



216/316 USER GUIDE

IRIS

Contents:

PAGE	SECTION	
3	1.01	INTRODUCTION
3	1.02	MANUAL VALIDITY
3	1.03	DETECTION RANGES
3	1.04	CONVENTIONS
3	1.05	IMPORTANT WARRANTY INFORMATION
4	2.01	WARNINGS & IMPORTANT PRODUCT INFORMATION
5	3.01	TYPICAL SYSTEM EXAMPLES
6	4.01	CAMERA CONTROL DATA
6	4.02	CABLING REQUIREMENTS
6	4.03	SETTING CAMERA ADDRESS
6	4.04	INSTALLATION CONSIDERATIONS
6	4.05	PROTOCOL INFORMATION
7	5.01	HARDWARE INSTALLATION
9	6.01	CONNECTIONS
9	6.02	VIDEO CONNECTIONS
9	6.03	DATA CONNECTIONS
9	6.04	POWERING UP
10	7.01	CONTROLLING THE CAMERA
12	8.01	PROTOCOL LIST
14	9.01	CAMERA ADDRESS TABLE
15	10.01	SPECIFICATIONS
16	-	BACK COVER / CONTACT DETAILS

1.01 Introduction

IRIS216 and IRIS316 Thermal Imaging PTZ cameras convert heat emitted and reflected from objects into a detailed visual image. This means they can be used to provide visibility in absolute zero light conditions.

They provide an incredibly powerful method to help navigate at night and in low light or poor visibility conditions. Any changes in temperature greater than 50mK are detected, meaning it's possible to observe reflections of objects, footprints after a person has left the area or even the texture of snow and ice.

A powerful sensor known as a Micro-bolometer picks up the long range infra red waveforms omitted and reflected by all objects and converts them into electrical signals which are used to build up a visual screen. The amount of pixels on the sensor and their proximity to each other determine the sensitivity of the unit and the resolution of the picture. The IRIS216 has a 384x288 resolution and the IRIS316 has a 640x480 resolution. The IRIS216 is referred to as a QVGA resolution, although in fact it has 44% more pixels than a standard QVGA image. The IRIS316 is referred to as a VGA camera. Both cameras have a pixel pitch of 17µm.

Iris thermal imaging cameras are perfect additions to both leisure marine and commercial marine navigational and situational awareness set-ups. They are also used widely by the military and emergency services. Iris Thermal cameras are feature rich, high quality situational awareness and night vision tools. Because the wavelengths used are twenty times longer than the wavelengths in the visible part of the spectrum, the radiation undergoes less scattering by particles in the atmosphere and as a result, visibility through smoke, mist and fog can also be improved.

Iris Innovations range of Thermal Imaging cameras employ cutting edge technology to enhance on board safety and security in a variety of ways never seen before in the marine industry. Key features include:

- Continuous 'Smooth' Digital Zoom, up to 36x
- 9 Colour Palettes, each with reverse polarity
- 5 Scene Modes offer contrast and gain settings specially designed to enhance the image in different circumstances.
- 4 Automatic Scan and Sweep Modes
- Realtime Positional Indicator
- 360° Variable Speed Continuous Rotation
- 210° Variable Speed Tilt Mode
- Auto-Flip Feature to Automatically Correct the Camera Orientation when the Tilt Passes it's Tilt Azimuth
- Video Freeze Feature
- User Programmable Pattern Tours
- IRIS216 Model features 44% Greater Resolution than Standard QVGA Cameras
- IRIS316 features 17µm Pixel Pitch for Superior Picture Clarity.
- Thermal Sensitivity <50mK
- Standard or Hanging Mounting

1.02 Manual Validity:

This manual covers the installation and operation of Iris Innovations 216 and 316 series Thermal Imaging PTZ cameras, covering the following models: IRIS216-75 (NTSC Low refresh rate(7.5Hz)), IRIS216-30 (NTSC High refresh rate(30.Hz)), IRIS216-83 (PAL Low refresh rate(8.3Hz)), IRIS216-25 (PAL High refresh rate(25Hz)), IRIS316-75 (NTSC Low refresh rate (7.5Hz)), IRIS316-30 (NTSC High refresh rate(30.Hz)), IRIS316-83 (PAL Low refresh rate(8.3Hz)), IRIS316-25 (PAL High refresh rate(25Hz))

1.03 Detection Ranges

Based on NATO criteria for Human and Typical Vessel targets. Actual range may vary depending on camera set up, environmental conditions, user experience and type of monitor or display used.

Model	IRIS216	IRIS316
Resolution & Pitch	384x288~25micron	640x480~17micron
Focal Length	18.5mm	25mm
HFOV	29.1°	24.6°
Person	1.8m H x 0.5m W	1.8m H x 0.5m W
Detection	454 Meters	897 Meters
Recognition	114 Meters	224 Meters
Identification	57 Meters	112 Meters
Boat / Vehicle	2.3m H x 2.3m W	2.3m H x 2.3m W
Detection	1289 Meters	2546 Meters
Recognition	322 Meters	637 Meters
Identification	161 Meters	318 Meters

1.04 Important Warranty Information.

This product is covered by a 1 year return to base warranty valid from date of purchase. To qualify for an additional year warranty free of charge beginning at the end of the original warranty period and learn more about the terms and conditions of the warranty, register your product at www.boat-cameras.com

1.04 Conventions:

At various points within this guide, the following icons will be used to illustrate important or potentially dangerous information:



WARNING

This symbol indicates a risk of damaging the camera or other items or an important issue that may effect the operation of the camera.



INFORMATION

This symbol points out important information pertaining to the installation, operation and maintenance of the camera.



DANGER

This symbols alerts the user of a serious risk of damage or personal injury or death.

2.01 Warnings & Important Product Information

WARNING: Installation and Operation

This product must be installed and operated in accordance with these instructions. Failure to do so may result in poor product performance, damage to the product or vessel and or personal injury. Installation should only be carried out by qualified personnel or by persons competent in electrical systems.

