



# Ulysses micro

High performance compact thermal camera

Part No: ULS-M384U, ULS-M384S, ULS-M640S  
Ver 3.2

User Manual



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# 01 - Important information

## 1.1 For your safety

To prevent damage to your Omnisense Systems product or injury to yourself or others, read the following safety precautions in their entirety before using this equipment. Keep these safety instructions where all those who use the product will read them.



### **WARNING**

The consequences that could result from failure to observe the precautions listed in this section.

### **Product installation and operation**

This product must be installed and operated in accordance with the instructions provided. Failure to do so could result in injuries, damage to the vessel and/or poor product performance.

### **Corrosion**

To avoid excessive galvanic corrosion of the product, use non-metallic insulation when fitting the product directly onto stainless steel platforms/mounts, or vessels.

### **Power supply voltage**

Connecting this product to a voltage supply greater than the specified maximum rating may cause permanent damage to the unit. Refer to the technical specification for voltage rating.

### **Power supply protection**

When installing this product ensure the power source is adequately protected by using a suitably rated fuse or automatic circuit breaker.

### **Potential ignition source**

Do not use electronic equipment in the presence of flammable gas as this could result in an explosion or fire. Do not install in a hazardous/ flammable atmosphere such as engine room or near fuel tanks.

### **Entrapment hazard**

This product features moving parts that may pose potential hazards for entrapment. Keep clear of moving parts at all times.

### **Ensure safe navigation**

This product is intended only as an aid for navigational safety and must not be used as a substitute for sound navigational skills and practice. Always maintain a permanent watch while the vessel is underway. Failure to maintain a permanent watch puts yourself, your vessel and others at serious risk of harm.

### **IMO and SOLAS**

This product is intended for use on marine vessels not covered by the International Maritime Organization (IMO) and Safety of Life at Sea (SOLAS) Carriage Regulations.

### **Using the supplied cables as is**

Do not cut or extend all Omnisense Systems supplied cables unless doing so is detailed in the installation manual.

### **Do not open or disassemble**

The unit is factory sealed to protect against atmospheric humidity, suspended particulates and other contaminants. Do not open the camera turret for any reason. Disassembly of the camera turret or any unauthorized tampering can cause permanent damage to the system and will void the manufacturer's warranty.

### **Warranty registration**

To register your Omnisense Systems product ownership, please visit our website at [www.omnisense-system.com](http://www.omnisense-system.com) and register online. It is important that you register your product to receive full warranty benefits. Your unit package includes a bar code label indicating the serial number of the unit. You should retain the label for future reference.

## **1.2 Notices**

© Omnisense Systems, 2020. All rights reserved. No part of the manuals included with this product may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language in any form, by any means, without Omnisense Systems prior written permission. Names and marks appearing on the products herein are either registered trademarks or trademarks of Omnisense Systems and/or its subsidiaries. All other trademarks, trade names, or company names referenced herein are used for identification only and are the property of their respective owners.

Due to our policy of continuous product improvement, Omnisense Systems reserves the right to change the specifications of the hardware and software described in these manuals at any time and without prior notice.

Omnisense Systems will not be held liable for any damages resulting from the use of this product.

While every effort has been made to ensure that the information in these manuals is accurate and complete, we would appreciate it were you to bring any errors or omissions to the attention of the Omnisense Systems representative in your area.



In accordance with European Union (EU) Waste Electrical and Electronic Equipment Directive 2002/96/EC (WEEE), all Electrical and Electronic Equipment (EEE) products labeled with the "crossed out wheeled bin" either on the product itself or in the product literature is to be collected separately. The following applies only to users in European countries:

This product is designated for separate collection at an appropriate collection point. Do not dispose of as household waste.

Separate collection and recycling help to conserve natural resources and prevent negative consequences for human health and the environment that might result from incorrect disposal.

For more information, contact the retailer or the local authorities in charge of waste management.

## 02 - Introduction

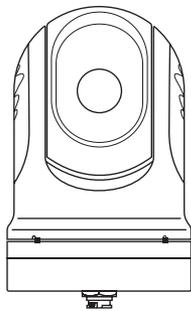
Thank you for choosing the Ulysses Micro marine thermal camera. The Ulysses Micro comes with all the components ready to install and operate in most cases, making it the most user-friendly marine thermal camera system available. The camera system is designed to integrate with many popular Multi-function Displays (MFDs), please check on our website for the latest supported brands and models. This manual will provide you with all the information you will need for installation and to familiarize yourself with the functions.

### 2.1 Document information

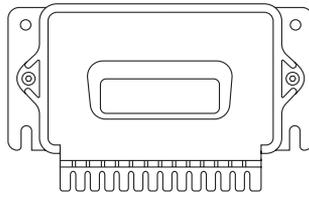
This document contains relevant information related to the installation and operation of the camera system that you have purchased. It is also available for download from our website: [www.omnisense-systems.com](http://www.omnisense-systems.com).

### 2.2 What's in the box

Ulysses Micro includes the following items:



Camera Turret



Junction Box



Camera Harness  
(33ft / 10m)



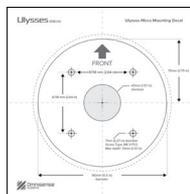
Power Cable



AV Analog  
Cable



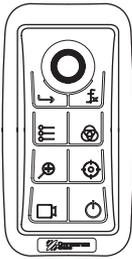
4X (M6 X 40) studs,  
washers, spring washers  
and nuts for Turret



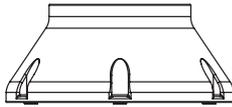
Mounting Decal for  
Camera Turret

## 2.3 Optional accessories

The Joystick Controller, Riser and a longer Camera Harness (100ft / 30m) can be purchased separately to be incorporated into a new or existing system as per your requirements.



Joystick Controller



Riser

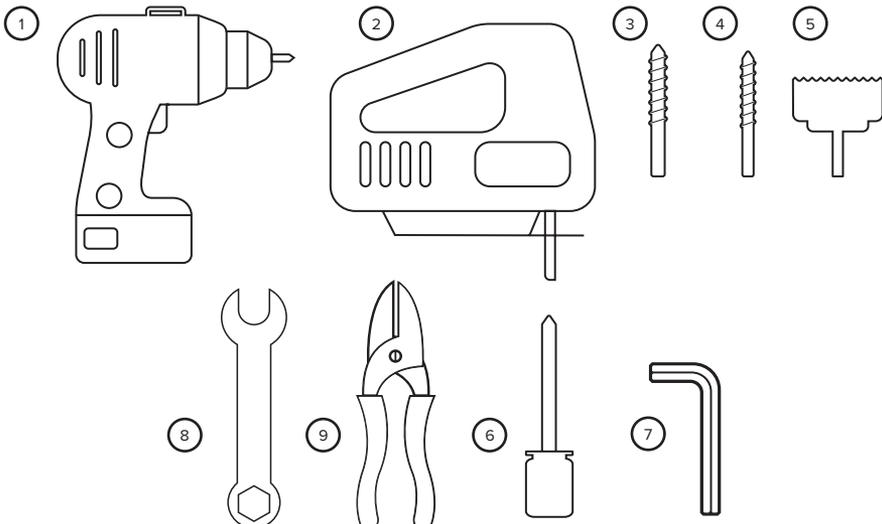


Camera Harness  
(100ft / 30m)

## 2.4 Installation tools requirements

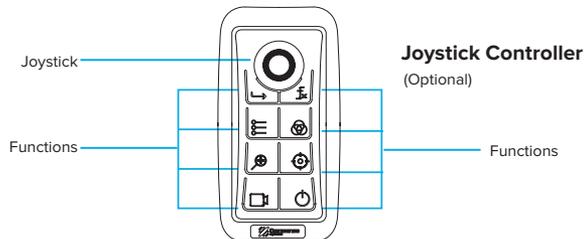
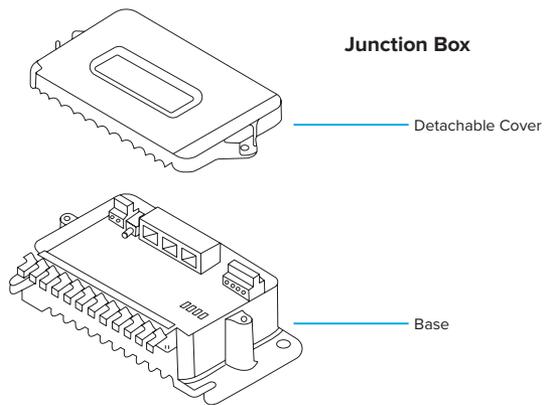
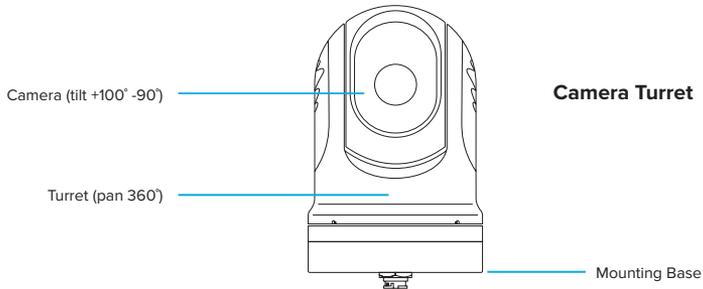
The following are additional tools and items required for installation that are not included in the package.

1. Drill
2. Jig Saw
3. Drill bit - 0.27in (7mm)
4. Drill bit - 0.23in (6mm)
5. Hole Saw - at least 1.57in (40mm)
6. Screwdriver
7. Hex key (Allen key) size 4 (for securing/removing the Junction Box cover)
8. Wrench size 8 (for securing the Controller studs)
9. Cutter (for removing excess ends of the cable ties)



## 2.5 Getting to know the camera

Take a few moments to familiarize yourself with camera controls and displays. You may find it helpful to bookmark this section and refer to it as you read through the rest of the manual.



## 03 - Installation & setup

### 3.1 Installation checklist

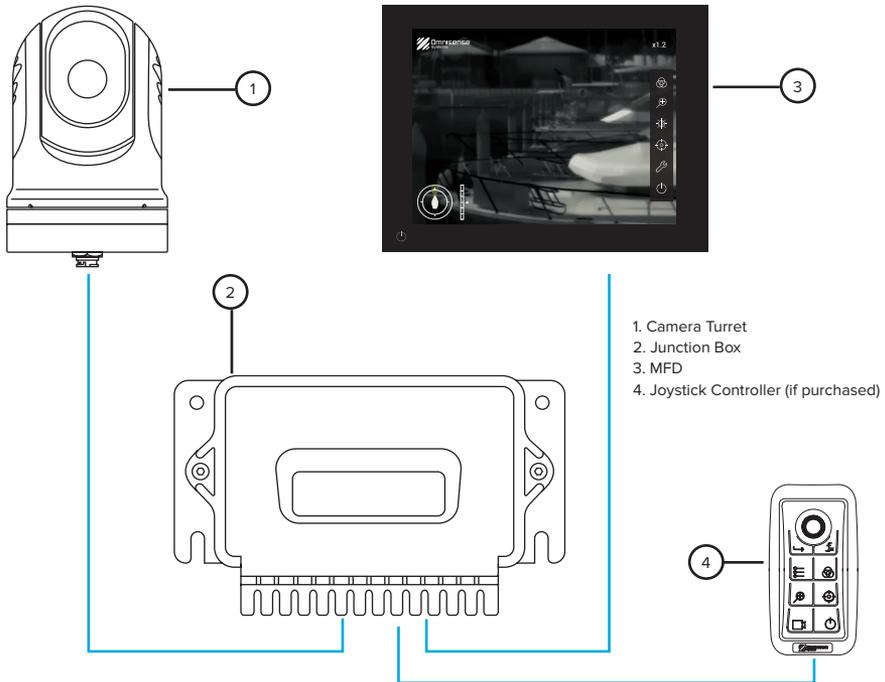
The installation of the system will include the following tasks:

1. Planning your system setup
2. Prepared all required tools and items
3. Site the individual equipment
4. Route the cables
5. Create the opening for the Joystick Controller
6. Drill the mounting and cable holes for Camera Turret
7. Connect the cables to the products
8. Secure all products in place
9. Power on and test the system
10. Perform cable management

### 3.2 Layout & location

Before you commenced the installation, it is important to produce a schematic diagram. The diagram will be handy for any future maintenance or upgrades to the system. The diagram should include the location of all components, cable types, routing and length.

This is the layout plan of how your Ulysses Micro thermal camera system will be set-up.



Identify a suitable location to mount your Camera Turret. Ideally, it should be installed:

- above the bridge of your vessel,
- the mast or
- a location as high as practicable that offer/or close to 360° unobstructed view.

