IDU User Manual

Revision v9 - 02.03.23

Software version v148 and onward

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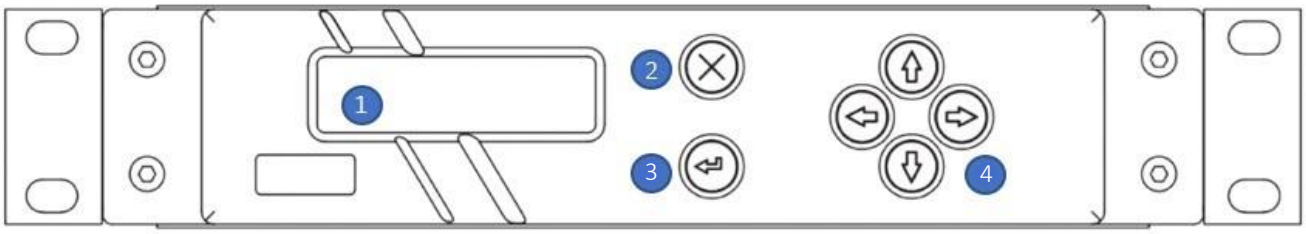
Camera Control Indoor Unit

Introduction

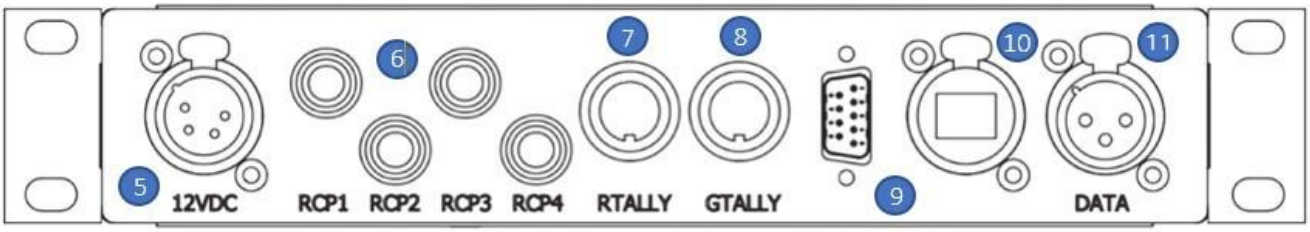
The VideoSys camera control system allows the user to replace the cables between the Remote-Control Panels, Camera Control Units and Cameras. The VideoSys IDU connects directly to existing control panels and in combination with other components from the VideoSys camera control range provides a robust broadcast quality solution.
The VideoSys camera control solution consists of three distinct components; an 'IDU' (Indoor Unit), 'ODU' (Outdoor Unit) and an 'RX' (Receiver). Multiples of these components can be used to best fit the operator's requirements, for example multiple IDU's can be connected to allow for many camera control paths over one ODU. Multiple ODU's can be used to increase RF coverage, and each camera to be controlled requires an RX. From this point on to avoid ambiguity and keep things concise, the terms IDU, ODU, RCP and RX will be used.

We hope that you will find the necessary information within this manual and our specific quick setup guides, if however, you require additional support please don't hesitate to contact your local distributor.

FRONT PANEL



REAR PANEL



1 OLED Display
2 Cancel Button
3 Enter Button
4 Navigation
5 Power Input Connector (4 Pin XLR, Male)
6 Legacy Camera Connectors ('Generic' or 'Sony')
7 Red Tally Input Connector (8 pin DIN)
8 Green Tally Input Connector (8 pin DIN)
9 Bi-directional Data Return Connector (D9)
10 Ethernet Connector (RJ45)
11 Data Output Connector (3 Pin XLR, Female)

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Principal of Operation

The VideoSys camera control system can be configured to operate using one of two fundamentally different architectures, descriptions of the architectures and their relative advantages and drawbacks are as follows:

Uni-directional

In this mode the IDU acts as a 'Virtual Camera' and talks to the RCP via its native protocol. Changes to this Virtual Camera are then encoded into our low latency protocol.
Encoded data is routed from the IDU to the ODU where it is transmitted. Data is then received via the RX. Within the RX a 'Virtual Panel' is updated with the received information, the 'Virtual Panel' then communicates with the camera using its native protocol.