WARNING: Power Supply and Grounding



Ensure the boats power supply is switched off during installation. Ensure suitably rated circuit breakers / fuses are used in the installation of the product in accordance with the electrical values shown in the technical specifications of the product. Never switch on power until the power connections are correctly terminated in accordance with the information provided in this document. Do not connect or disconnect the product with the power supply switched on. Never disconnect the DC ground with the power supply on.

WARNING: Wiring terminations



Where the products video, power and data terminations are extended, ensure that suitable connectors are used and that the point of termination for each cable is adequately protected against moisture ingress. Ensure correct polarity is strictly observed. Do not cut or remove cable connectors without prior permission from Iris Innovations Limited.

WARNING: Do Not Open the Unit



There are no user serviceable parts within the product so there is no need to open the device other than temporarily removing the Camera Address DIP Switch window whilst setting addresses. Ensure the DIP switch window is correctly replaced and that the rubber seal is not lost, pinched or damaged. The product has been certified to IP66 standards, however, submersion or the product or exposure to high pressure washing will invalidate the warranty.

WARNING: Disclaimer



This product is intended to be used only as an aid to navigation and must never be used as an alternative to correct navigational practices and judgements made on the basis of approved navigation methods. It is the users responsibility to observe correct and proper navigational skill when using this product. Only officially approved charts and notices to mariners contain the current information required for safe navigation.

Operating the camera or viewing the video input whilst the vessel is moving could cause a distraction and result in accidental collision resulting in property damage, injury or death. Iris Innovations cannot be held liable for any incidental, special, indirect or consequential damages whether resulting from the use, misuse or inability to use this product.

CAUTION: Service and Maintenance

This product contains no user serviceable parts. Please refer all maintenance and repair issues to your authorized Iris Innovations dealer. Any unauthorized work to the product may affect the warranty.

CAUTION: Care and Cleaning

This product is a sensitive piece of electronic, imaging equipment and must be handled and treated accordingly. Do not drop or shake the unit during installation. Never manually alter the pan or tilt position whilst the power to the unit is on as this may permanently damage the motors. Avoid exposure of the imager to direct sunlight where possible as this may degrade the cameras performance over time.

When cleaning the device, ensure power is switched off to avoid unintentional movement of the cameras motors. Clean the camera housing with a soft cloth. Moisten the cloth and use a mild detergent if required but take care not to get detergent on the lens window. The lens window has a protective coating which may suffer damage as a result of improper cleaning. To clean the lens window use a soft cotton cloth. Moisten with clean water if necessary. For further advice on cleaning the lens window, contact Iris Innovations.



CAUTION: Export Controls

Variants of this product with a refresh rate in excess of 9Hz are considered to be of Dual Use by various International Export Control Authorities and may also fall under export regulations in other countries. Failure to observe export controls have serious consequences and could even result in criminal proceedings. The UK Export List Classification for products within this range with a refresh rate in excess of 9Hz is 6A003b4b. Considerations to export control legislation must also be made when re-exporting from licensed or exempt regions. These products are controlled for export under US Department of Commerce (DOC), Export Administration Regulations (EAR), Export Control Classification Number (ECCN) 6A003.b.4.b. These cameras contain a focal plane array controlled to 6A002.a.3.f. U.S. Government authorization may be required for all destinations except Canada.



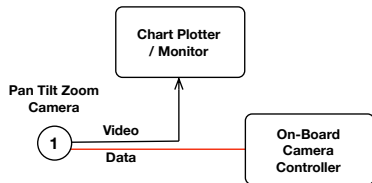
INFORMATION: Product Disposal and Recycling

Dispose of this product in accordance with the WEEE Directive. The Waste Electrical and Electronic Equipment (WEEE) Directive requires the recycling of waste electronic and electrical equipment. Iris Innovations supports the WEEE policy and politely request you observe correct disposal methods. For further information on how to correctly dispose of this product please contact Iris Innovations.

Please recycle unwanted packaging and documentation. The cardboard carton, all paper manuals and documents and the protective plastic bag in which the camera is shipped are widely recyclable. Please check with your local recycling plant for confirmation.

3.01 Examples of Typical Systems

A basic configuration will consist of a single camera, a camera controller and a viewing medium (either a dedicated video monitor or a multi-functional display (MFD)). The video feed from the camera is routed directly into the MFD, and the control data from the joystick is sent directly to the camera.



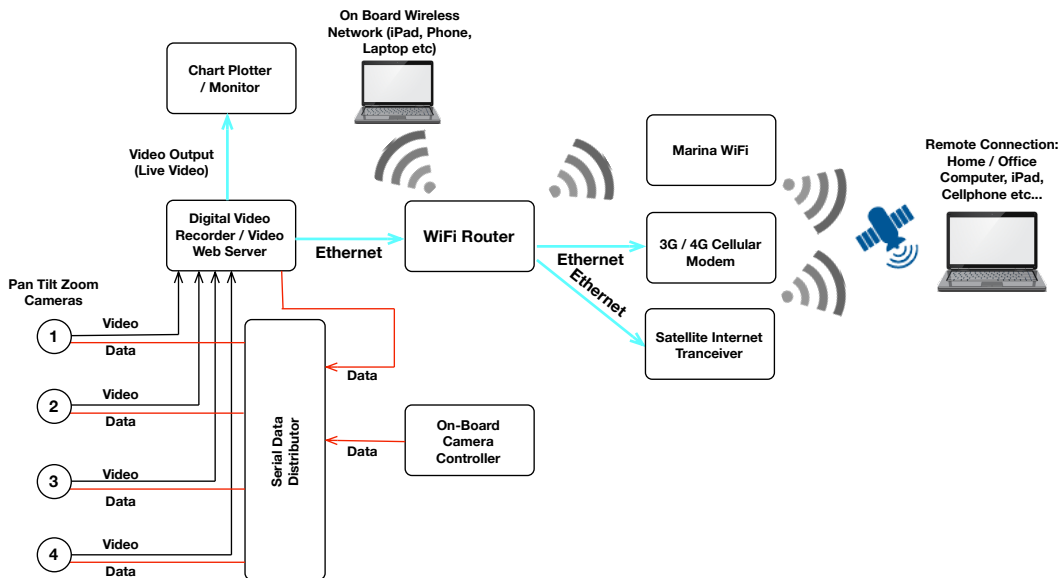
Simple Camera to Monitor (Chart-Plotter) Set Up

Systems become more complicated where there are multiple cameras, monitors and/or controllers and where more complex video and data transmission methods are employed such as wireless or Internet Protocol (IP) conversions. The diagrams below detail a number of different connection configurations.