Alternatively, you may decide on a location that can offer the best view that you desire.



Note that the Camera Turret can be mounted ball-up (upright) or ball-down (upside-down) position.

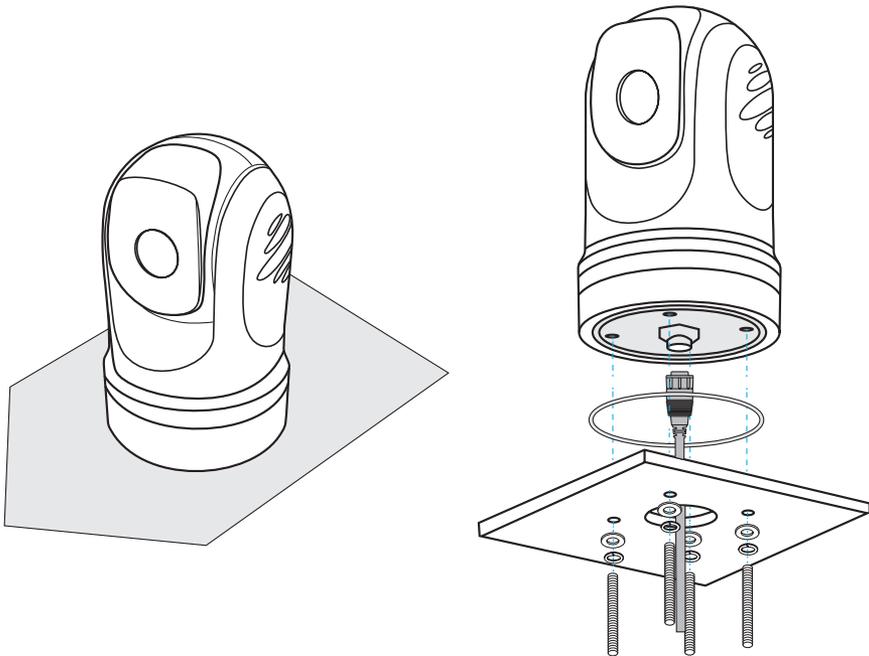
Other points to consider for installation of your products include:

- The mounting surface must be horizontal and flat.
- Choose a location as close to the vessel's centerline as possible. This provides a symmetrical view when looking forward or aft.
- Ensure that the Camera Turret is installed in an accessible location for periodic cleaning (fresh-water rinse), an inspection of mounting point integrity, mechanical soundness and preventive maintenance.
- Camera Turret mounting point should be sturdy and free from excessive vibration.
- The Camera Turret should be mounted as high as practical, but without interfering with any radar, navigational or communications electronics.
- Omnisense Systems products conform to the appropriate Electromagnetic Compatibility (EMC) regulations. To minimize electromagnetic interference between equipment, we recommend that wherever possible, Ulysses Micro equipment and cables connected to it are:
  - at least 3ft (1m) from any equipment transmitting or cables carrying radio signals. e.g. VHF radios, cables and antennas. In the case of SSB radios, the distance should be 7ft (2m).
  - more than 7ft (2m) from the path of a radar beam. A radar beam can be assumed to spread 20° above and below the radiating element.

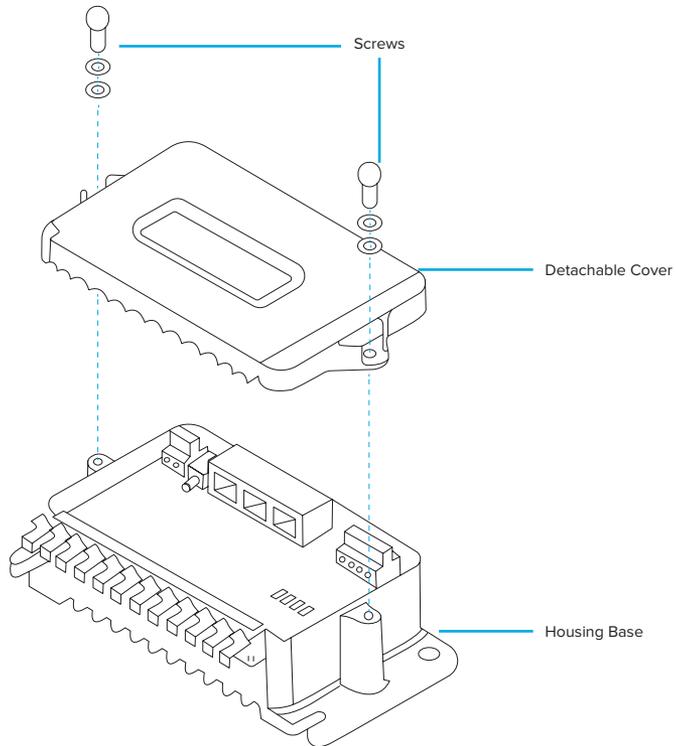
### 3.3 Mounting the Camera Turret

The Camera Turret holds the imaging module, optics and Pan/Tilt platform. The Camera Turret can be configured to be installed ball-up (upright) or ball-down (upside-down) position. Identify and select a position with a clear line of sight to the intended observation area. The mounting area should also be secure and free from excessive vibration.

1. Take note of the orientation of the Camera Turret and place the base forward-facing relative to the bow of your vessel. There is an arrow mark at the base of the Camera Turret indicating the forward-facing of the turret for installation. In most cases, this arrow should point towards the general direction of the bow of the vessel.
2. Using the Mounting Template or Mounting Decal provided, mark and drill the 0.27in (7mm) holes required for attaching the Camera Turret.
3. Place your Camera Turret base over the screw holes and secure your Camera Turret with the four M6 studs, washers, spring washers and nuts provided. Note that the thread holes at the base of the turret have a maximum depth of 0.5in (13mm). We recommend a length of between 0.3-0.4in (8-10mm) with a thread pitch of 1.0. At no time should the studs penetrate more than 0.5in (13mm) from the base.
4. Ensure also that you insert the studs correctly and do not cross-thread. Such damages are not covered under warranty.
5. Take the Camera Harness and run it through the central hole and connect it to the connector at the base of your Camera Turret.



Ensure depth of screws used do not penetrate more than 0.5in (13mm) from the base. Failure to observe this may severely damage the product.



### 3.4 Installing the Junction Box

The Junction Box is the main interface that handles communication between the components. It also distributes the power supply to the Camera Turret and the Joystick Controller.

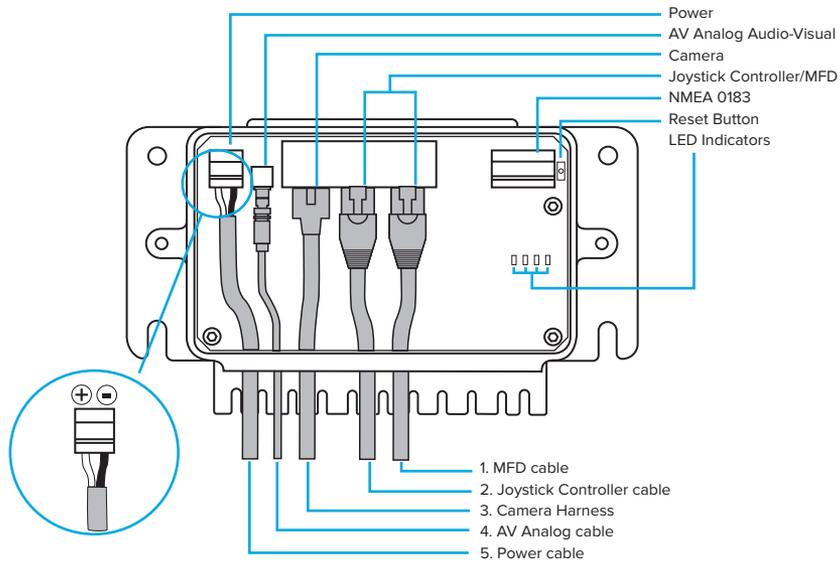
The Junction Box consists of the housing base, a see-through polycarbonate cover and it is secured by two M5 studs on each side of the box. To access the internal sockets, remove the retaining fasteners and the polycarbonate cover.

Create necessary openings for cables on the weather rubber seal found at the cable seat.

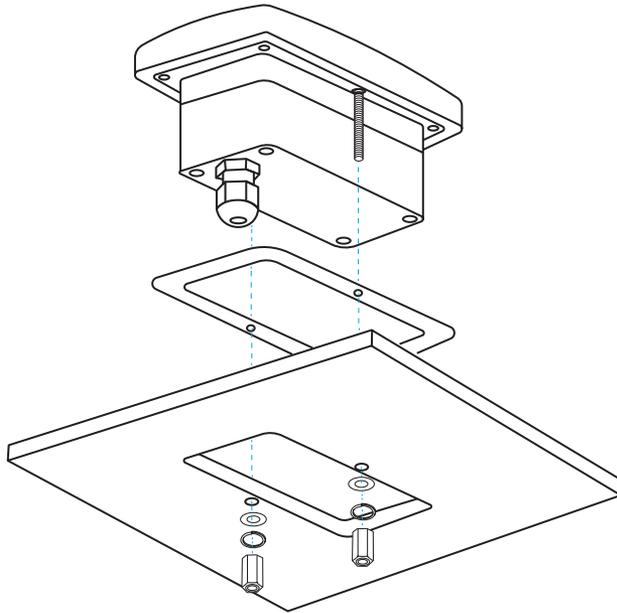
Once cabling connections are completed, replace the polycarbonate Junction Box cover. Cables can be further secured to the cable seat by the cable ties provided.

 Please note that the Junction Box is not weatherproof and should be installed in an area protected from the elements.

 We recommend installing the Junction Box onto a bulkhead with a cable outlet facing down and within practical connecting distance to the display/MFD and Joystick Controller, if used.



1. **MFD cable** - Connect one end of the ethernet cable to your MFD and the other to the ethernet port on the Junction Box marked “Controller/MFD”.
2. **Joystick Controller cable** - Connect one end of the ethernet cable to the controller and the other to the ethernet port on the Junction Box marked “Controller/MFD”.
3. **Camera Harness** – Connect mating end to connector found at the base of the camera and the remaining end of the Camera Harness to the ethernet port in the Junction Box marked “Camera”. To create a proper waterproof connection, ensure connection to the camera base is properly secured and locked.
4. **AV Analog cable** – If you are using an analog monitor, connect one end of the AV Analog cable to the [AV] port in the Junction Box and the other end to an analog monitor.
5. **Power cable** - Connect the power cable provided to the [Power] ports in the Junction Box and the DC power source on your vessel. It is recommended that you use either a 12V or 24V DC power. The power cable consists of one inner black and white wire. Please ensure that the correct polarity is inserted into the right terminal.  
Black for (-) negative, White for (+) positive
6. **NMEA 0183 socket** - Your Ulysses Micro system may have functions that require input from NMEA 0183 devices. To utilize those functions, connect your NMEA 0183 data source to the [NMEA] socket in the Junction Box using 24-20 AWG cables. Connect the NMEA data output from the NMEA device to the Rx pins in the Junction Box.
7. **Reset Button** - Press the reset button for 10 sec to reset the Junction Box to it’s the default IP. To re-connect the Junction Box to the system, you will need to set the camera’s IP back to the default IP. The equipment should be connected thereafter.
8. **LED Indicators** - The LED indicators provide you with a visual indication of the functioning of the equipment connected to the Junction Box. Please refer to the Troubleshooting guide in Chapter 8 for explanations on the LED indicators.



### 3.5 The Joystick Controller (if purchased)

The Joystick Controller is the physical controller for the camera system. The Joystick Controller is meant to be panel mounted. If correctly installed, the top side of the Joystick Controller is waterproof and suitable for open deck installation.

Identify and select an installation position that provides the best ergonomics for controller operation. The housing of the Joystick Controller is designed to provide a stable grip while thumb and index fingers move the knob.

1. The Joystick Controller has a flush back that can be easily fitted onto any flat surface. Select a suitable location close to your MFD/Monitor.
2. Using the Joystick Controller Mounting Template provided, mark and cut out the space to mount the Joystick Controller.
3. Drill the 6mm holes required for attaching the Joystick Controller.
4. Mount the Joystick Controller and use the bolts provided to secure it in place.
5. Connect one end of the Joystick Controller Cable to the [Controller] port in the Junction Box and the other end to the Joystick Controller.
6. To pair your Joystick Controller with the Camera Turret, see section 5.5.7.