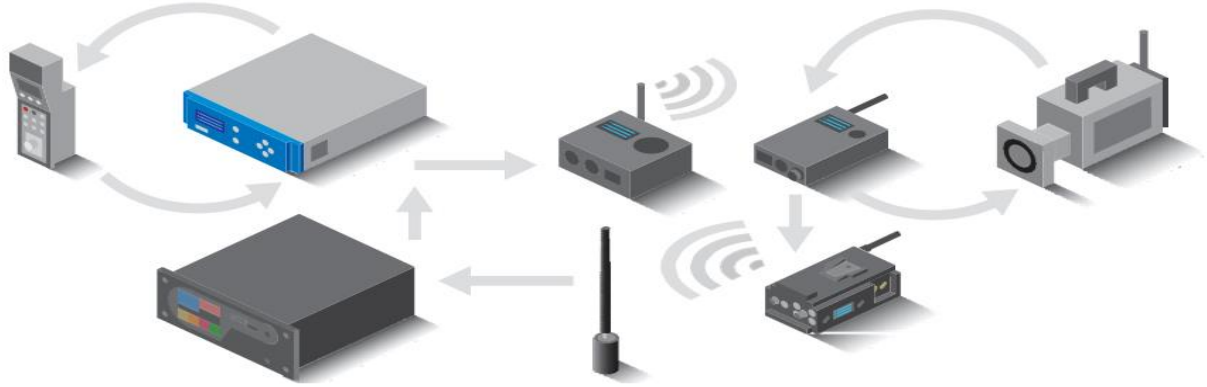
- This approach allows high performance in an extremely poor RF environment as data loss will not cause link failure.
- Uni-directional operation boasts simple setup, as only one data path needs to be configured.
- Due to the use of an intermediate protocol, Uni-directional operation allows operators to mix and match different manufacturers cameras and control panels.
- As each command has to be specifically implemented and handled, not all of the features available on manufacturers cameras and control panels will be available when used with a Uni-directional control link.

Fig 1. A simple Uni-directional camera control setup

Bi-directional

In this mode an RCP natively communicates to the IDU. Data is then conditioned and forwarded on to the ODU, where it is then transmitted. An RX then receives transmitted data and communicates with the manufacturer's camera. Return data is fed from the RX via a return path back to the IDU. The return path is typically provided via the data path on many COFDM video transmitters.

- All of the features that would be available via a cabled setup are available via our Bi-directional setup.
- Due to the bandwidth restrictions of the RF path, RCP wake-up times might be slightly longer than in a wired or Uni-directional set up.
- Due to the reliance on two communication paths, wireless control is not as robust as with Uni-directional operation.



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Connecting Components

The first step is to connect the components of your camera control system.

RCP

This can be connected via an Ethernet network using the RJ45 connector, or via the appropriate cable to the numbered legacy connectors on the back of the unit. A range of pre- made cables and cable wiring diagrams are available on our website or via contacting your local sales representative.

ODU

There are two options for connecting to an ODU, either via the Data Out Connector or using the RJ45 and via an Ethernet Network.

Tally

The IDU can be connected into an existing tally system via the Tally Input Connector, this will respond to contact closure, open collector input and TTL logic levels (inverted).

Power

Connect 12V DC to the Power input XLR connector. When powered the unit will display a boot screen and then present the user with a status screen.

Connector Wiring Diagrams

The following diagrams are from the point of view of the rear panel of the IDU facing the user.

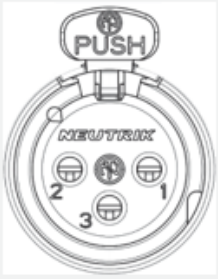
Data Out

3-Pin XLR, Female

NEUTRIK NC3FD-LX -HD

Pin 1: Ground

In RS232 Mode:	In RS484 Mode:
Pin 2: RS232 Tx	Pin 2: RS485 Data –
Pin 3: RS232 Rx	Pin 3: RS485 Data +



Generic Connector *(RCP legacy connector)*

10-pin, Female

HIROSE HR10A-10R-10S(71)

Pin 1: RS422 TX+	Pin 6: Power
Pin 2: RS422 TX–	Pin 7: Ground
Pin 3: RS422 RX+	Pin 8: NC
Pin 4: RS422 RX–	Pin 9: Power
Pin 5: Ground	Pin 10: Ground