In theory it is possible to have up to 255 controllable devices in a system (cameras or controllers) and unlimited fixed cameras, but this is obviously dependent on the video switching equipment installed, the camera control data management and/or the vessels on board LAN - and of course the size of the vessel!

The key issue when installing multiple controllable cameras is that they have individual addresses (see below). A popular configuration would be something along the lines of 2 x controllable cameras, 4 x fixed (static) cameras and 2 x controllers. This would mean that the number of video inputs required would exceed the amount of inputs offered by most chart plotters and so a video switcher (such as the IRIS606 c Camera switcher) would be required. Video from each camera is routed into the video switcher and the output from the switcher is then routed into a single input of the chart plotter. Switching is controlled by a dedicated waterproof keypad connected to the switcher. The data wires from each of the controllable cameras, along with the data wires from the two controllers would then need to be routed into a Serial Data Distributor (also known as an Expander), such as the IRIS EXP0204. This simplifies installation and prevents 'cross-talk' and 'reflections' and the data line that can result in poor camera control and 'over-runs'. Full specifications for ancillary equipment such as video switchers and data expanders can be found at www.boat-cameras.com

Complex Setup Depicting Local (On Board) Functionality & Remote Functionality



4.01 Camera Control Data

IRIS216/316 cameras are controlled via an RS485 serial data connection, using a variant of the Pelco-D CCTV camera control protocol. The Pelco-D protocol was designed to provide accurate controls for a wide range of standard CCTV features, such as pan, tilt, user preset features etc, but do not include features specific to thermal imaging cameras and other extended features supported by Iris cameras. Because of this, Iris have mapped their product specific features to certain user preset commands and to other modified Pelco-D commands. This means that Iris thermal PTZ cameras can be controlled either by a dedicated Iris joystick controller such as the IRIS516 or IRIS507, as well as other control devices, such as compatible chart-plotters, multi-functional displays and third party joysticks. For further information on compatible third party control interfacing please contact Iris Innovations. For certain third party interfacing, additional serial protocol convertors may be required where NMEA0183 or NMEA2000 connections are used.

4.02 Cabling Requirements

The camera has a 3 meter tail into which a 50cm breakout cable is connected. The breakout tail has the following connections: Video (female 75Ω BNC connector), Data (2 x bare wires: RS485+ (RED wire) and RS485- (Black wire)) and Power (2.5mm DC Barrel Jack connector). Individual video, data and power cables can be run back to the control position and power distribution position or a combination cable (such as IRIS-COMBPTZ-xx) can be used. Alternatively, an Active Video Balun set can be used to allow a single CAT5 cable to be run. Please note however that although Baluns facilitate the use of CAT5 cables, these should on no account be routed through ethernet routing and switching hardware as this will cause permanent damage. If Baluns are used, ensure the CAT5 cables are managed completely separately from your IP network. Contact Iris Innovations for further details.

Video cables need to be coaxial with an impedance of 75Ω such as RG59, URM70 or similar.

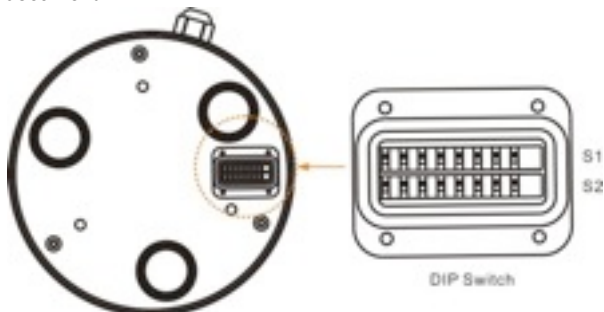
Power cables need to be 2 core DC cable rated at 5A (maximum voltage 36VDC)

Data Cables need to be twisted pair Belden style data cables (0.5mm) or equivalent.

4.03 Setting Camera Address

Each camera must have it's own unique address so that only control data intended for that camera is received and processed by the camera. If multiple cameras had the same address, they would all move together when pan and tilt commands are transmitted.

To set the camera address, remove the DIP switch cover plate on the base of the camera with a small cross-head screw driver, taking care not to loose the 4 screws or the rubber 'O' seal, and set the DIP switches on switch bank 1 accordingly. A table detailing the switch settings can be found at the end of this document.



Once the desired address has been set, carefully replace the DIP switch cover plate.

4.04 Installation Considerations



It's important to fully consider the intended position of the camera and the desired fields of view prior to installation, in terms of how you are going to get cables to the position, will the camera be able to see the appropriate areas, will the camera interfere with any other fixture such as a doorway or walkway once it's fixed in place, or are there any obstructions behind the surface onto which the camera is to be installed. It's strongly recommended that if possible the camera should be temporarily powered up prior to final installation and offered into position so that these factors can be considered and any possible issue can be addressed before holes are drilled and difficult, time consuming and costly cable runs are attempted. Check third party hardware to ensure it doesn't effect the operation of the camera and vice versa.