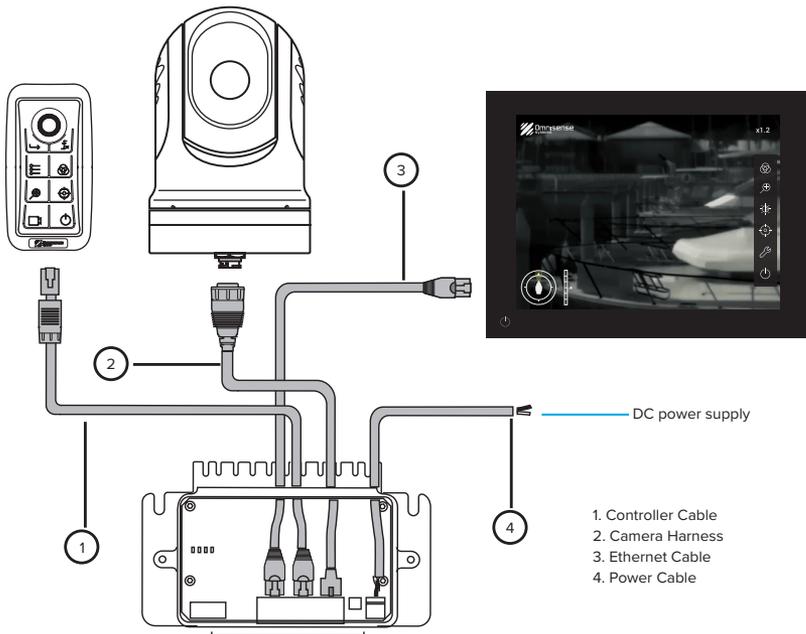
### 3.6 Connecting to your display options

You can choose to display the video output of your Ulysses Micro system to:

1. a supported MFD (refer to the latest list on the support page of our website)
2. an analog monitor
3. computer (via web browser)

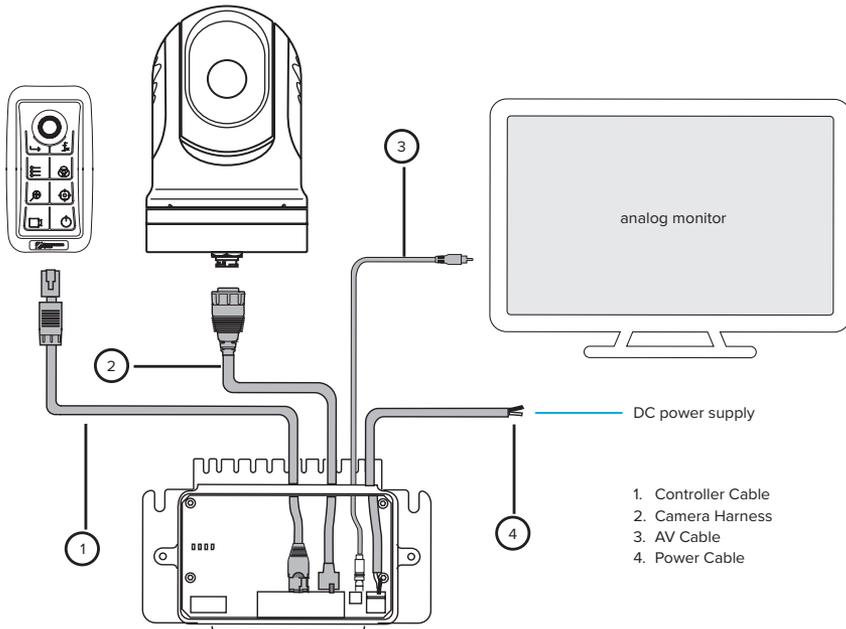
#### 3.6.1 Connecting to your MFD

1. Connect the ethernet cable from the [Controller/MFD] port in the Junction Box to your MFD. Omnisense Systems camera system currently functions with Furuno, Garmin and Navico's MFD. You can check the latest supported brands and models on our website.
2. The camera will work with Garmin MFD with OneHelm. If you are using a Garmin's MFD, you should see a Ulysses Micro icon displayed on the 'OneHelm' page after powering up both the MFD and camera system. Launch the Ulysses Micro icon to use the camera.
3. If you are using a Furuno or Navico's MFD, you will need to configure the camera system to communicate in the correct network environment by using a web browser or an analog monitor/Joystick Controller. Refer to section 3.6.4 to change your IP settings.
4. Connect to a web browser (see section 3.6.3). Alternatively, you can access the UI using an analog monitor (see section 3.6.2) and the Joystick Controller.
5. Select  and then 
6. Select Device Access (see section 5.5.2).
7. Select on [Furuno] or [Navico] to generate a new set of IP address.
8. Select Save and Reboot.
9. Your MFD will be paired to the camera system after the reboot.



### 3.6.2 Connecting to an analog monitor

1. Connect the AV analog cable from the [AV] port in the Junction Box to your analog monitor.
2. The display will appear on the screen. Use the Joystick Controller to control the camera.
3. For this setup option, you will require to purchase the Joystick Controller to operate the system.



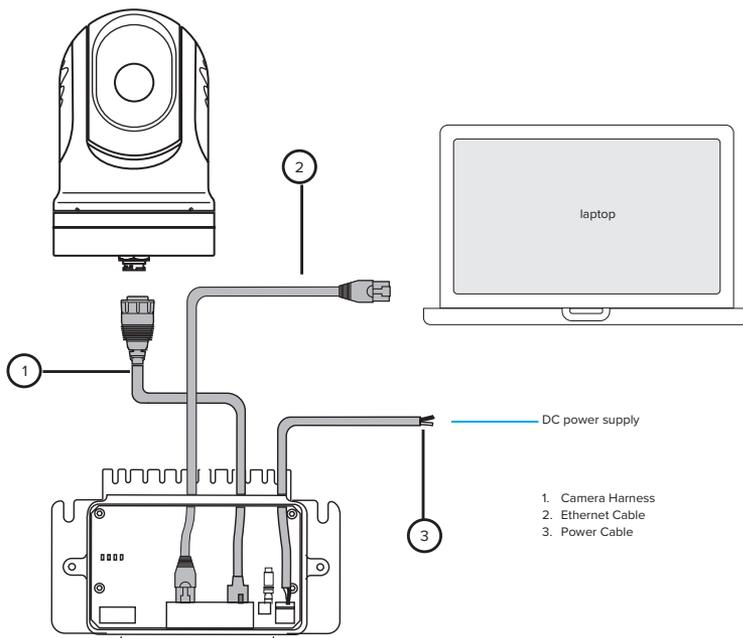
### 3.6.3 Connecting to a laptop/desktop

1. Connect an ethernet cable (not provided) from the [Controller/MFD] in the Junction Box to your computer.
2. On your web browser, enter the default IP address (<http://172.16.6.225>) indicated at the base of the Camera Turret or current IP address (if changed from default) and use the following login credentials to set up the camera.

Username: admin

Password: 12345

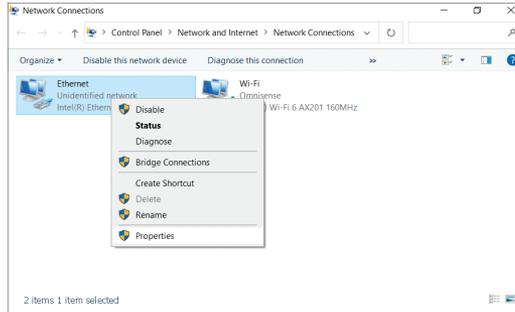
3. Once you logged in to the User Interface (UI) on your web browser, you can control and access the camera settings by using the mouse on your laptop/desktop.



### 3.6.4 Change IP Settings

If you are unable to connect to the camera due to the a different set of IP address, follow this step to configure the camera for Windows user.

1. Go to Settings, then click on Network & Internet.
2. Right-click on your Ethernet Network that is connected to the Junction Box and click on Properties.



3. On the properties screen, select **Internet Protocol Version 4 (TCP/IPv4)** and click on Properties (Fig 1).

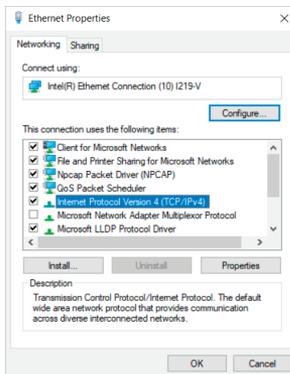


Fig.1



Fig. 2

4. On IPv4 properties screen, select **Use the following IP Address** option (Fig. 2).
5. Enter the following IP address: 172.16.6.xxx (any number). As you can see in the above image (Fig. 2), the first 3 number sets (172.16.6) in IP Address field need to be the same as the Junction Box IP address. You can only change the last number set with any number from 1 to 254. Click in the Subnet Mask area, which should auto-complete. Click OK.
6. Launch your web browser and enter the following address <http://172.16.6.225/> and login with the following credentials:

Username: admin  
Password: 12345

Full control of the camera can be accessed through the Web Interface. You can configure the IP address to connect to your MFD from the Settings menu.

### **3.7 Cable management**

Cable routing must be conducted correctly to maximize the performance and shelf life of the cables. Do not bend the cable excessively. Please ensure that a minimum bend radius of 3in (150mm) is achieved.

Protect all cables from physical damages by using trunking or conduit where possible. Do not run cables through bilges, doorways, hatches and hot objects.

Always route data cables as far away from other equipment and cables, high current carrying AC/DC power lines and antennas.

## 04 - Operations

### 4.1 Powering-up

The Ulysses Micro system automatically powers up when it is connected to your vessel's power.

1. Ensure that you have connected the Camera Harness to the Camera Turret.
2. Ensure that your video output is connected and your display is powered on.
3. The Camera Turret will park the sensor lens down into park position when in Standby mode.
4. When your Camera Turret is mounted in the ball-up (upright) position, the sensor lens will face down. When your Turret is mounted in the ball-down (upside down) position, the sensor lens will face up.

### 4.2 Login to camera

Upon powering up, the login page will be displayed as shown below. Enter the password to access the user interface. The default password is "12345".



**Username**

**Password**

**LOGIN**

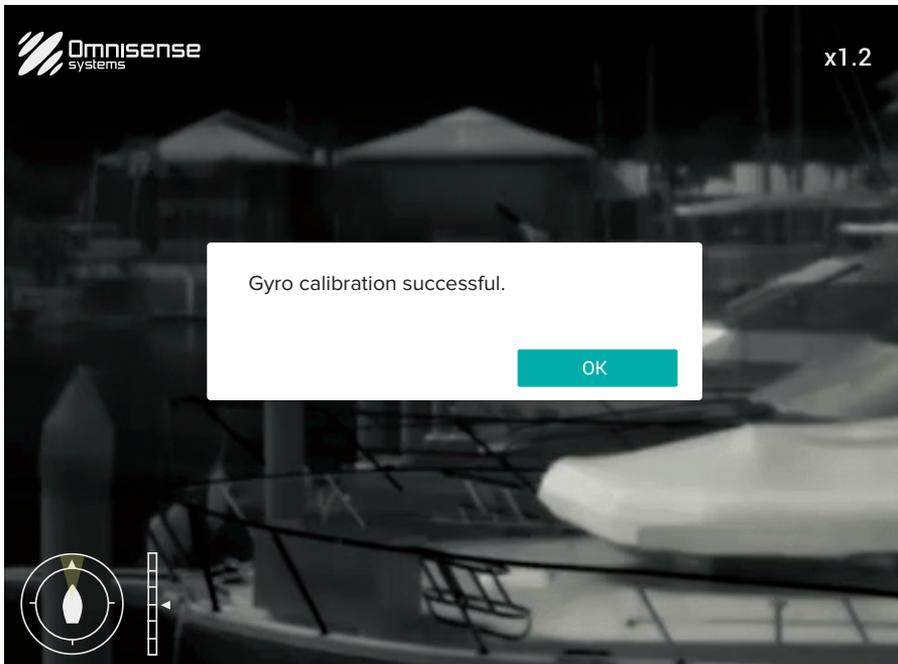
### 4.3 Gyro calibration (Ulysses Micro S and S+ only)

Upon powering up/waking up from Standby mode, the system will initiate a gyro calibration sequence. A “gyro calibrating” message will be displayed on the screen when calibration is performed.

- If gyro-calibration is successful, a “Gyro calibration successful” message will be displayed. Select [OK] on the dialog box to confirm.
- If gyro-calibration is unsuccessful, a “Gyro calibration unsuccessful” message will be displayed. To perform gyro calibration again, select [Calibrate] on the dialog box. Alternatively, you may select [Cancel] to exit the dialog box.

When the system detects that a gyro-calibration is required, a “gyro cal required” message will be displayed on the screen.

- To perform gyro calibration, select [Start] on the dialog box.
- Alternatively, you may select [Ignore] to exit the dialog box.



