communication is needed, or if Power over Ethernet (PoE) is used. If wireless communication (Wi-Fi or 4G) is used, then this cable does not need to be fitted but can still be fitted to aid with commissioning.

Cable 2 – Power, Com1 & Trigger1

This cable is required for providing power when PoE is not used. This cable is also required if access to the Com1 console serial port or trigger1 signals are needed. If PoE is used then this cable is not required.

Cable 3 – Relay, Com2 & Trigger2

This cable is only required if access to the relay output, Com2 serial port or trigger2 signals are needed.

Figure 23 Power/Serial Comms/Trig1 and Ethernet cables

Ensure cable connectors are clean and free from any debris before insertion. Each connector is polarised and will only fit one socket on the rear panel. Figure 23 shows two cables fitted with the dust cap fitted to the third connector.

Note: ensure the dust caps are fitted to any unused connector to prevent water ingress. GPS and Wi-Fi network antennas are also shown. The GPS antenna has a double-sided adhesive pad which attaches to the P500 hood as shown.

11.2 Power over Ethernet

Initial builds of the P500 did not support Power over Ethernet (PoE), to determine if the camera supports PoE please check the camera label. If the label lists 802.3bt as an input supply then PoE is supported, if not then unfortunately PoE is not supported on that camera.

The P500 camera can be powered using PoE, to do so a suitable PoE power source is required. The PoE power source must be capable of supplying at least 60W and be IEEE802.3bt compliant.

Installation of the PoE power source equipment should follow the manufacturers instructions and conform to local wiring regulations.

If using PoE, the standard DC power supply does not need to be connected, although can still be connected to provide a redundant power source.

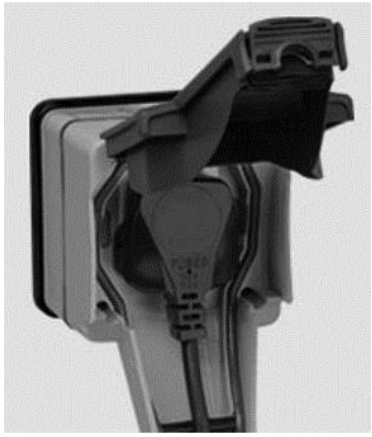
If power is provided via PoE and the standard DC supply, then the standard DC supply will be the one that is used. If the DC supply fails, then there will be a small power outage to the camera before the PoE takes over so the camera will reboot. When the DC supply returns, the camera will switch back to it with no power outage.

11.3 Camera Power Supply

The P500 camera system is powered by a 48VDC PSU normally supplied with the camera. This requires a 240/110VAC mains input. The power supply can be mounted in a roadside cabinet or enclosure or within the camera mounting pole.

⚠**Warning**: Hazardous Voltage

Connection of utility mains to a 240/110VAC to 48VDC power supply should conform to local wiring regulations and colour coding as well as connector and power supply manufacturer's instructions. Mains AC connection to the power supply mains terminal can be in the form of a Plug and Socket or Grounded Terminal Block or an In-line Connector or combination. Figure 24 shows a UK 13amp sealed Plug & socket and a grounded terminal block.



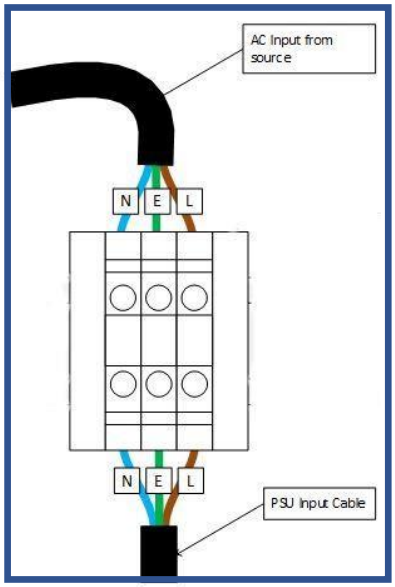


Figure 24 UK 13 Amp Plug & Socket and Earthed Terminal Block

Figure 25 shows an IP68 In-Line connector with fused circuit breaker (cut-out) inside the camera mounting pole.