4.05 Protocol Information



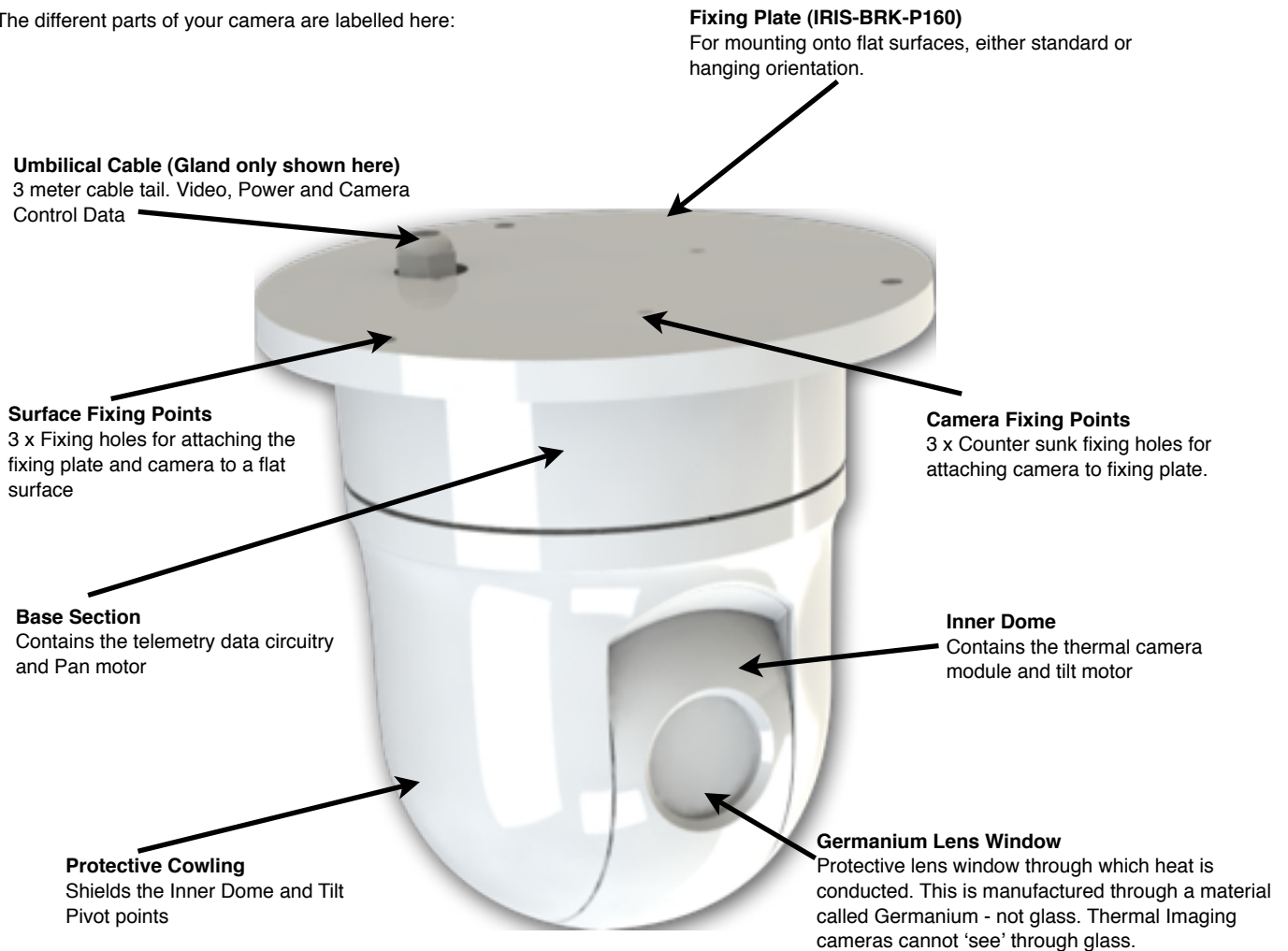
DIP switch bank 2 is reserved for setting the baud rate and protocol details. This is factory set to 9600 Baud, Pelco-D Protocol, N-8-1 (No Parity Bits, 8 Data Bits, 1 Stop Bit). Do not attempt to change these settings as they are locked. Changing the settings of Switch bank 2 could result in the camera not responding to data commands.

Full details of the Pelco-D control protocol can be found at www.pelco.com.

As well as the standard Pelco-D command set, Iris cameras use their own commands based on the Pelco protocol to call features that are specific to the model or are not covered by the Pelco command set. For further details contact Iris Innovations.

5.01 Hardware Installation

The different parts of your camera are labelled here:



IRIS216 / 316 Thermal Imaging PTZ (Shown with BRK-P160 Fixing Plate in 'Hanging' Orientation).

This style of housing from Iris is known as the 116 Series housing.

Once you've established a suitable fixing position, use the fixing plate as a template to mark off the three Surface Fixing Positions and the cable clearance position.

The camera is supplied with 3 x Stainless Steel, anti-tamper, self tapping screws. Drill pilot holes accordingly and use a 14mm hole saw to create the cable entry hole.

Attach the camera to it's base plate using the M5 x 10mm Countersunk screws supplied. Iris recommend that a screw fixing agent is used to strengthen the fit (see diagram below).

When the cables are correctly terminated (see next section), offer the camera up into the fixing position and firmly screw into place.