Power Input Connector

4-Pin XLR, Male

NEUTRIK NC4MD

Pin 1: Ground	Pin 3: NC
Pin 2: NC	Pin 4: Power

Sony Connector *(RCP legacy connector)*

8-Pin, Female

HIROSE MXR-8RA-8S(71)

Pin 1: RS422 TX+	Pin 5: Ground
Pin 2: RS422 TX-	Pin 6: Power
Pin 3: RS422 RX+	Pin 7: Ground
Pin 4: RS422 RX–	Pin 8: NC

Tally Input Connector

8-Pin DIN, Female

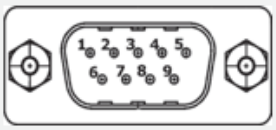
LUMBERG KFV 80

Pin 1: Ground	Pin 5: Input 3
Pin 2: Ground	Pin 6: Ground
Pin 3: Ground	Pin 7: Input 1
Pin 4: Input 2	Pin 8: Input 4

Bi-directional Data Return Port

D-sub 9 pin, Male *AMPHENOL G17S0910110EU*

Pin 1: RS232 Rx (CH1)	Pin 8: Ground
Pin 2: RS232 Rx (CH2)	Pin 9: NC
Pin 3: RS232 Rx (CH3)	
Pin 4: RS232 Rx (CH4)	
Pin 5: Ground	
Pin 6: Ground	
Pin 7: Ground	



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Navigating Menus

The Up, Down, Left, Right, Enter and Cancel buttons can be used to navigate through the menus. Menus are organised into lists; these can be scrolled through with the Up and Down buttons. To enter the selected submenu or option press the Enter button. Cancel will return you to previous menu, potentially discarding any unsaved changes made within the current menu. The Left and Right buttons are predominantly used to select which character is being edited in settings such as IP address or Frequency.

Status Screens

The first screen that will be displayed to the user is the status screen, depending on the mode that the unit is set to this will either be the Uni-directional control status screen (fig 1) or the Bi-directional control status screen (fig 2).

Fig 1. Uni-directional operation mode status screen

Fig 2. Bi-directional operation mode status screen

Uni-directional Status Screen

The Uni-directional control status screen has numbered channels that represent RCP's that the IDU can connect to. There can be a maximum of four RCP connections per IDU, although the unit may display less depending on licensing. Each channel can have two states; Connected or Disconnected.
When an IDU and RCP panel are connected a '✓' is displayed. '×' if disconnected. Right of these is the camera name. By default each camera name set to 'Camera' followed by the channel number, however these can be edited at any time via the IDU web-page.

In Uni-directional mode the IDU does not know, and therefore cannot tell the user anything about the transmit, receive or RX to Camera connection status.

Bi-directional Status Screen

Bi-Directional Control (BiDi) can be broken down into four main data paths, each of which must be configured for correct operation. The status of the BiDi connections are under state machine control, generating 5 pages of diagnostic information to assist in BiDi configuration, these are navigated using the UP/DOWN arrow buttons.

1. Home Status
2. Return Link Status
3. Forward Link Status
4. Panel Connection Status
5. Camera Connection Status

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Each screen has a number of possible states, reported as follows:

Home Status

- Not Ready - At least one of the four data paths are not currently connected or configured correctly.
- Sync - All four data paths are connected, but Panel and Camera are still initialising.
- Active - The system is initialised and operational.

Return Link Status

- Return Not OK - No valid data is being received on the return port. Check connections and settings from RX all the way through to the IDU.
- Return ID?? - Valid data is coming through however the Camera ID being returned from the RX does not match the Channel number on the IDU.
- Return OK - The IDU is receiving good return data from the RX.

Forward Link Status

- Forward?? - The state of the forward link cannot be determined as the return path is not correct.
- Forward Not OK - Forward link is known to not be OK. Check connections from the IDU to the ODU and camera control radio frequencies.
- Forward OK - Both Return and Forward links are both OK. The Bi-Directional link is established.

Panel Connection Status

- Panel?? - Status of the connection to the panel cannot be determined. This could be due to the “BiDi Panel Drop” option being enabled.
- Panel Not Ok - Connection to the panel is not established.
- Panel Sync - Connection to the panel is established, but not yet initialised.
- Panel OK - Connection is OK and ready to be used by an operator.

Camera Connection Status

- Camera?? - The status of the connection to the camera cannot be determined. This is likely to be due to the Bi-Directional link not being established.
- Camera Type? - RX has an invalid camera type selected.
- Camera Not OK - Connection between the RX and the camera is not established.
- Camera Sync - Connection to the camera is established, but not yet initialised.
- Camera OK - Connection is OK and ready to be used by an operator.