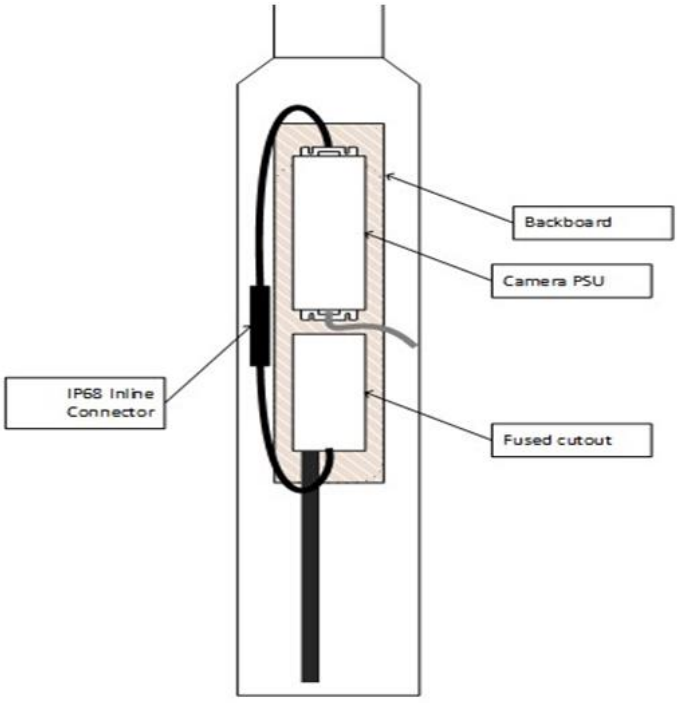


Figure 25 Mounting Pole Power Supply

IP68 Inline connector.

To change the camera PSU in case of failure with ease and safety. An Inline IP68 Detachable connector can be used.

Figure 26 Inline Mains Connector

Here is an example of a connector that can be used for this purpose:

3 Pole Female, Male Cable Mount Mains Inline Connector, Cable Diameter 5 → 9mm Rated At 16A,250 V ac/dc RS Stock No. 478-7543 Brand Elkay Electrical

11.4 Ethernet Communication Connections

The Ethernet cable core is terminated with a standard RJ45 plug. Refer Figure 4 in Section 7.3 Ethernet Cable for wiring information and wire colour codes. **Note**: keep twisted pairs as close to plug as possible.

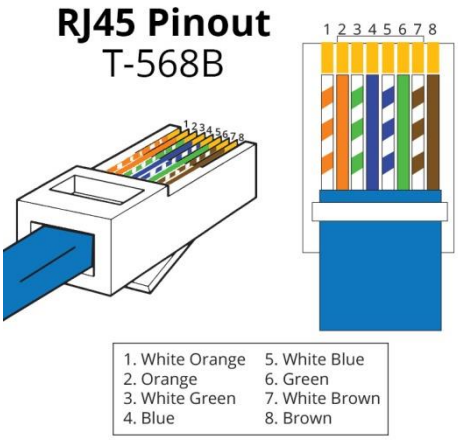


Figure 27 RJ45 Pinout

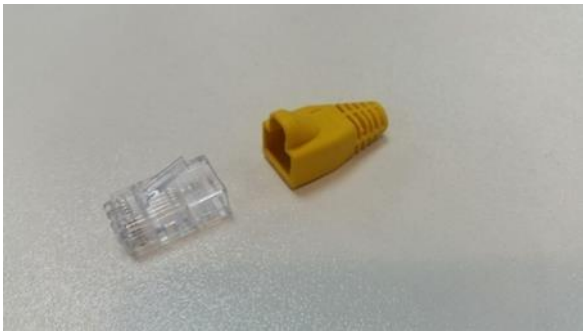


Figure 28 RJ45 Plug and Boot

11.5 Serial Communications

Use Case 1 Power over Ethernet

If the camera is using PoE, the Power and serial cable does not need to be connected, so there is no need for terminating the serial communication lines.

Use Case 2 Wired but not Used

The RS-232 interface on Com1 is used primarily for initial configuration, programming and diagnostics. If no diagnostics are required and the RS-232 interface is not to be used, the RX **MUST** be connected to signal GND (0V) to prevent noise on the communication lines.

Note: Failure to terminate the communication lines may prevent the camera from powering up successfully.

Use Case 3 Wired and Used

If diagnostics are required or the serial port is used for some other purpose, Com1 can be terminated with a DB9 connector as shown in Figure 29 below. When not in use, the P500 Serial Terminator (Figure 32) **MUST** be connected to the DB9 to prevent electrical noise or interference on the serial RX line.