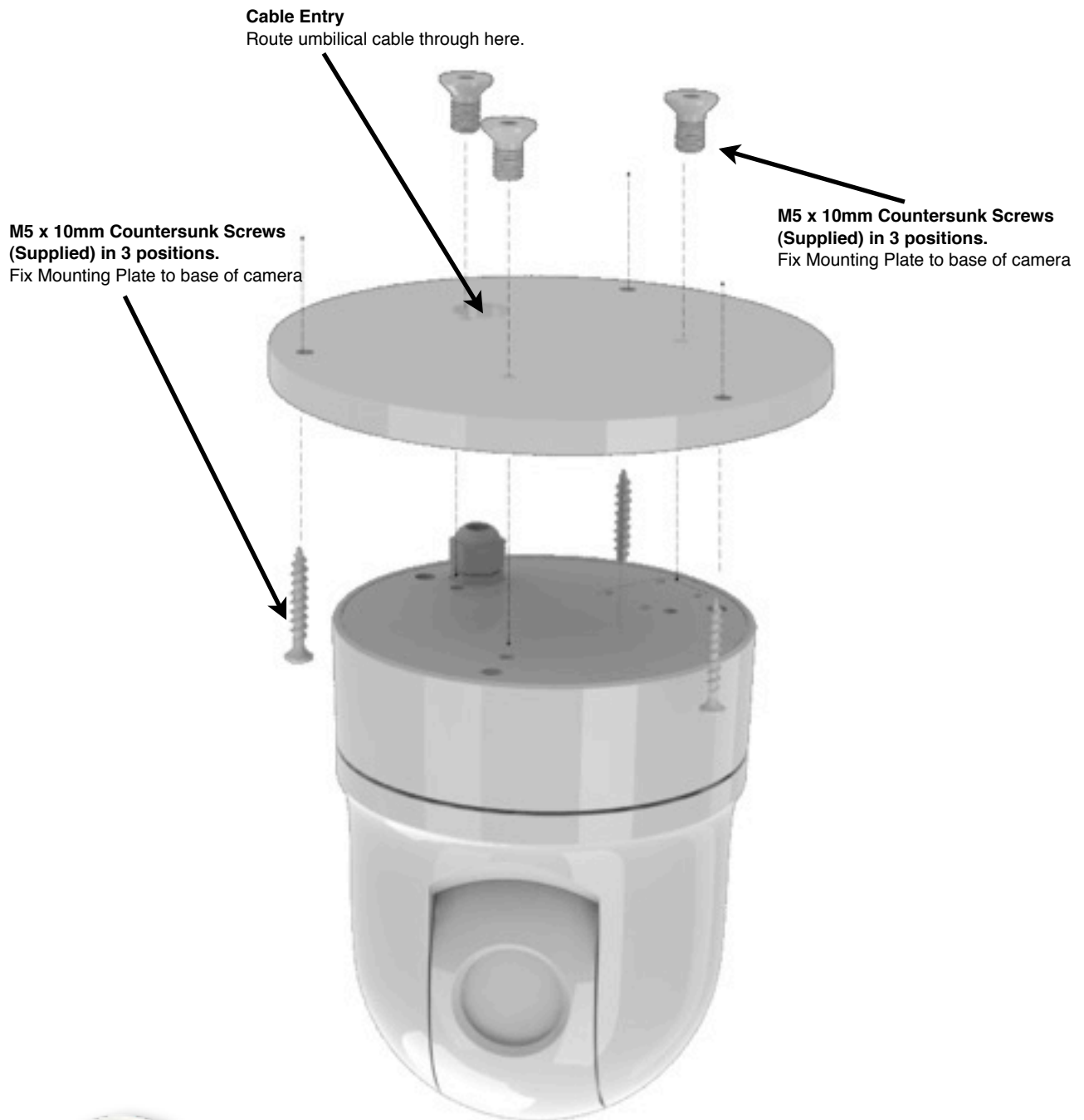
Observe extreme caution when siting the camera. Ensure the act of drilling the pilot holes and cable entry hole does not infringe any cables, equipment or fixtures behind the panel onto which the camera is to be installed.



To avoid moisture ingress between the bottom of the BRK-P160 fixing plate and the surface onto which the camera is to be attached, apply a bead of suitable silicone sealant around the edge of the plate to create a seal.

Hardware Installation

Fix camera to mounting plate, routing umbilical cable through cable entry, then fix mounting plate to surface. Camera can be installed either in the hanging orientation as shown below, or in the 'desktop' orientation as shown in the inset.

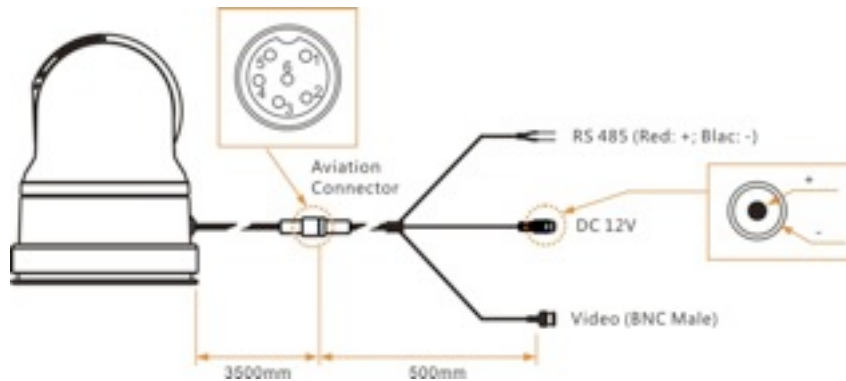


Standard (or 'Desktop') Orientation

The camera is factory set for installation in the 'Standard' orientation as shown here. To install in the hanging orientation as shown in the main image above, ensure the camera's video output has been set to vertical flip. This can either be done via your controller or via the DIP switches. Details are provided later in this document.

6.01 Connections

As shown in the diagram below, a 3.5 meter 'umbilical' cable tail extends from the base of the camera and is terminated with a water resistant circular 'Aviation' connector. Into this connects a 500mm 'Breakout' lead, which has three separate tails as shown. One for Video, one for DC 12V Power, and a third for RS485 Serial Data connection.



Pin Definition	
Pin #	Definition
1	Video +
2	Power -
3	Power +
4	RS485 -
5	RS485 +
6	Video -

6.02 Video Connections

The camera breakout tail features a male BNC connector for the video signal. When using coaxial video extension cables that are usually also supplied with a male BNC connector, a BNC 'Thru-piece' adapter can be used to connect the two cables together. The camera has a composite video output (1VP~P / 75Ω). Ensure appropriate extension cables are used for this specification. Contact Iris Innovations for further information if you are unsure which cable to use.

Many Multifunctional Displays (MFD's) / Chart Plotters use RCA (Phono) jacks for video inputs. In this case use a female BNC to Phone Jack (Male) adapter. These are available from Iris Innovations and can also be sourced from any good home electronics / AV suppliers.

Video from Iris cameras can be viewed on most leading manufacturers MFD / Chart Plotter products.

6.03 Data Connections



Ensure correct polarity is observed when connecting the RS485 serial data wires that provide control of the camera. Wires are labelled RS485+ (Red) and RS485- (Black) for convenience. The Transmit line (RS485+) should be connected to the Receive line (RS485-) and vice versa. If, once connected you have no control, reverse the polarity of the data wires as this is a common error made during installations. Never connect the RS485 wires to a power source as this could permanently damage the camera or controller. Observe care when connecting as the RS485 wires are coloured red and black and could be confused for DC power lines.