For a full description of BiDi setup please consult the BiDi Quick Start guide available on our website www.videosys.tv.

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Menu Structure

Pressing enter will move the user from the status screen to the main menu, this main menu allows the user to navigate to a category, these are as follows;

‘Camera Manufacturer’ – Allows the user to select a camera manufacturer, depending on the camera it might also guide the user through menus asking which camera models are being used. There are then options for Serial, Ethernet, Bi-directional or Uni-directional.

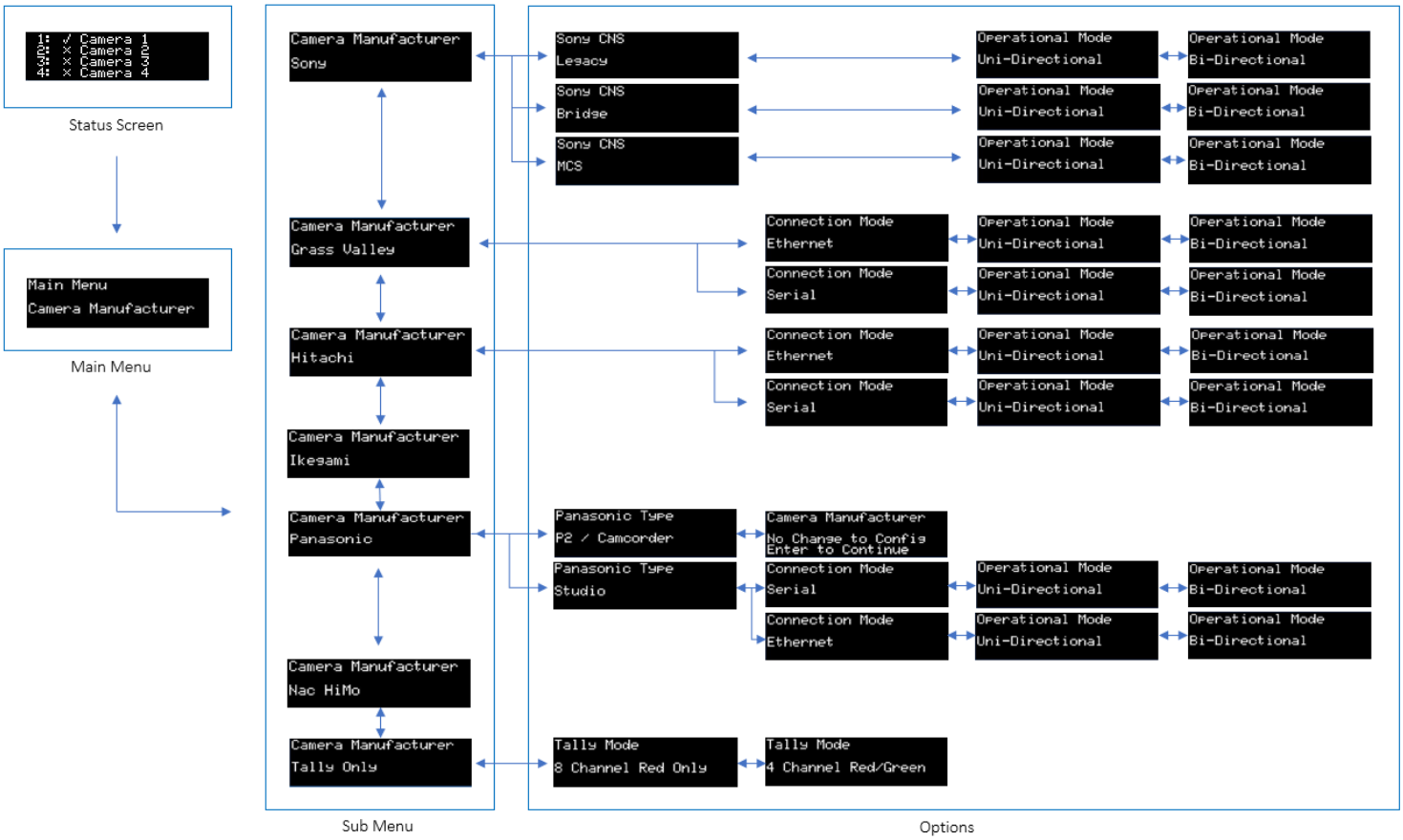
‘Camera Numbers’ – Sets which camera numbers are matched to which channels, these camera numbers are used to specify which receiver is listening for that data.