#### 4.4 Thermal display image

Upon successful login, a thermal display image will appear on the screen. The camera outputs an IP-video feed that can be displayed on a compatible Multi-function display (MFD), an analog monitor, or a desktop/laptop via a web browser.



 Take some time to familiarize yourself with the thermal image on your display. This would allow you to utilize the system effectively.

Points to take note about viewing thermal images:

1. Consider every object you view in terms of how it will look “thermally” as opposed to how it looks to your eye. For example, look for changes caused by the heating effect of the sun. These are particularly evident right after sunset.
2. Experiment by looking for hot objects (such as people) compared to the colder surroundings.
3. Experiment with the camera for daytime viewing. The camera can provide improved daytime viewing in environments where traditional video camera performance suffers, such as in shadows or backlit scenes.

The thermal display image includes icons to indicate the current status of the camera.

## 4.5 Operating the camera

The camera functions can be accessed directly from your Multi-function Display (MFD) or web browser.

### If you are using a MFD

Tap anywhere on the screen to display the Quick Menu and the Virtual Joystick.

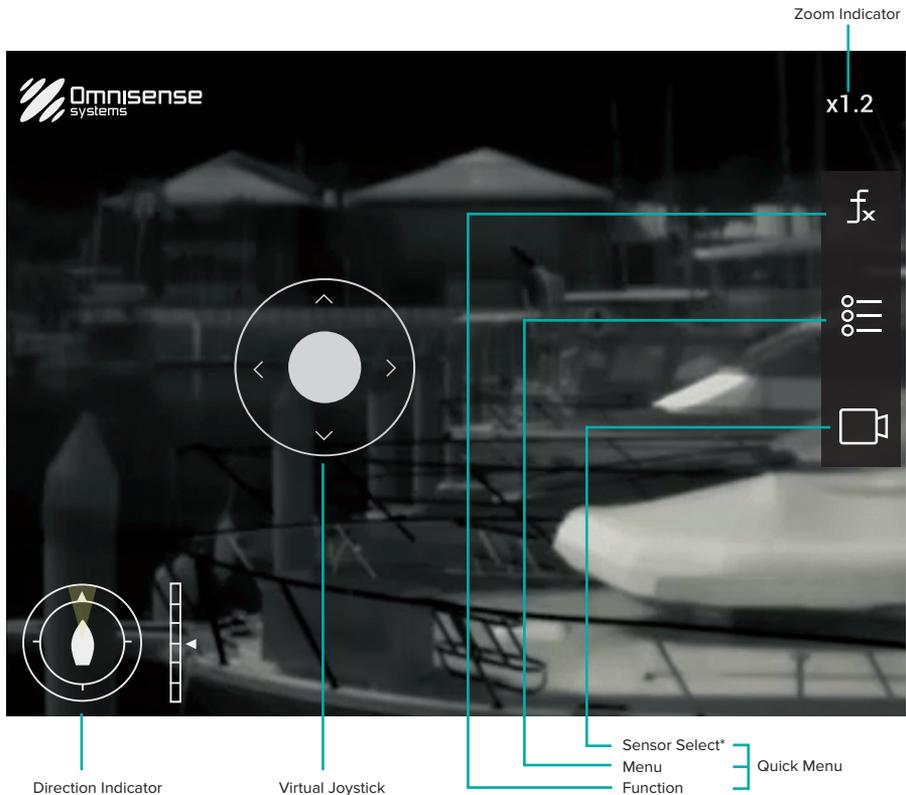
### If you are using a web browser

Use your mouse to click anywhere on the screen to display the Quick Menu and the Virtual Joystick.

### If you are using an analog monitor

Install the Joystick Controller to access the camera (see section 5.5.7)

The Quick Menu and the Virtual Joystick will disappear after 3 seconds of inactivity.



\*Sensor Select function is not available for Ulysses Micro

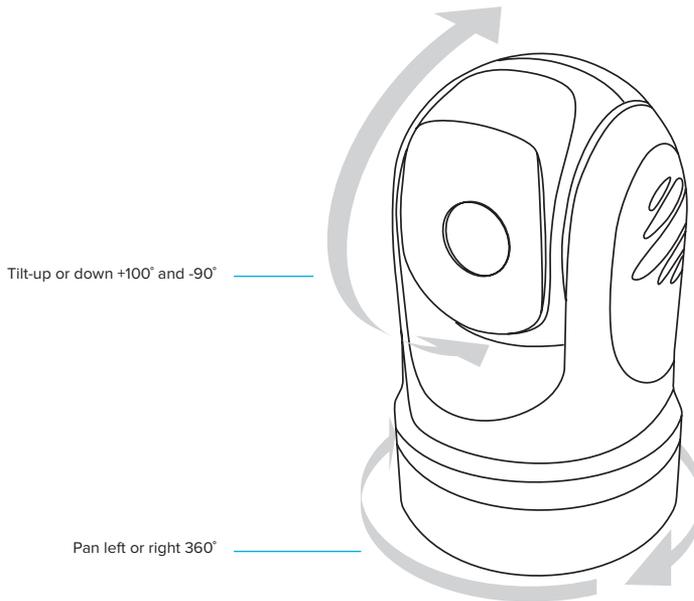
The thermal display image comprises of the following icons:

Icon	Description
	<p><b>Direction Indicator</b> The triangle segment inside the circle indicates which direction the camera is pointing with respect to the vessel. The scale and marker on the right indicate the camera's tilt angle.</p>
<p>x1.2</p>	<p><b>Zoom Indicator</b> Displayed whenever the thermal image is magnified from 1.0 to 4.0X.</p>
	<p><b>Virtual Joystick</b> To direct or point the camera to the intended direction and/or object, Select and drag the middle button on the Virtual Joystick towards the intended direction.</p>
	<p><b>Function</b> Quick access function that can be programmed for Home, NUC, Standby and Radar. The default function is set to NUC (see section 5.3.1 to understand what is NUC). See section 5.5.6 to learn how to program the shortcut key.</p>
	<p><b>Menu</b> Menu access to the camera system functions and settings.</p>
	<p><b>Sensor Select</b> Toggle between thermal and day cameras. This feature is not available in the Ulysses Micro system.</p>

## 4.6 Camera control

The Virtual Joystick and/or the knob on the Joystick Controller (if purchased) controls all panning and tilting operations of your Turret and Camera.

Use the Virtual Joystick or Joystick Controller to pan (turn left or right) and tilt (up or down) the camera to search and acquire a visual on your target.



## 05 - Menu

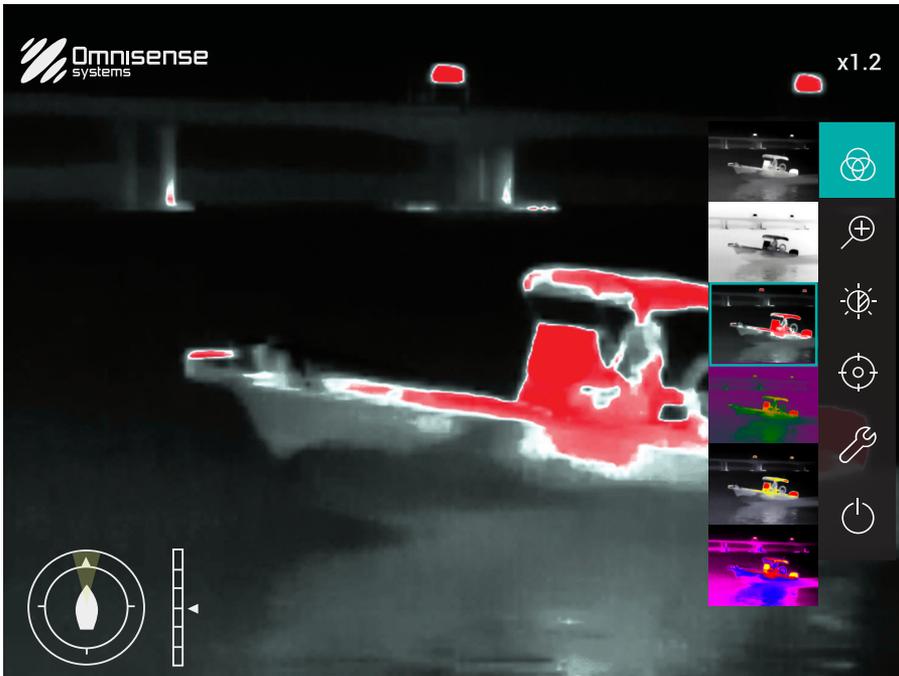
Select  to access the functions and settings of the camera. The list of menu icons will appear on the right of the screen. Select a menu icon on the display or Joystick Controller to access the respective function listed on the table below.



	<b>Color Palette</b>	Select from 6 different color palettes See section 5.1 for more details
	<b>Zoom</b>	Zoom level from 1.0 to 4.0X See section 5.2 for more details
	<b>Brightness &amp; Contrast</b>	Adjust image brightness and contrast See section 5.3 for more details
	<b>Radar Track / Stabilization</b>	Radar Tracking or Slew-to-Cue Stabilization and Heading Lock for Micro S and Micro S+ See section 5.4 for more details
	<b>Settings</b>	Access to camera's settings See section 5.5 for more details
	<b>Home / Standby</b>	Camera position, Standby and Wake up See section 5.6 for more details

## 5.1 Color Palette

Select  to access the Color Palette. Select your preferred color scheme from the 6 different color modes available. Tap or click anywhere on the screen to exit the menu. If using the Joystick Controller, select by moving the knob up or down.



Color	Feature
White Hot	Light colors for hotter objects/regions Default mode for the IR display
Black Hot	Inverted version of White Hot Dark colors for hotter objects/regions
Highlight	Selected color gradient for greater contrast between regions
Night Running	For better viewing comfort during low light conditions
Flame	For greater contrast across a narrow range of temperature
Psychedelic	Rich saturated colors with glaring contrast

## 5.2 Zoom

The Ulysses Micro features a fix-focus imaging sensor with the ability to zoom into target objects up to 4.0X magnification.

- Select  to activate the zoom slider.
- Move the slider to the left or right to control the amount of magnification.
- Tap or click anywhere on the screen to exit the menu.



Zoom slider

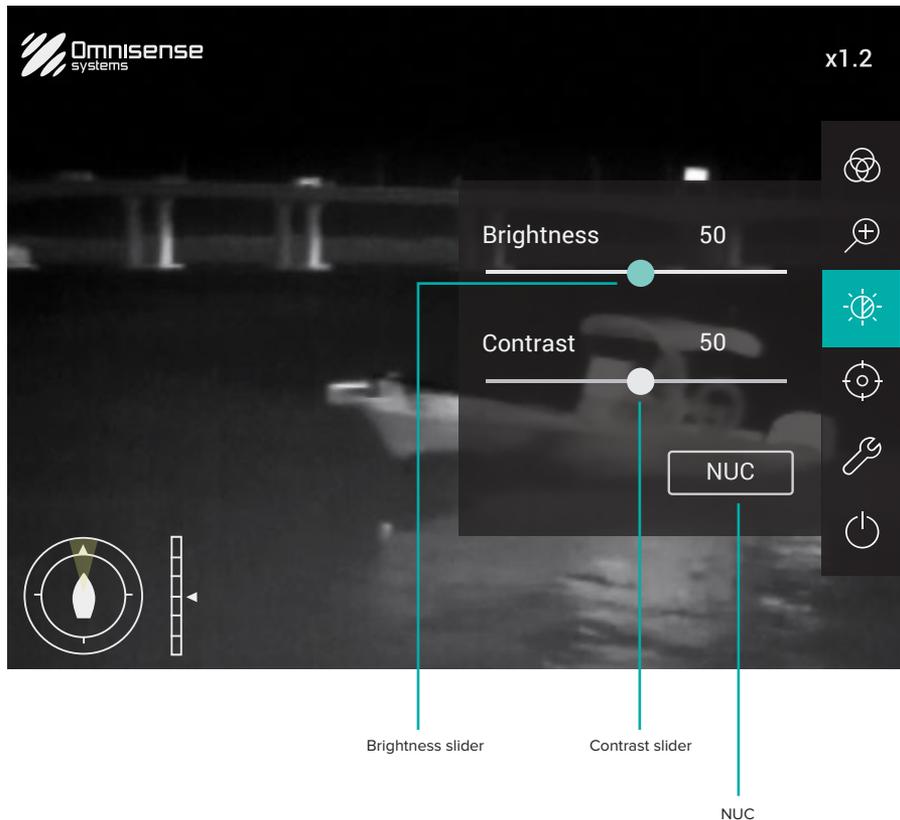
## 5.3 Brightness & Contrast

1. Select  to activate the function.
2. Move the Brightness slider to the left or right to control the amount of brightness.
3. Move the Contrast slider to the left or right to control the amount of image contrast.
4. Select anywhere on the screen or press  on the Joystick Controller to exit menu.