Even if the cable connections are made in an internal location or in an area that wouldn't usually be exposed to moisture, it is recommended that the connections are protected from any possible erosion or salt water / salt atmosphere conditions by wrapping the terminations in a suitable tape of covering.

6.04 Powering Up



Upon switching on the circuit breaker that isolates the camera, the unit will perform an initialization routine. During this routine, which lasts approximately 30 seconds, the camera will pan and tilt automatically in order to calibrate itself. You will notice the mechanical shutter 'wiping' the image frequently for the first few minutes as the unit warms up. This will eventually settle into an automatic interval of wiping approximately every 15 minutes. This only lasts for a fraction of a second and allows the camera to calibrate itself for the best possible image in accordance with the ambient temperature.



Never apply power to the camera unless all connections are terminated correctly. Never disconnect the DC ground for any reason whilst the camera is powered up.

When the camera has completed its boot-up routine, a text overlay table will appear in the screen displaying the camera address, protocol, baud rate and current firmware version. You will also notice the positional indicator icon in the bottom left hand corner of the screen and the zoom bar at the center bottom of the screen. When this message appears the camera is ready to use and you are able to control the device.

7.01 Controlling the Camera

Your camera features positional controls and extended features. Positional features such as Pan, Tilt and Zoom are usually controlled via a compatible joystick controller, such as the IRIS516 or IRIS507 controllers or via a compatible MFD / Chart-Plotter - sometimes via touch-screen controls depending on the make and model. Third party control methods may differ from Iris controllers. For details of compatible third party control interfaces please contact Iris Innovations. Control of extended features depends on the type of controller you are using, but is usually accessed via a menu system on the controller or third party device (MFD / Chart-plotter etc). If using a third party control interface consult the relevant user documentation for the specific equipment for details.

A list of feature commands is included at the end of this document.

Set-Up Features

The following features will only usually be called during the initial set-up of the camera following installation:

- **Video Standard Set-up.**
PAL / NTSC

When changing the video standard, power the unit down and then reboot for the adjustment to take place.

- **Video Orientation**
UP / DOWN / UP+MIRROR / DOWN+MIRROR

Setting the vertical orientation (UP or DOWN) is determined by the orientation of the camera (Standard = UP / Hanging (also known as Ball Down) = DOWN). The mirror option is usually only used when the camera is facing aft, and is usually only applied to fixed cameras, as with a PTZ camera such as the 216 or 316, the camera pan position is frequently changing. Video orientation can however easily be 'flipped' as required with the IRIS516 controller.

- **Set Home Position**

This feature lets you set the home position of the camera following install. Usually this is aligned with the bow of the boat. This calibrates the positional indicator with the direction of the camera.

Proportional Speed Control (Pan / Tilt / Zoom)

IRIS216/316 Thermal Cameras feature extremely accurate multi-speed control with a Proportional Speed function that acts like a gear in order to automatically control speed ratios in accordance with the current level of zoom. The further the camera is zoomed in, the slower it will pan and tilt when commanded and vice versa. This greatly improves control accuracy when zoomed in.

Auto-Flip

When the camera is tilted past its azimuth the Auto-Flip feature is triggered. This automatically pans the camera through 180° at full speed (Proportional Control is disabled during this procedure) to the original pan position and continues the tilt movement as long as the camera is still being tilted. This corrects the orientation of the camera module as if the unit kept tilting past the azimuth without the automatic correction, the module would be upside down.

Extended Features

Colour Palette Select:

Iris 216 / 316 Thermal Cameras feature multiple colour palettes which can be used in different conditions and situations to enhance the image.

- Monochrome (White Hot)
- Red Scale (Red Hot)
- Green Scale (Green Hot)
- Blue Scale (Blue Hot)
- Iron Bow
- Rainbow
- Hot Metal
- High Contrast
- Isotherm

Colour Palette Inverse:

The polarity of the 9 palettes above is reversible providing a total of 18 colour palettes.

Scene Mode Select:

5 different preset 'Scene Modes' are provided to enhance the image in the following conditions:

- **Day Mode**
Default mode. Handles wide thermal dynamic range while maintaining optimum picture quality.
- **Night Mode**
Normal level/span. Suitable to provide verification of vessels/buoys observed with radar or navigation lights. The camera handles hot objects in the scene i.e vessel exhausts and personnel on board decks (of other vessels being viewed), without losing detail of low contrast areas.
- **Marina Mode**
Ability to distinguish low contrast objects i.e. marina pontoons, moorings etc. without hot objects in the field of view affecting picture i.e. persons, vehicles on-shore/dock or heat from power boats engines.
- **Man-Over-Board Mode**
Maximum sensitivity and discrimination of low contrast targets/objects. Hot spot tracker (MOB) enabled.
- **Fog Mode**
Maximum sensitivity and discrimination of low contrast targets/objects.

Video Pause

Freezes / Unfreezes the image in order to study an on screen artifact.

Non Uniformity Correction Control (NUC)

Manually operates shutter in order to recalibrate the thermal sensitivity. When the shutter closes, the camera re-calibrates it's temperature threshold to the uniform temperature of the shutter. Non Uniformity Correction (or NUC'ing) also occurs automatically to maintain a sharp image.

User Presets

The camera has a built in memory that can be used to store up to 100 user 'preset' positions. A preset allows you to move the camera to a favourite or important position and learn that position so that the camera can be instructed to move at top speed to that position at the touch of a button. For example, you may want to point the camera so that it's facing directly aft so you can take a look at what's coming up behind you. By saving this position as a Preset, you can send the camera back to this position immediately by recalling the preset. Presets can also be used to form 'Tours', where the camera can be instructed to step through each preset within the Tour in sequence with a pre-determined dwell time between each position.

User presets are numbered 100-199. Usually the controller you are using will have the ability to SET a Preset to learn the position and then CALL a Preset to send the camera to that position. This will depend on the model of controller you are using. Consult the user guide of your controller for details.