‘Network’ – Contains submenus for the IDUs IP settings, Channel IP settings and Camera Network settings. Channel settings are the IP addresses for panels to connect to via IP. Camera Network settings has manufacturer specific settings such as specific ports to use for connection.

‘ODU’ – Communicates with an ODU, displaying and allowing the user to modify the radio frequency and transmit power.

‘System’ – Contains a range of settings relating to the IDU itself, Serial numbers, Licence options, Data output, Paint settings reset and version information.

CAMERA MANUFACTURER



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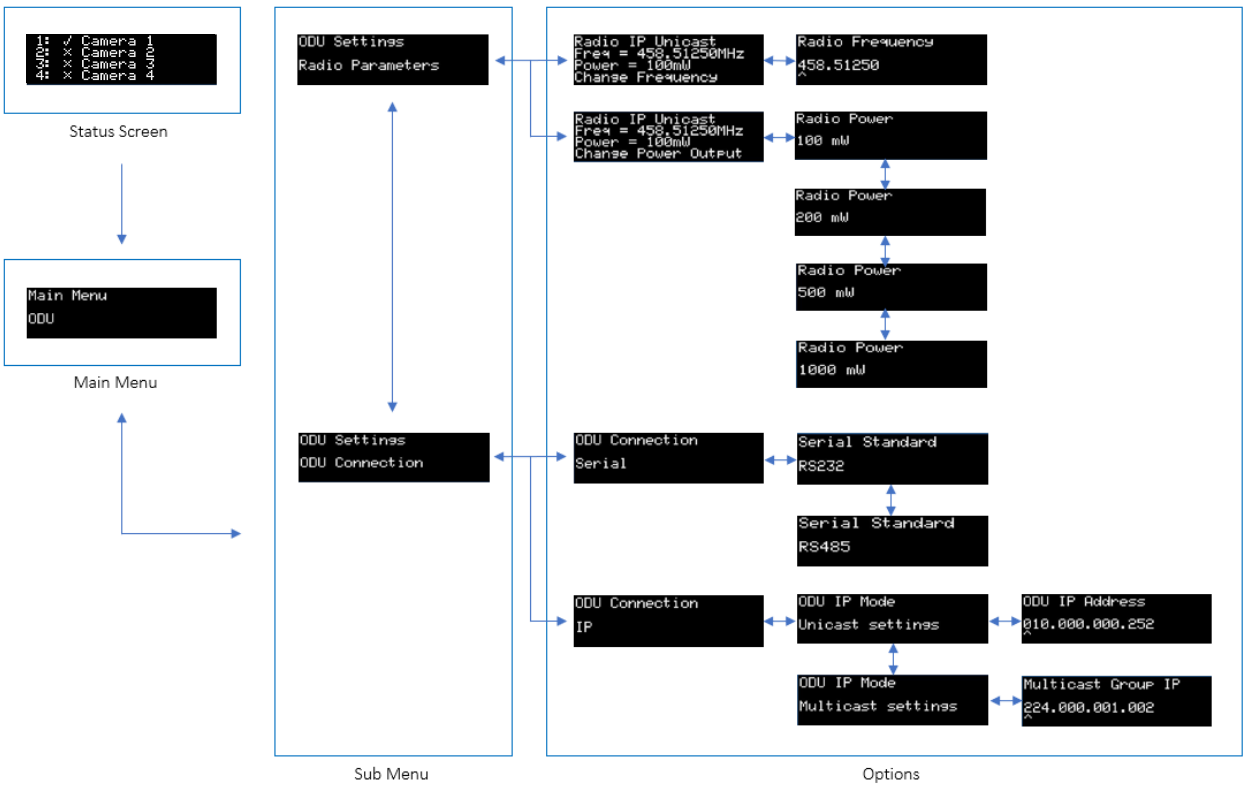
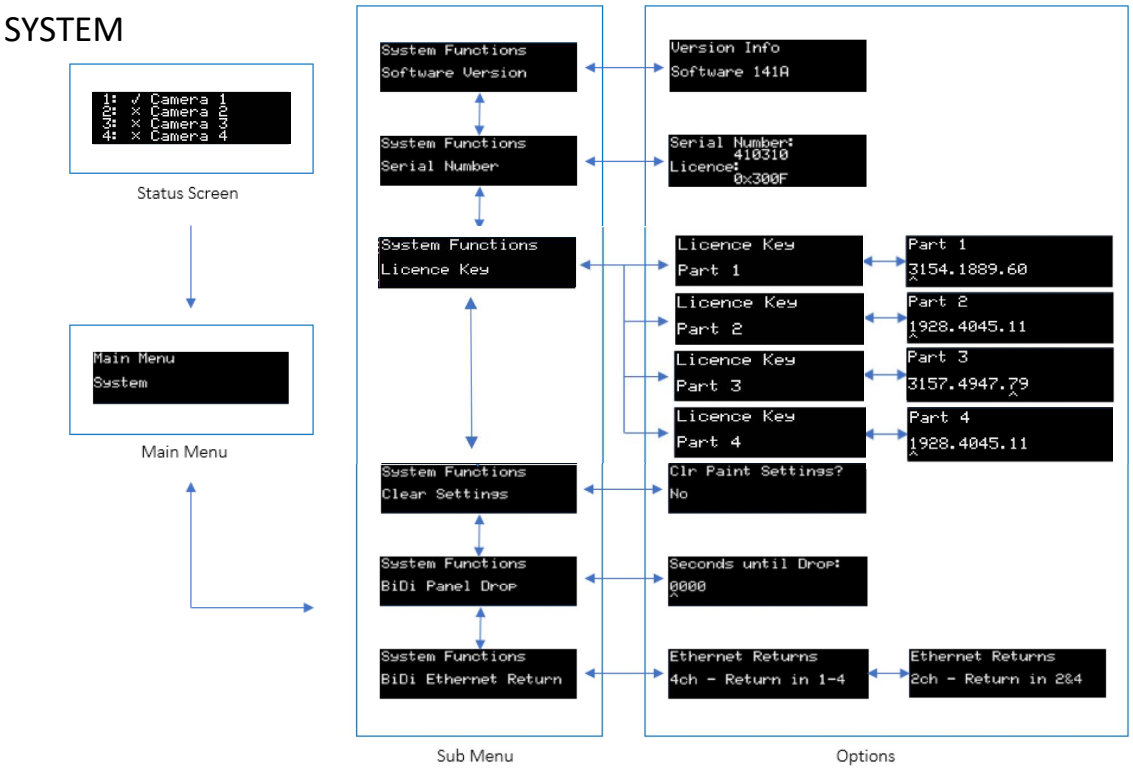
ODU