### 5.3.1 NUC

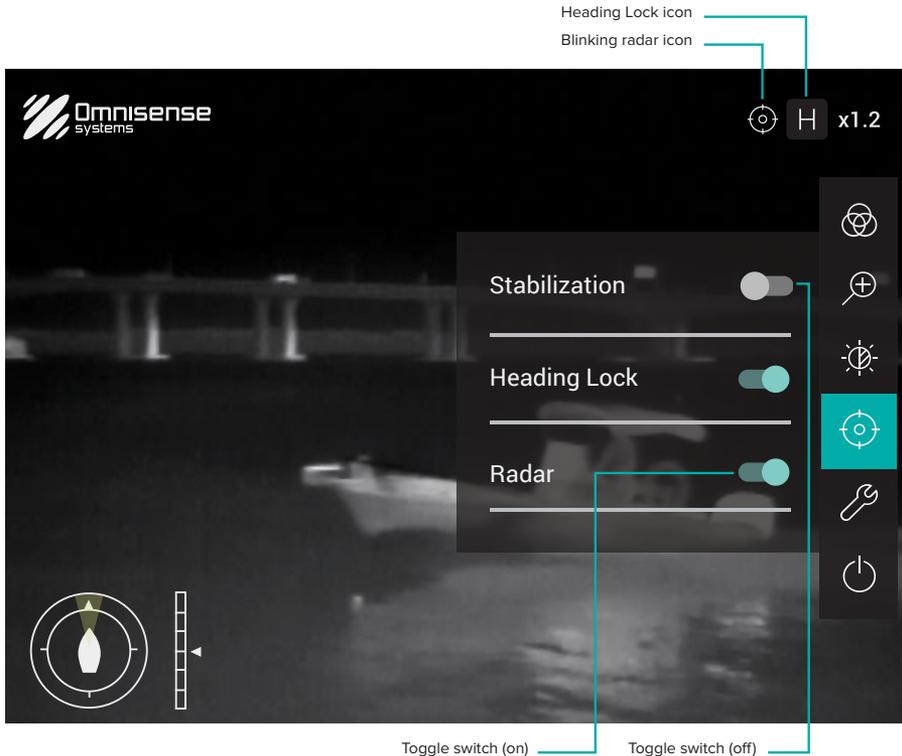
Non-Uniformity Correction (NUC) function corrects for slight detector drift that occurs due to changes in the surrounding temperature and environment. As the heat emitting from the camera can interfere with its performance, the NUC function allows the camera to adjust the image based on its own IR radiation readings.

The Non-Uniformity Correction (NUC) function is activated by default during the initial startup and remains active in real-time for maintaining image quality. Should the image quality appear unsatisfactory, you can activate the NUC function manually by pressing the [NUC] button. Alternatively, you can also manually use the NUC function before capturing a critical image to ensure accuracy.



## 5.4 Radar Track

Select  to access Radar Track settings. Both [Stabilization] and [Heading Lock] modes are designed to maintain stability and quality of the image when encountering excessive movement.



### 5.4.1. Stabilization (Ulysses Micro S and S+ only)

Stabilization mode provides dual axis stabilization that enhances overall image stability. When activated, the camera will remain pointed in the same direction irrespective of any directional changes to the vessel. The inbuilt gyro-stabilization technology counteracts excessive ship motion caused by wave actions or vessel movement, ensuring the image quality remains crisp and clear.

To activate Stabilization mode, slide  to the right. An  icon will appear at the top right corner screen, indicating that Stabilization mode is now active.

### 5.4.2. Heading Lock (Ulysses Micro S and S+ only)

Heading Lock mode provides tilt (up and down) stabilization for enhancing image stability as the vessel moves and turns. Unlike full stabilization mode, the camera is not locked onto a fixed point.

To activate Heading Lock mode, slide  to the right. An  icon will appear at the top right corner of the screen, indicating that Heading Lock mode is now active.

### 5.4.3 Radar Tracking (Slew-to-Cue)

When interfaced with a compatible radar, the Ulysses Micro system Slew-to-Cue function allows your camera to slew to the target you selected on the radar.

To activate Radar Tracking mode, slide  to the right. A blinking  icon will appear at the top right corner of the screen.

To deactivate radar tracking, slide  to the left. The toggle switch will be turned to .

To visually acquire the target with the Radar Track function:

- Select target from the radar on your Multi-function Display (MFD).
- The camera will slew to the selected direction and the target will be shown on the display if the target is within the performance range of the camera.

 The Stabilization & Heading Lock modes are only applicable on the Ulysses Micro S and Ulysses Micro S+ version.

 Only one stabilization mode can be activated at any given time.

 When the Radar Track function is activated while the camera is on Stabilization mode, the camera will automatically switch to the Heading Lock mode.

 Radar Tracking function only applicable to Multi-function Display (MFD) with NMEA0183 RSD.

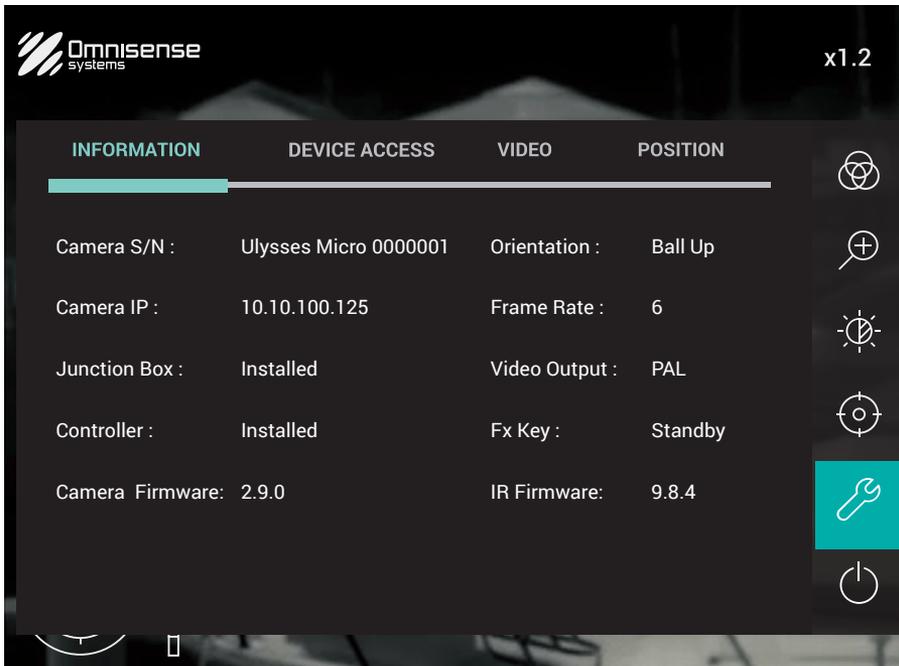
## 5.5 Settings

Select  to enter the Settings menu. The camera settings can be configured from this section and comprise of the following sections:

1. Information
2. Device Access
3. Video
4. Position
5. Function
6. LED
7. Controller
8. Junction Box
9. NMEA

### 5.5.1 Information

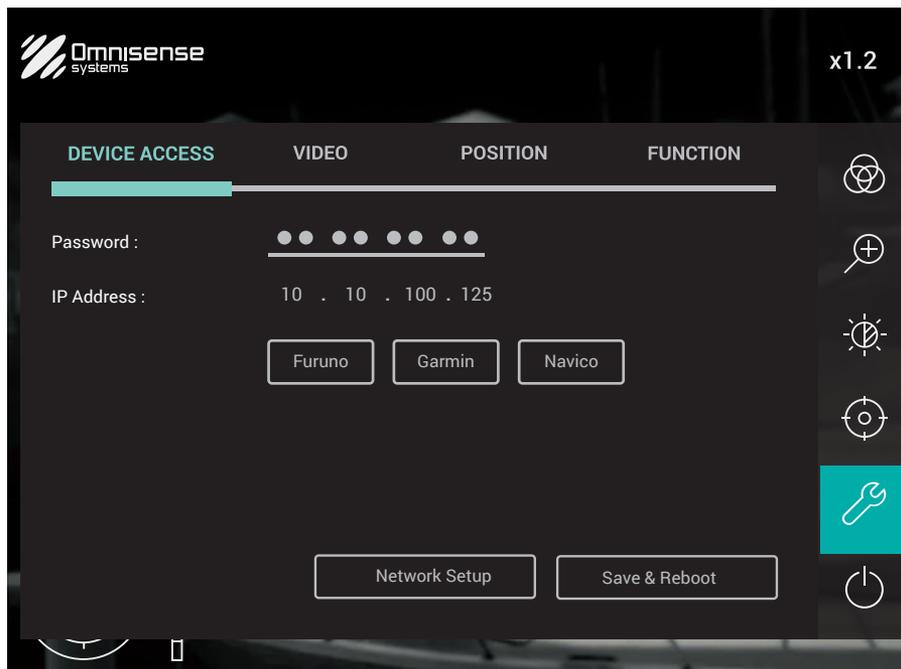
The Information section provides an overview of the camera system configuration.



This is only an example, the values shown on your system will vary.

## 5.5.2 Device Access

In this section, you can change the default password and IP address for the camera system.



### How to change the password

1. Select on the password field (default password is 12345).
2. Enter your preferred password and click/tap anywhere on the screen.
3. Select [OK] on the dialog box to save your new password.

### How to change the IP address

The IP address is set to pair with a Garmin's MFD by default. If you are using Furuno or Navico's MFD, you can set the IP address automatically to pair with one of the supported brands using the preset button.

To change the IP address for either Furuno, Garmin or Navico's MFDs:

1. Select on either [Furuno], [Garmin] or [Navico] button to generate a set of IP address.
2. Select [Save & Reboot]. Select [OK] on the dialog box to confirm.
3. The camera will be paired with your MFD after the reboot.

### Changing the IP address manually

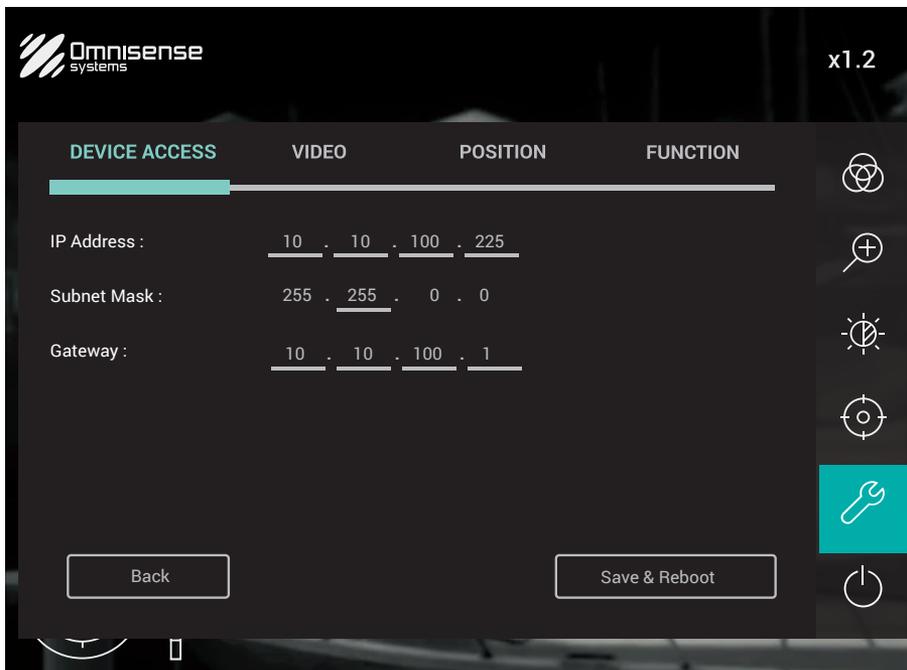
If there is a conflicting IP address with other connected devices within the network, you can change the camera's IP address manually (see Network Setup 5.5.3).

### 5.5.3 Network Setup

In this section, you can manually configure the IP address, subnet mask and gateway for your camera unit. Change the settings accordingly if they cause IP address conflict with other devices in your network.