System Presets

Certain functions of the camera that are not defined by the Pelco-D Protocol are called by using Presets. A list of System Presets can be found later in this document.

Scan Modes

The camera supports 4 different Scan Modes. Once activated, tilt and zoom commands are still accepted by the camera but you will not be able to pan the camera until the Scan has been Stopped:

- **45° Auto Scan**
Camera pans back and forth 22.5° either side of the centre point (the position the camera is facing when the scan is activated).
- **90° Auto Scan**
Camera pans back and forth 45° either side of the centre point (the position the camera is facing when the scan is activated).
- **180° Auto Scan**
Camera pans back and forth 90° either side of the centre point (the position the camera is facing when the scan is activated).
- **360° Auto Scan**
Camera pans continuously through 360°, pausing every 108°.

There are three speed controls for each Scan. Slow, Medium and Fast.

A command is also available to 'Re-Centre' the scan. This can be found in the command list.

Tours

A tour is a group of 10 user preset positions that are linked together so that when activated, the camera will sequence to each position with a 5 second dwell time between each preset. There are 4 Tour patterns available. Each tour uses a range of dedicated presets which must be set. Any unused presets won't be included in the tour. Reserved Tour presets are listed here:

Tour 1

Preset Range 40 ~ 49

(Preset 84 Activates Tour 1)

Tour 2

Preset Range 50 ~ 59

(Preset 85 Activates Tour 2)

Tour 3

Preset Range 60 ~ 69

(Preset 86 Activates Tour 3)

Tour 4

Preset Range 70 ~ 79

(Preset 87 Activates Tour 4)

8.01 Protocol Command List

The table below lists features specific to IRIS216/316 Thermal Cameras that are not covered by the standard Pelco-D protocol and the commands that have been mapped in IRIS camera software to operate those features. Values are shown in hexadecimal. The checksum for all Pelco-D commands is the 8 bit (modulo 256) sum of the payload bytes (bytes 2 ~ 6) within the message. Refer to the Pelco-D protocol document for further information.

Function	Value	Command	H	Add	C1	C2	D1	D2	CHK
Video Standard	PAL	Preset xx	FF	AD	00	07	00	C7	CHK
	NTSC	Preset xx	FF	AD	00	07	00	C8	CHK
Video Orientation	Desktop Standard	Preset 236	FF	AD	00	07	00	EC	CHK
	Hanging Standard	Preset 237	FF	AD	00	07	00	ED	CHK
	Desktop Mirror	Preset 238	FF	AD	00	07	00	EE	CHK
	Hanging Mirror	Preset 239	FF	AD	00	07	00	EF	CHK
Set New Home Position	Set Home	Set Home	FF	AD	00	49	00	00	CHK
Call Home Position	Call Home	Preset 230	FF	AD	00	07	00	E6	CHK
Thermal Colour Palettes	Mono / White Hot	Preset 201	FF	AD	00	07	00	C9	CHK
	Mono / Black Hot	Preset 202	FF	AD	00	07	00	CA	CHK
	Redscale / Red Hot	Preset 203	FF	AD	00	07	00	CB	CHK
	Redscale / Black Hot	Preset 204	FF	AD	00	07	00	CC	CHK
	Ironbow	Preset 205	FF	AD	00	07	00	CD	CHK
	Reverse Ironbow	Preset 206	FF	AD	00	07	00	CE	CHK
	Greenscale / Green Hot	Preset 207	FF	AD	00	07	00	CF	CHK
	Greenscale / Black Hot	Preset 208	FF	AD	00	07	00	D0	CHK
	Rainbow	Preset 209	FF	AD	00	07	00	D1	CHK
	Reverse Rainbow	Preset 210	FF	AD	00	07	00	D2	CHK
	Hot Metal	Preset 211	FF	AD	00	07	00	D3	CHK
	Reverse Hot Metal	Preset 212	FF	AD	00	07	00	D4	CHK
	Isotherm	Preset 213	FF	AD	00	07	00	D5	CHK
	Reverse Isotherm	Preset 214	FF	AD	00	07	00	D6	CHK
	High Contrast	Preset 215	FF	AD	00	07	00	D7	CHK
	Reverse High Contrast	Preset 216	FF	AD	00	07	00	D8	CHK
	Bluescale / Blue Hot	Preset 217	FF	AD	00	07	00	D9	CHK
	Bluescale / Black Hot	Preset 218	FF	AD	00	07	00	DA	CHK
Non Uniformity Correction (NUC)	NUC	Preset 240	FF	AD	00	07	00	F0	CHK
45° Auto Scan	Slow	Scan 45 Slow	FF	AD	00	39	04	01	CHK
	Medium	Scan 45 Med	FF	AD	00	39	04	01	CHK
	Fast	Scan 45 Fast	FF	AD	00	39	04	01	CHK

Function	Value	Command	H	Add	C1	C2	D1	D2	CHK
90° Auto Scan	Slow	Scan 90 Slow	FF	AD	00	39	01	01	CHK
	Medium	Scan 90 Med	FF	AD	00	39	01	01	CHK
	Fast	Scan 90 Fast	FF	AD	00	39	01	01	CHK
180° Auto Scan	Slow	Scan 180 Slow	FF	AD	00	39	02	01	CHK
	Medium	Scan 180 Med	FF	AD	00	39	02	01	CHK
	Fast	Scan 180 Fast	FF	AD	00	39	02	01	CHK
360° Auto Scan	Slow	Scan 360 Slow	FF	AD	00	39	03	01	CHK
	Medium	Scan 360 Med	FF	AD	00	39	03	01	CHK
	Fast	Scan 360 Fast	FF	AD	00	39	03	01	CHK
Stop Scan	Stop Scan	Preset 97	FF	AD	00	07	00	61	CHK
Set Camera Safe Position	Set Safe	Set Preset 232	FF	AD	00	03	00	E8	CHK
Call Camera Safe Position	Call Safe	Preset 232	FF	AD	00	07	00	E8	CHK
Freeze Image	Freeze	Preset 234	FF	AD	00	07	00	EA	CHK
Un-Freeze Image	Resume	Preset 235	FF	AD	00	07	00	EB	CHK
Scene Mode	Off	Preset 220	FF	AD	00	07	00	DC	CHK
	Day	Preset 221	FF	AD	00	07	00	DD	CHK
	Night	Preset 222	FF	AD	00	07	00	DE	CHK
	Fog	Preset 223	FF	AD	00	07	00	DF	CHK
	Man Over Board	Preset 224	FF	AD	00	07	00	E0	CHK
	Marina	Preset 225	FF	AD	00	07	00	E1	CHK
Start Tour	Tour 1	Preset 84	FF	AD	00	07	00	54	CHK
	Tour 2	Preset 85	FF	AD	00	07	00	55	CHK
	Tour 3	Preset 86	FF	AD	00	07	00	56	CHK
	Tour 4	Preset 87	FF	AD	00	07	00	57	CHK