SYSTEM



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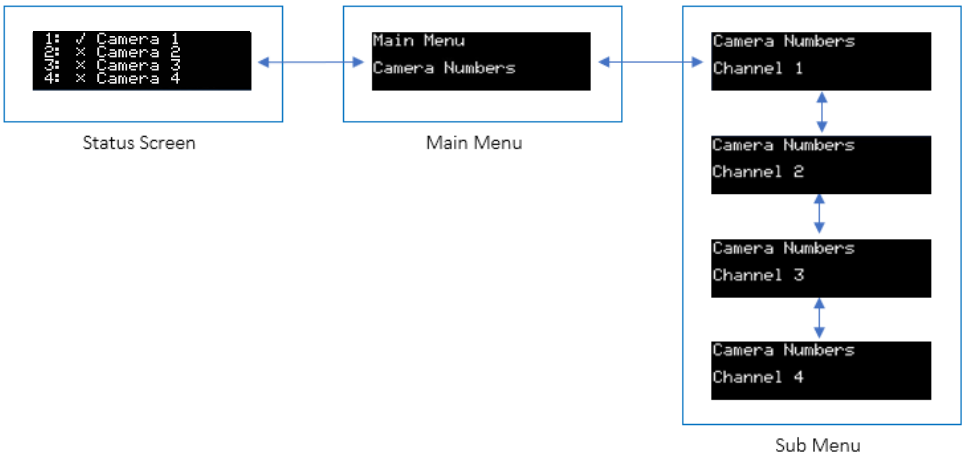
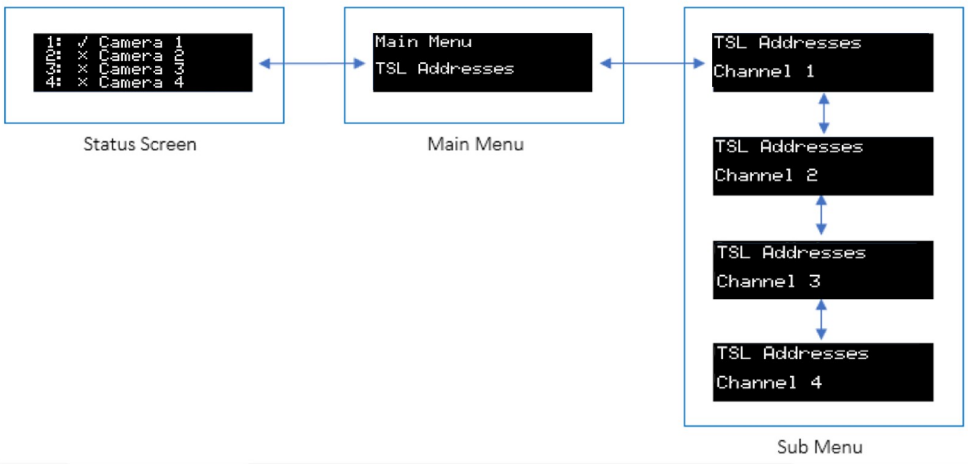
CAMERA NUMBERS