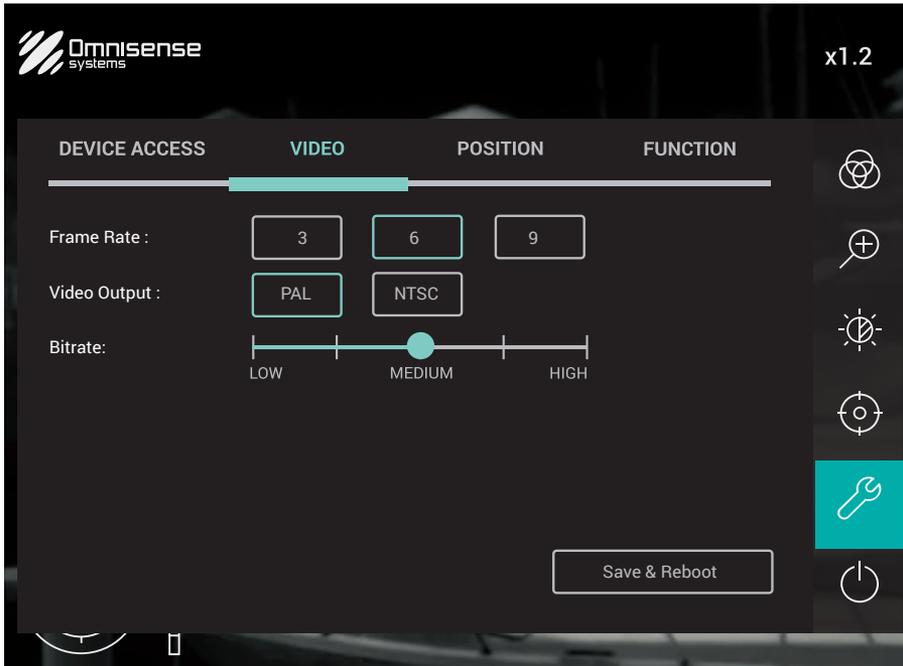
To change the IP address settings:

1. Select on the IP field (IP Address, Subnet Mask or Gateway) that you wish to change.
2. Enter the preferred IP address.
3. Select [Save & Reboot]. Select [OK] on the dialog box to confirm.
4. The new settings will be registered after the reboot.



## 5.5.4 Video

In the Video section, you can change the Frame Rate (fps) and/or the Video Output Format.



### Frame Rate

There are three different video frame rates options: 3, 6 or 9. Selecting on any of the option will activate it immediately.

### Video Output Format

You can choose either PAL or NTSC for the format of video output. To select your option:

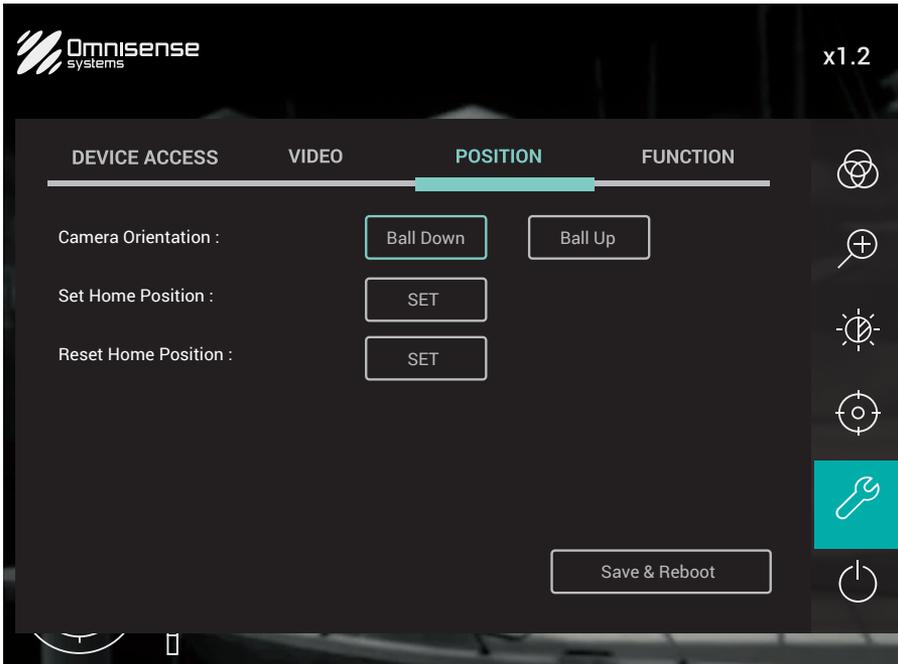
1. Select [PAL] or [NTSC].
2. Select [Save & Reboot]. Select [OK] on the dialog box to confirm.
3. After the reboot, the video output will be displayed with the new format.

### Bitrate

If you're having trouble with video quality, adjust the bitrate using the slider. Drag the slider to experiment and pick the most optimal bitrate that yields an acceptable image quality.

## 5.5.5 Position

In this section, you can change the Camera Orientation and set the Home Position.



### Camera Orientation

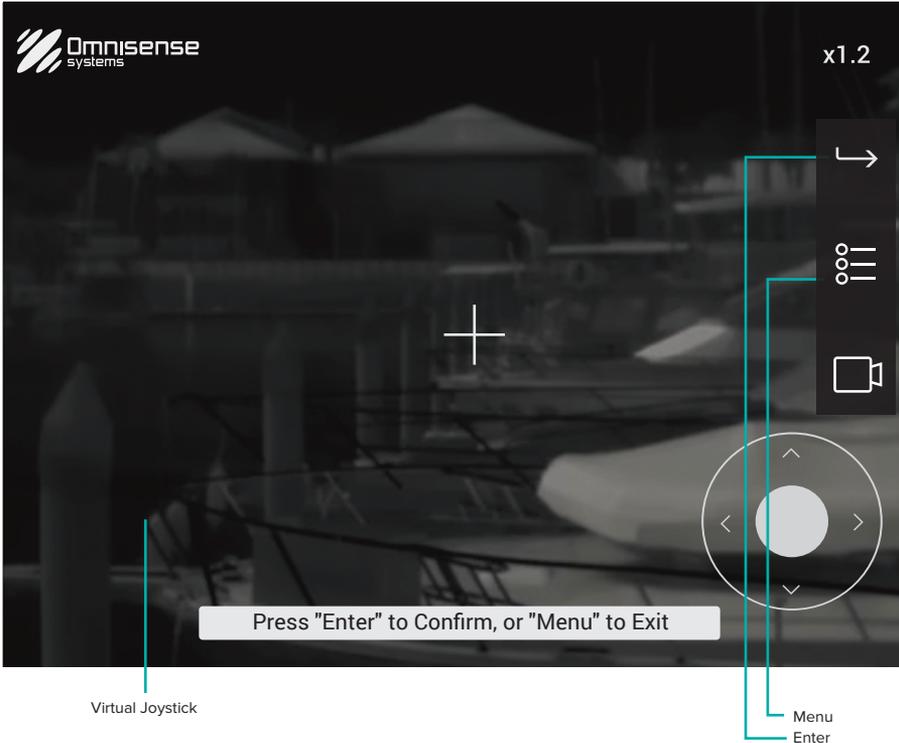
Depending on how you have mounted your camera, you will need to select either [Ball up] with the Camera unit mounted “upright” or [Ball down] with the Camera unit “upside-down”.

1. Select on the appropriate orientation [Ball Up] or [Ball Down].
2. Select [Save & Reboot]. Select [OK] on the dialog box to confirm.
3. The camera orientation will be registered and ready to be used.

## Set Home Position

The system has a function that allows you to preset your preferred offset pan and tilt position of the camera when the [Home] option is activated. To utilize this function:

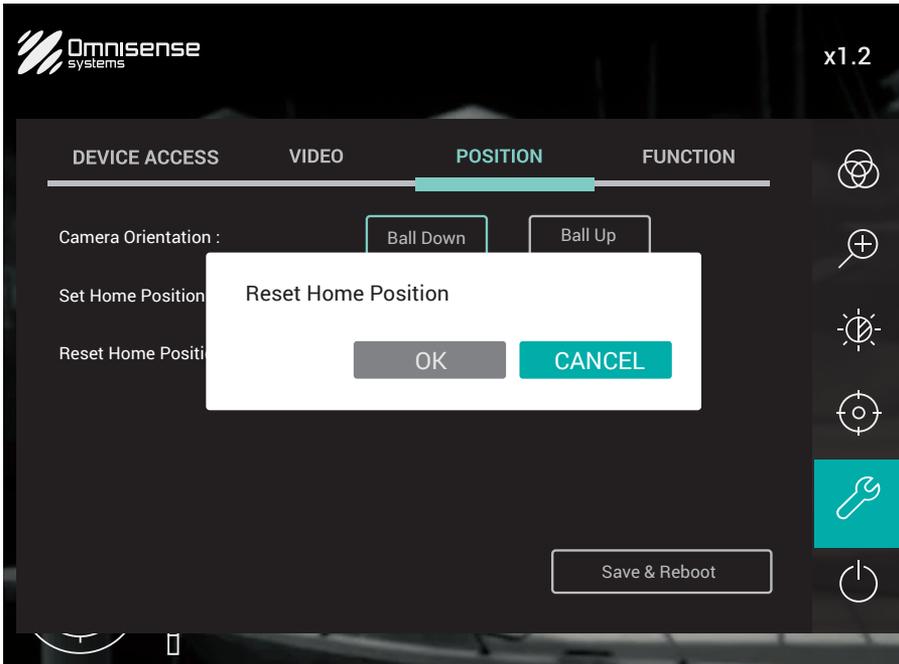
1. At the Set Home Position field, select [Set].
2. Pan and tilt the camera to your preferred "Home" position.
3. Select ↩ to save the position or select ☰ to exit.



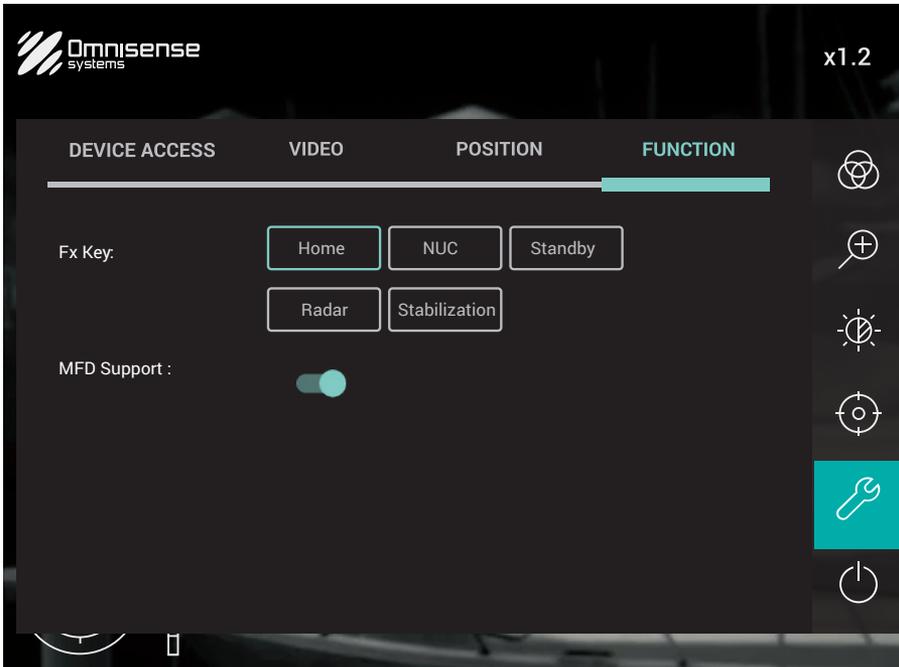
### Reset Home Position

The [Reset Home Position] function resets the offset “Home” position back to the original factory settings. To reset the “Home” position to factory default:

1. At the Reset Home Position field, select [Set] once.
2. Select [OK] on the dialog box to confirm.
3. The original position is set to factory default.



## 5.5.6 Function



### Fx Key

This function allows you to program a shortcut key to the  $f_x$  button. Select from one of the available functions: Home, NUC, Standby or Radar to activate. The Stabilization function are only applicable on the Ulysses Micro S and Ulysses Micro S+ version.

### MFD Support

The system is compatible with Furuno, Garmin or Navico's MFD. The [MFD Support] is switched on by default. When you switched on the MFD and Ulysses Micro system, the MFD will automatically detect the camera and display the Ulysses Micro icon on the screen. You can launch the Ulysses Micro user interface (UI) by tapping/clicking on the icon.

 Do not turn off this function unless it's necessary, such as when you have multiple MFDs connected within the network.

To turn off/on the function:

1. Slide  to the right to turn on or slide  to the left to turn off.
2. Select [Save and Reboot] on the dialog box to confirm.
3. The new setting will take effect after the reboot.