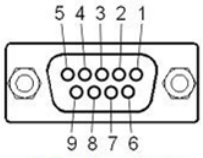
Note: If the terminator is not installed, the camera may not power successfully.

Note: Only RX, TX and GND pin are connected.

Note: Both RX & TX wire pairs have common grounds which should be connected to GND pin 5.

RS232 Connections

RS232 DB9 Pin	Function	Wire Colour
2	TXD	Yellow
3	RXD	Orange
5	GND	White (Yellow)
5	GND	White (Orange)



Female DB-9

Figure 29 RS-232 Connector Pinout and Connections

The D-type connectors can be of the solder bucket type or field-installable screw terminal type. Some examples are shown below.

Figure 30 Field-installable 9-way D-Sub

Figure 31 Solder bucket D-Sub

Note: Terminator is only required when DB9 connector is present, otherwise RX can be connected to signal GND (0V)

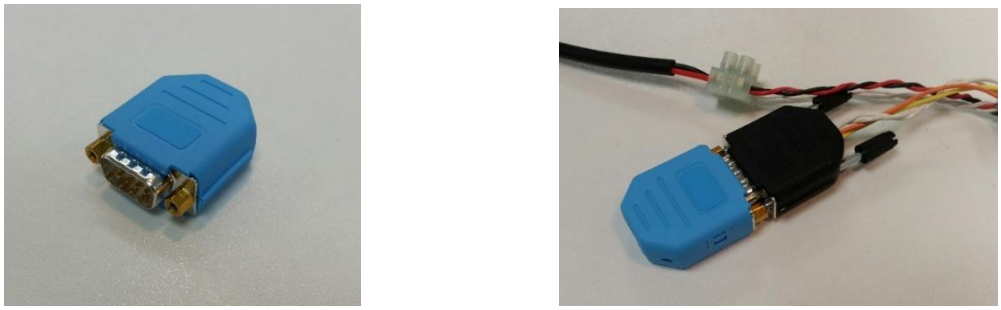


Figure 32 P500 Serial Terminator

11.6 Terminating Connections in a Mounting Pole

The recommended method for terminating camera cable connections inside a mounting pole is to use an IP67 junction box as shown below.

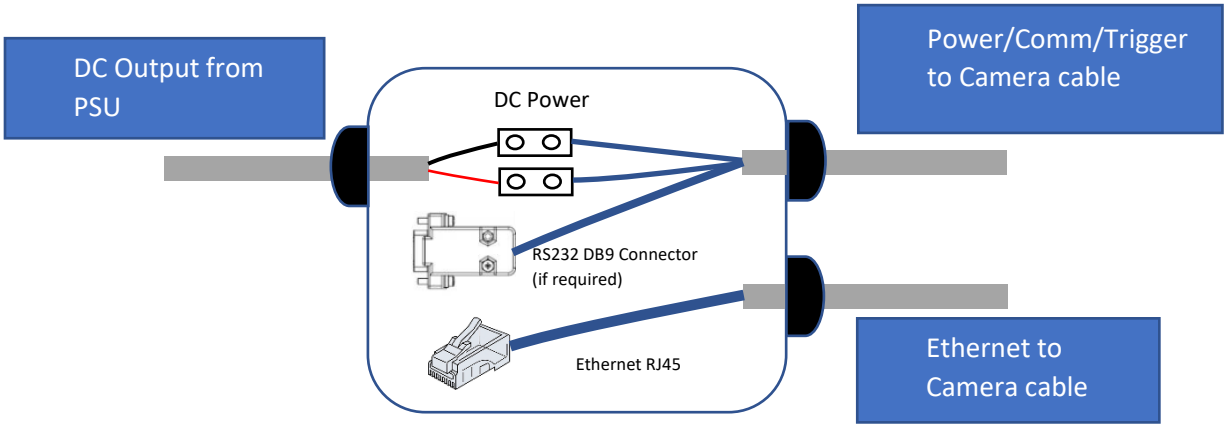


Figure 33 IP67 rated Junction Box

Refer to Section 7 for cable wire colour codes and descriptions.

Trim the drain wire and attach the crimp ring terminal. **Note**: leave enough drain wire length to attach the crimp ring terminal to a suitable ground. E.g. metallic column or enclosure earth point.