TSL ADDRESSES



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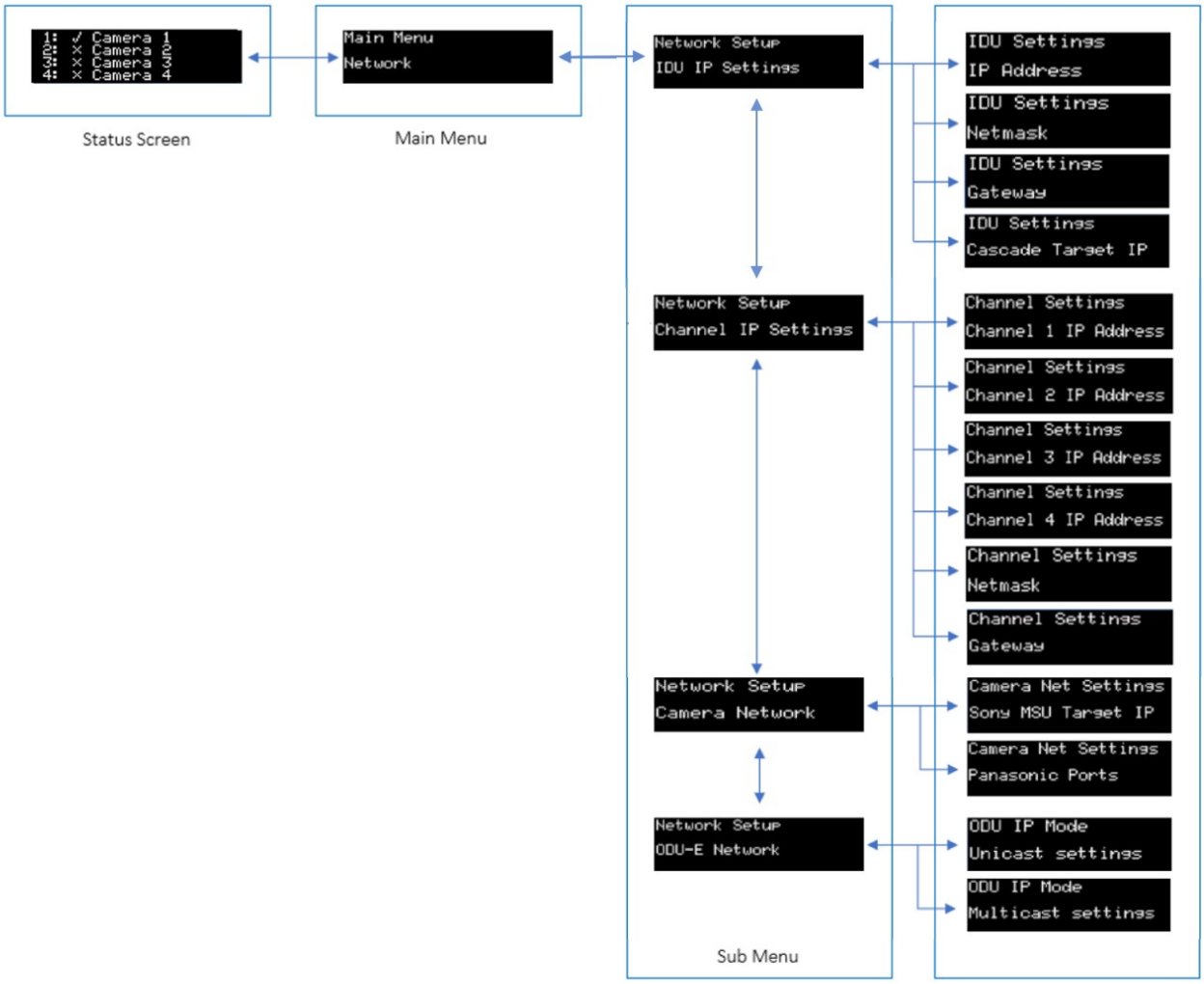
NETWORK