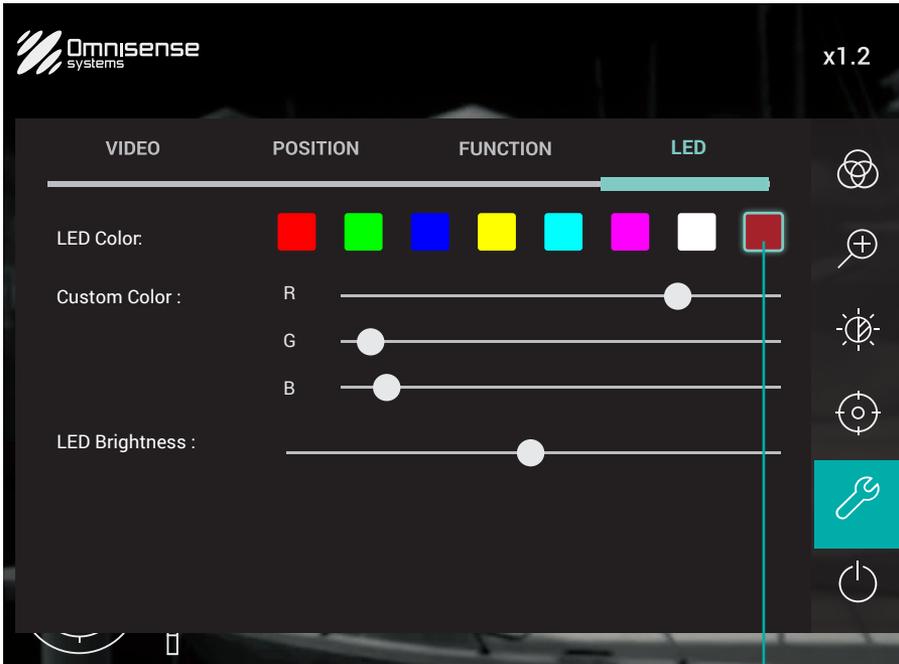
Once the [MFD Support] function is switched off, the MFD will not be able to detect the camera or launch the app. To turn it switched back on, you will need to connect the camera to a computer/laptop and access this function [MFD Support] via a web browser.

## LED

The camera is pre-installed with variable color LED lightings. Select the preferred color from the seven color preset.

For customization of the lighting's color, select the last color icon and adjust the slider for [Red], [Green] and [Blue] accordingly.

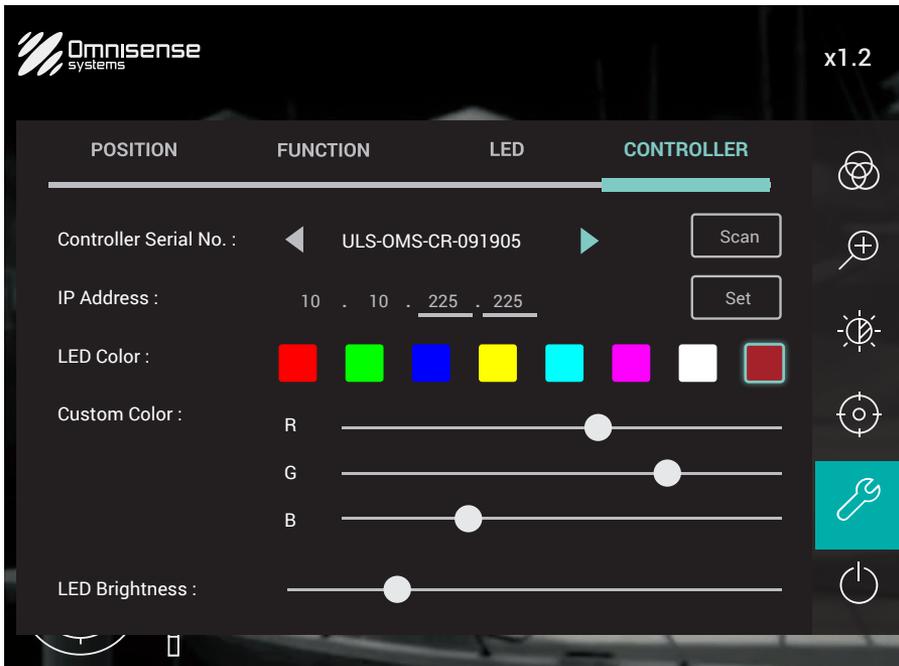
To change the brightness of the LED, simply shift the slider for [LED Brightness].



Select the last icon for color customization

## 5.5.7 Controller

In this section, you can connect to the Joystick Controller(s), set the IP address and adjust the background lightings of the Joystick Controller(s).



### Connecting to the Joystick Controller

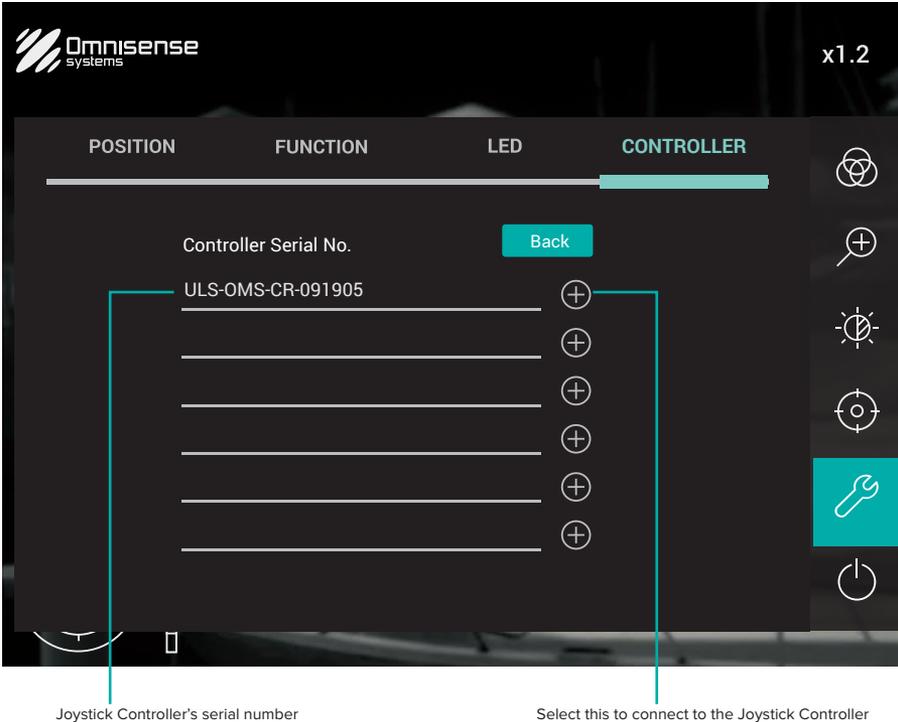
To connect your Joystick Controller, select [Scan]. The system will automatically scan for a Joystick Controller that is connected to the system.

Once the Joystick Controller is found, the serial number will be displayed. Select ⊕ to connect the Joystick Controller and it will be ready for use.

If the system is unable to locate the Joystick Controller, perform a factory reset to the Joystick Controller by pressing and holding the ↵ and ⏻ buttons simultaneously for 10 sec. Upon completing the reset, the serial number should appear. Select ⊕ again to connect the Joystick Controller.

 Note that to find out the details of other Joystick Controller, select ◀▶ in the [Controller Serial Number] field to access the various connected Joystick Controller.

See the next page for section image.



Joystick Controller's serial number

Select this to connect to the Joystick Controller

### Connecting additional Joystick Controller(s)

The system is designed to connect to additional Joystick Controller(s). To connect additional Joystick Controller(s) to the camera system network, simply repeat the steps mentioned above.

### Changing the Joystick Controller's IP address

If the Joystick Controller's IP address is causing conflict with other equipment in the network, you can change the IP address manually. To change the IP address:

1. Select on the IP address field and enter the desired IP address
2. Select [Set] to apply the new IP address.

### Adjusting the background lighting of the Joystick Controller

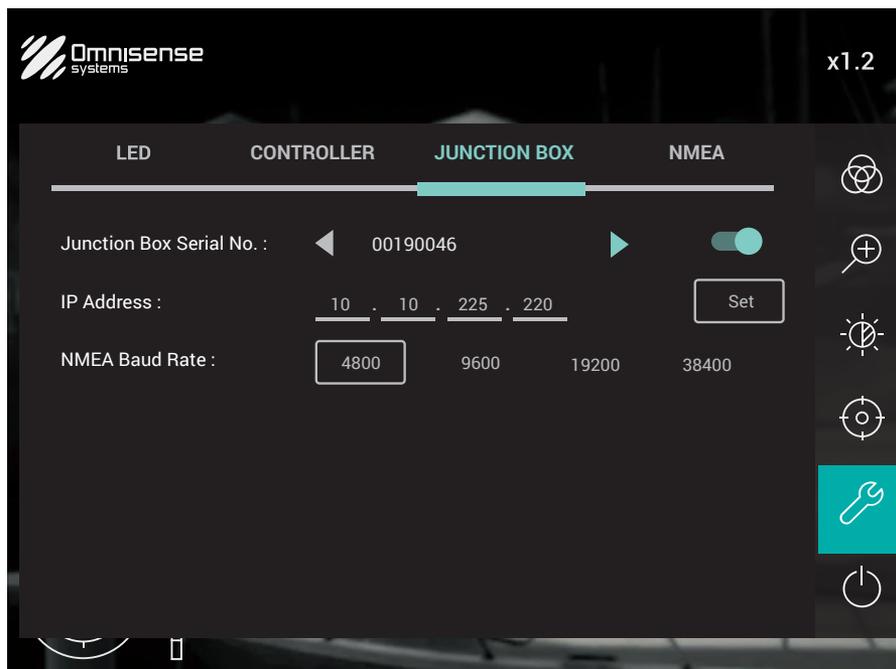
The camera is pre-installed with variable color LED lightings. Select your preferred color from the seven colors preset.

For customization of the lighting's color, select the last color icon and adjust the slider for [Red], [Green] and [Blue] accordingly.

To change the brightness of the LED, simply shift the slider for [LED Brightness].

### 5.5.8 Junction Box

In this section, you can view the Junction Box serial number and IP address. You can change the Junction Box's IP address and set the NMEA baud rate.



#### Junction Box Serial No

You can view the serial number and the IP address of the Junction Box. To access other Junction Boxes that may have been connected to the system, use the ◀▶ arrow to scroll through other Junction Box (if connected).

The  enabled/disabled the camera to acquire the radar track coordinates on the selected Junction Box.

#### IP Address

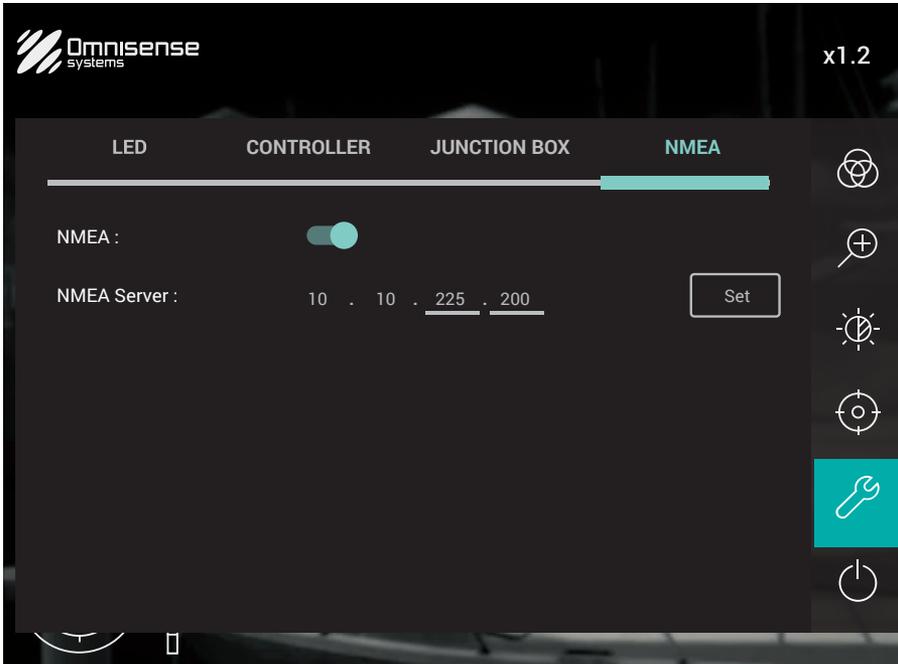
The current IP Address is displayed here. If you need to change the IP address of the Junction Box to prevent IP conflict within the network, enter a new set of IP address and click [Set].

#### NMEA Baud Rate

You can set the NMEA baud rate to either 4800, 9600, 19200 or 38400 to complement your existing electronic navigational equipment such as your radar, GPS and/or AIS.