9.01 Camera Address Table

The cameras unique device address is set using DIP switch Bank 1. The following table lists switch positions for each address from 0~38. There are a total of 255 address positions available. For address settings above 38 please contact Iris Innovations technical support.

Do not use address 0 as this is rarely used by control equipment.

ADDRESS	1	2	3	4	5	6	7	8
0	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
3	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
4	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
5	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF
6	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF
7	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
8	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
9	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF
10	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF
11	ON	ON	OFF	ON	OFF	OFF	OFF	OFF
12	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF
13	ON	OFF	ON	ON	OFF	OFF	OFF	OFF
14	OFF	ON	ON	ON	OFF	OFF	OFF	OFF
15	ON	ON	ON	ON	OFF	OFF	OFF	OFF
16	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
17	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF
18	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF
19	ON	ON	OFF	OFF	ON	OFF	OFF	OFF
20	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF
21	ON	OFF	ON	OFF	ON	OFF	OFF	OFF
22	OFF	ON	ON	OFF	ON	OFF	OFF	OFF
23	ON	ON	ON	OFF	ON	OFF	OFF	OFF
24	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF
25	ON	OFF	OFF	ON	ON	OFF	OFF	OFF
26	OFF	ON	OFF	ON	ON	OFF	OFF	OFF
27	ON	ON	OFF	ON	ON	OFF	OFF	OFF
28	OFF	OFF	ON	ON	ON	OFF	OFF	OFF
29	ON	OFF	ON	ON	ON	OFF	OFF	OFF
30	OFF	ON	ON	ON	ON	OFF	OFF	OFF
31	ON	ON	ON	ON	ON	OFF	OFF	OFF
32	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF
33	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF
34	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
35	ON	ON	OFF	OFF	OFF	ON	OFF	OFF
36	OFF	OFF	ON	OFF	OFF	ON	OFF	OFF
37	ON	OFF	ON	OFF	OFF	ON	OFF	OFF
38	OFF	ON	ON	OFF	OFF	ON	OFF	OFF

Specifications

	IRIS216 - L	IRIS216 - H	IRIS316 - L	IRIS316 - H
Video System	PAL/NTSC Switchable		PAL/NTSC Switchable	
Image Sensor	IRIS384 ASi Microbolometer		IRIS640 ASi Microbolometer	
Resolution	384 x 288		640 x 480	
TV Lines	-			
Total Effective Pixels	110,592		307,200	
Refresh Rate	8.3Hz PAL / 7.5Hz NTSC	25Hz PAL / 30Hz NTSC	8.3Hz PAL / 7.5Hz NTSC	25Hz PAL / 30Hz NTSC
Spectral Response	8~14µm		8~12µm	
Pixel Size	25µm		17µm	
Lens	Fixed 18.5mm		Fixed 35mm	
Optical Zoom	NA			
Digital Zoom	Continuous 'Smooth' Zoom 1x ~ 36x			
Horizontal Field of View	28.0°		17.4°	
Vertical Field of View	21.3°		13.2°	
Diagonal Field of View	34°		21.4°	
HIFOV	1.27mrad		0.474mrad	
VIFOV	1.29mrad		0.479mrad	
Detection on 2.3m Target	Detection: 870m / Recognition 290m		Detection: 2370m / Recognition 780m	
Minimum Illumination	0.0 lux @ 100IRE - Illumination not required			
Thermal Sensitivity	<50mK @ f/1.0		<70mK @ f/1.0	
Digital Image Stabilization	Yes		Yes	
Video Output	1.0 Vp~p Composite Video			
Image Flip	Vertical / Horizontal			
Scene Modes	Selectable: Day Mode, Night Mode, Man Over Board Mode, Fog Mode, Marina Mode			
Colour Modes	9 Reversible Colour Palettes (18 total)			
Positional Indicator	Yes			
Heater	Yes. Operates below 20°C			
Safe Position	Yes. User Definable			
Target Tracking	MOB mode applies box around hottest object in scene.			
Video Pause	Yes			
Standby Mode	Yes			
Communications Protocol	Serial Control RS485 / Pelco-D Protocol / Iris Variant			
Dimensions	163mm x 130mmØ			
Power	6VDC ~ 36VDC			
Consumption	<700mA idle / Approx 1.5A under full motor drive / <2A full motor drive & heater on			
Weight	1.132kg		1.322kg	
Environmental	IP66			
Operating Temperature	-30°C ~ 60°C			
Pan / Tilt Coverage	Pan: 360° Continuous Rotation / Tilt -15 to 90° with Auto-Flip (210° Total)			
Pan Speed (Normal)	0.05~70°/sec			
Pan Speed (Full)	0.05~220°/sec			
Tilt Speed (Normal)	0.03~38°/sec			
Tilt Speed (Full)	0.03~140°/sec			
User Presets	100 User Presets. Note: Certain presets have been assigned to camera features.			
Tours	4 User Definable Tours of 10 presets each			
Scans	Narrow Scan / Wide Scan / Random Scan / Auto Scan			
Shock & Vibe	EN60945 2002 MIL STD 810 E			
Sand & Dust	MIL STD 810 E			

Specifications and features subject to change without prior notice. E&OE

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