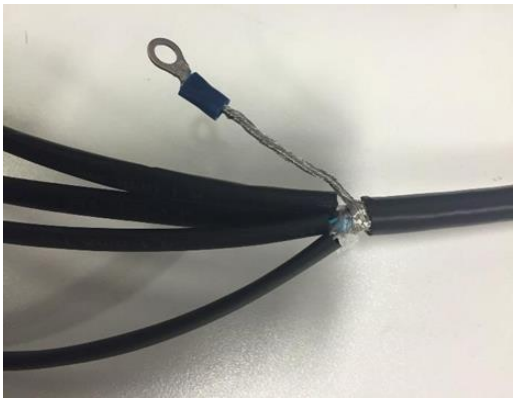


Figure 34 Drain Wire

11.7 Interface Adaptor Box

The Interface Adaptor Box (IAB) is designed to provide an interface between the Universal cable used on older generation Neology cameras and the cabling for P500.

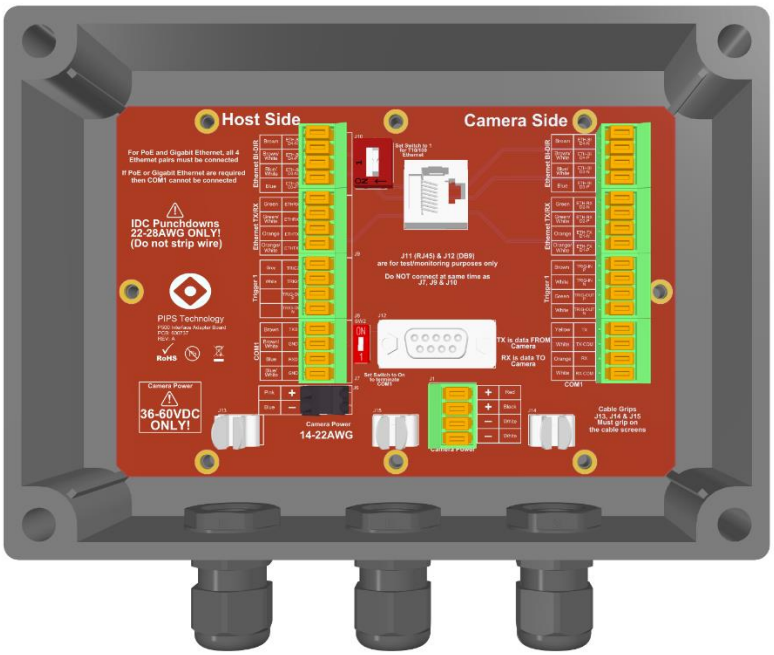


Figure 35 Interface Adaptor Box

The universal cable should be installed using the cable gland on the left and connected into the Host Side connectors. The cable should be stripped to expose the screen, and then clamped into clamp J13. The PCB silkscreen shows the full wiring information, the two power wires need to be stripped before screwing into the terminals, the other connections are all IDC punch down types, so the wire should not be stripped.

The camera cables should use the other cable glands, and again the cable clamps on the PCB should clamp onto the exposed cable screens. If both cables are used then the Power/Com1 cable should use the cable gland on the right, and the Ethernet cable using the central gland. If just using a single cable with PoE then the cable can use the right-side gland.

The RJ45 and DB9 connectors (J11 & J12) are there to aid with debugging and should not be used if the Ethernet or Serial is also connected on the host side connectors.

If the Universal cable is being used for PoE or Gigabit Ethernet, then the 4 wires normally used for the serial connection must then be re-purposed for Ethernet.

The IAB comes with a bracket to allow it to be pole mounted, when mounting, the side with the glands should be facing down so as to prevent water ingress.

12. Camera Maintenance

The P500 camera system is designed for minimal maintenance. It is recommended that you check and clean the camera every six months for optimum performance.

Maintenance tasks include the following:

- Cleaning the front window of the camera with clean water and a lint free cloth. If you have very hard water, you may find de-ionised water helps prevent streaking. You can use a small amount of detergent if you have grease on the window.
- Checking inside the camera's hood for any foreign objects and remove them.
- Checking the camera for alignment. You may wish to perform a site acceptance test (SAT) to check performance.
- Checking and tighten all brackets, fittings and cables.
- Checking the bracket, camera, cables and power supply for damage or wear and replace as necessary.
- Checking that communications links to and from the camera work as expected.
- Check the output voltage of the Camera PSU is 48VDC. PSU performance can degrade over time.