## 5.5.9 NMEA

This function allows the camera system to be connected to the NMEA equipment through NMEA 0183 (Ethernet connection). This allows you to activate the Slew-to-Cue capability of the camera system. To activate the function, slide  to the right.



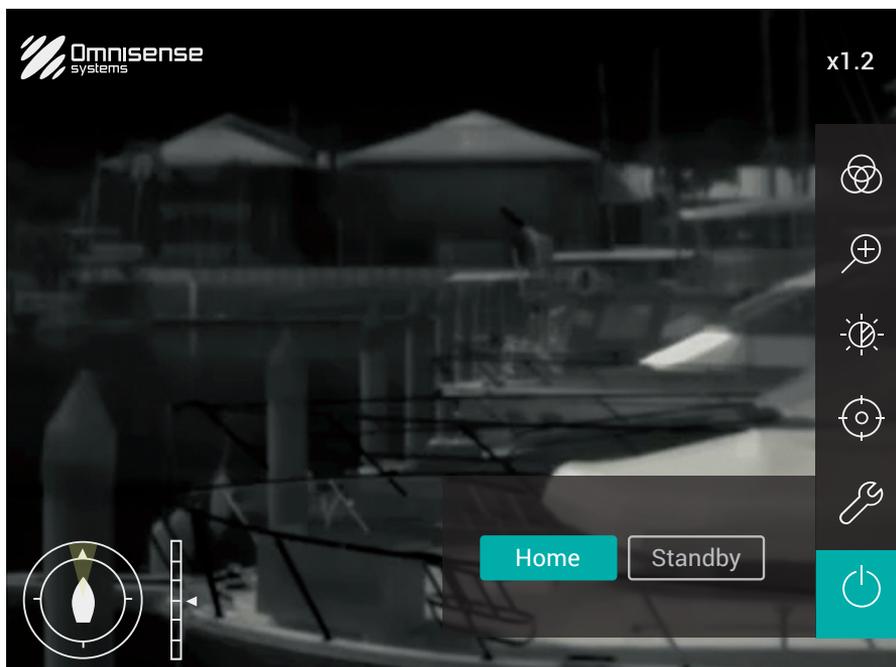
### NMEA Server

If the IP address of the NMEA server conflict with other equipment connected to the network, you can change the IP address of the server. Enter a new set of IP address and click [Set].

## 5.6 Home/Standby

The [Home/Standby] function allows you to wake, park, or return the turret to home position.

- Select [Home] will set the turret back to the preset home position.
- Select [Standby] will park the turret. The lens will be stored either to face down (ball-up) or face up (ball-down).



### Home

To return turret to home position, select [Home]. To reset or set a new home position (see section 5.5.5).

### Standby

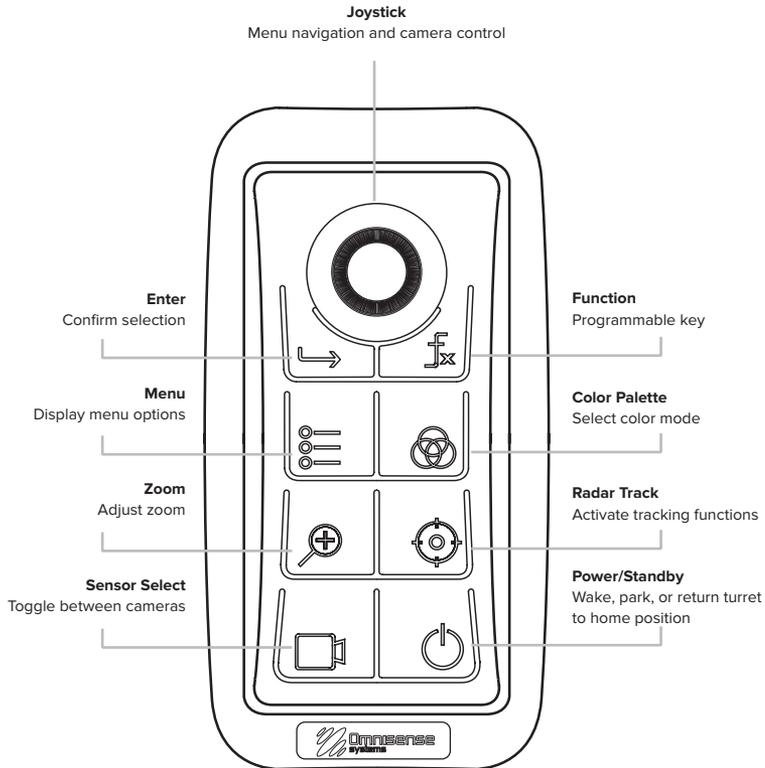
To set turret in park position, select [Standby]. The camera lens will be stored faced down (ball-up) or faced up (ball-down). The text on the [Standby] button will change to [Wake Up].

To wake turret from park position, press [Wake Up] button or long press the  button on the Joystick Controller.

## 06 - Joystick Controller

Display controls are provided by the 8 buttons on the Joystick Controller and the Virtual Controller on the web browser.

Press the button once to access the menu items. Use the joystick to select and cycle-through the options available.



### Joystick Controller icon description

Below is the description of each icon for further understanding.

	Joystick	Move the joystick to pan and tilt the camera Navigate through the menu items Adjust Zoom/Focus, Brightness & Contrast
	Enter	Press to confirm a selection
	Menu	Press to display the options available See chapter 5 for more details
	Zoom/Focus	From 1.0X to 4.0X Use the joystick to control the amount of zoom See section 5.2 for more details
	Sensor Select	Toggle between thermal and day cameras Not available for Ulysses Micro
	Home/Standby	See section 5.6 for more details
	Track	Radar Tracking or Slew-to-Cue See section 5.4 for more details
	Color Palette	Select from 5 different color palettes See section 5.1 for more details
	Function	Programmable shortcut key See section 5.5.6 for more details

## 07 - Maintenance

### 7.1 Caring for the camera

#### **Cleaning:**

After each trip out at sea, gently flush the Turret with fresh water to prevent the accumulation of minerals from salt water and sea spray.

The sensor lens has a protective coating that may be easily damaged. Do not use paper or any dry fabric to wipe the lens. Use a soft cloth instead and a small amount of mild soap if you need to remove any stains on the lens. Do not apply pressure, as this could result in damage.

#### **Important:**

Disassembly of the cover and/or camera can cause permanent damage and will void the warranty.

#### **Ensuring the integrity of the installation:**

Perform routine inspection of the camera, controller and its mounting surface to ensure that it is installed securely. When the system is powered off, grasp the camera and controller firmly at the base to confirm that it is secured soundly.

#### **Do not leave the lens pointed at the sun:**

Do not leave or park the lens pointed at the sun or other strong light sources for an extended period. Intense light may cause the image sensor to deteriorate or produce a white blur effect in images.

### 7.2 Storage

When the camera will not be used for an extended period, uninstall and store it covered in a cool, dry and well-ventilated area.

Do not store your camera with naphtha or camphor mothballs or in locations that are:

- poorly ventilated or subject to humidity of over 60%
- next to equipment that produces strong electromagnetic fields, such as televisions or radios
- exposed to temperatures above 85°C or below -40°C

### 7.3 Service and maintenance

This product contains no user-serviceable components. With the exception of regular cleaning, please refer all maintenance and repair to Omnisense Systems. Unauthorized repair will void the manufacturer's warranty.

## 08 - Troubleshooting

If the camera fails to function as expected, check the list of common problems below before consulting your retailer or Omnisense Systems representative.

Problem/Error Indications	Possible causes	Possible solution
Junction Box - Power LED not lighted	No power to the Junction Box	Check that the power is switched on Check that the power cable at the junction box is secured properly.
Junction Box -POE A LED not lit	Joystick Controller cable loose	Check that the Joystick Controller cable is connected fully at the Joystick Controller and [Controller] port in the Junction Box.
Junction Box -POE B LED not lit		If the Joystick Controller is connected to this switch, refer to solution for Junction Box - POE A LED not lit  <b>Note:</b> This is normal if the MFD is connected to this POE switch.
Junction Box -POE C LED not lit	Camera Harness loose	Check that the Camera Harness is connected correctly at the turret and the other end is fully connected at the [Camera] port in the Junction Box
Junction Box -Alarm LED blinked	One of the equipment connected to the Junction Box is drawing excessive power (more than 28W)	The system will cut off all power to the equipment connected to it and automatically reset.  <b>Note:</b> Only products from the camera system are certified to be connected and drawing power through the Junction Box.
No images on the display	Loose cable connections between junction box and MFD/ Analog display wrong IP input if connecting via web browser	Check that the cables between the Junction Box and your MFD/ Analog display are properly connected and that your MFD/Monitor has been powered on.  Re-input the IP address provided into your computer.
Image too dark	Insufficient contrast or brightness	To adjust the brightness of the image, select  to adjust the brightness and/or contrast or select  and change to another color palette.
Image flickering	Loose connections	Check that the cables are connected properly and secured into the respective ports.
Jerky images	IP address settings	If you are connected to a laptop, check if the IP address conflicts with your existing IP settings.
GUI unresponsive		see Jerky Images.
Unable to use the Slew-to-Cue Function	Improper connection	Check the NMEA 0183 connections, make sure that the cables have been secured into place and that the polarity for both TX and RX is connected correctly.

Cannot pan/tilt	Dirt build-up	Check the space between the turret and the mounting base for any build-up of deposits. Gently flush the turret and the mounting base with fresh water to dislodge the accumulation of minerals from salt water and sea spray.
No response from the Joystick Controller	Improper connection	Check that the cables are connected properly and secured into the respective ports.  Check the Joystick Controller's IP exists inside the settings page.
If the camera stops responding	Possible strong external static charge conflicting IP with other equipment onboard	Switch off the power to the camera. Once the camera is off, wait a few seconds and then turn the camera back on.  If the problem persists, conduct Factory Reset Plug in the power supply to the Junction Box for 15 sec, then remove the power supply from the Junction Box for 5 secs. Perform this action for a total of 4 times.  On the 5th time, keep the system power up and you should be able to operate the camera system.  <b>Note:</b> The camera turret IP will be reset to the factory default IP. You may change the IP from the settings page.
Joystick Controller not responding to other troubleshooting actions	Conflicting IP with other equipment onboard	Press and hold the ←→ and ⏻ buttons simultaneously for 10 sec.  The Joystick Controller's IP will be reset to the default. To re-connect the Joystick Controller to the system, you will need to set the camera's IP back to the default IP. The equipment should be connected thereafter.
Junction Box	Conflicting IP with other equipment onboard	Press the button - SW10 RST (just beside the NMEA junction connector) for 10 sec.  The Junction Box's IP will be reset to the default IP. To re-connect the Junction Box to the system, you will need to set the camera's IP back to the default IP. The equipment should be connected thereafter.
Forget login password		Conduct Factory Reset (See "If the camera stops responding")

## 09 - Specifications

<b>General</b>	<b>Micro</b>	<b>Micro S</b>	<b>Micro S+</b>
Thermal Resolution	384 X 288	384 X 288	640 X 480
Field of View	29° (H) X 22° (V)	24° (H) X 18° (V)	24° (H) X 18° (V)
Stabilization	N	Y	Y
Focal Length	13mm		
Sensor Type	17um Uncooled Microbolometer LWIR FPA		
Zoom	Continuous E-Zoom 1.0X - 4.0X		
<b>System Specifications</b>			
Pan / Tilt Coverage	Pan: Continuous 360° Tilt: 100° / -90°		
Video Output	Composite Analog Video Output (SD) NTSC or PAL IP video		
Video Frame Rate	9Hz		
Power Requirements	25.5W (max), 9 to 32V DC		
Encapsulation	IP 66		
NMEA 0183	Yes		
<b>Environmental</b>			
Operating Temperature Range	-4°F to 140°F / -20°C to 60°C		
Storage Temperature Range	-40°F to 185°F / -40°C to 85°C		
EMI	IEC 60945		
Salt Mist	IEC 60945		
Vibration	IEC60945		
Wind	115mph / 100kn		
<b>Range Performance</b>			
Detect Man (6ft X 1.5ft / 1.8m X 0.5m)	Up to 0.43mi / 688m		
Small Vessel (13ft X 5ft / 4m X 1.5m)	Up to 3mi / 1.5km		
<b>Dimensions</b>			
Size	5.5in X 8.7in / 140mm X 220mm		
Weight	≤ 5.5lb / 2.5kg		
<b>Part No.</b>			
	ULS-M384U	ULS-M384S	ULS-M640S
<b>Optional Accessories</b>			
	Joystick Controller Camera Harness (100ft / 30m) Riser		

**Note:**

1. Due to our policy of continual improvement, specifications may change without prior notice.
2. System must not be used in replacement of human observation.





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