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Menu Item Descriptions

Main Status - Shows the connection status of the RCP to the IDU either connected or Disconnected, the camera number and if Red or Green tally is set for each port indicated by an R and a G.

Main Menu - This is entered from the Status screen by hitting the ENTER button. From here the user can access the Camera Manufacturer, ODU, System, Network and Camera Numbers menus. Note: some menu options may be license option specific.

Camera Manufacturer

From here the camera manufacturer type, subject to license option can be selected. The menu structure will take the user through a logical set of options for the connection type, serial or IP and the mode of operation Uni or Bidirectional control.

ODU

From the ODU menu the ODU and operation features can be accessed.

Radio Parameters - Shows the status of the radio in the ODU. The transmit frequency and the RF output power can be set. This will also display the current connection mode, serial or IP.

ODU Connection - Menu allows the selection of serial (RS232 or RS485) or IP (Unicast or Multicast).

System

Software version - Displays the current version of software installed.

Serial Number - Shows the unit serial number and installed license options.

License Key 1 and 2 - License Keys are issued as a two-part numbered code, key 1 and key 2 are entered in the appropriate window.

Clear Settings - Resets the RCP/OCP parameters back to 'centre' positions– all zeros on most panels. This is used for Uni-directional mode only.

BiDi Panel Drop - In Bi-directional mode some manufacturers panels will drop the connection as soon as the link is interrupted. This could be caused by interference or a simple battery change. The user can choose how long the panel will maintain the connection in seconds before it will be dropped. Default 0000s means infinite – the panel will never drop connection.

BiDi Ethernet Return - Allows the user to decide which ports the reverse data will input to the IDU, 4 channel operation the return ports are 1-4 or 2 channel operation the return ports are 2 and 4.

Camera Numbers

Channel 1-4 The production camera numbers can be set for each port 1 through to 4. This becomes important when using IP panel connections as some manufacturers use the camera number to identify the panel to camera data connection.

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TSL Addresses

From software version v148 and onward tally control will be compatible with TSL UMD V3.1 protocol at port **1081.** Channels 1-4 can each be allocated a TSL address number, TSL numbers can range from 0-126. If the TSL address number is 0 then the Tally status will be controlled by any physical tally box connected through the rear panel. However, if the values are set to anything from 1-126 then the tally TSL protocol is allocated control.

Network

IDU network connection parameters. The default IP range for the unit is 192.168.1.xxx. NOTE - IP set up is far easier using the web browser.

Chanel IP Settings- Static IP addresses for each connection port 1 to 4. Plus, **Gateway** and **Netmask.**

Camera Network- Sony MSU address and Panasonic RCP port addresses are entered here.

ODU-E Network- Settings for the ODU connections. These are duplicate menus as seen under the **ODU** sub-menus.

IDU IP Settings- Unit IP settings.

IP Address– The main IP address for the unit and is used to access the web browser. The default IP address id **192.168.1.200**.

Netmask, Gateway- Unit Netmask default setting **255.255.255.0** default gateway **192.168.1.254.**

Cascade Target IP - Used to cascade IDU's together allowing more cameras to be controlled over a single ODU. The target is the main unit IP address of the next IDU in the cascade.

NOTE - This also used to be used for the target address of the ODU when using the ODU in IP connection mode. This has been superseded, the Cascade Target must not be used to target the ODU, the ODU now has its own IP address entry menu.

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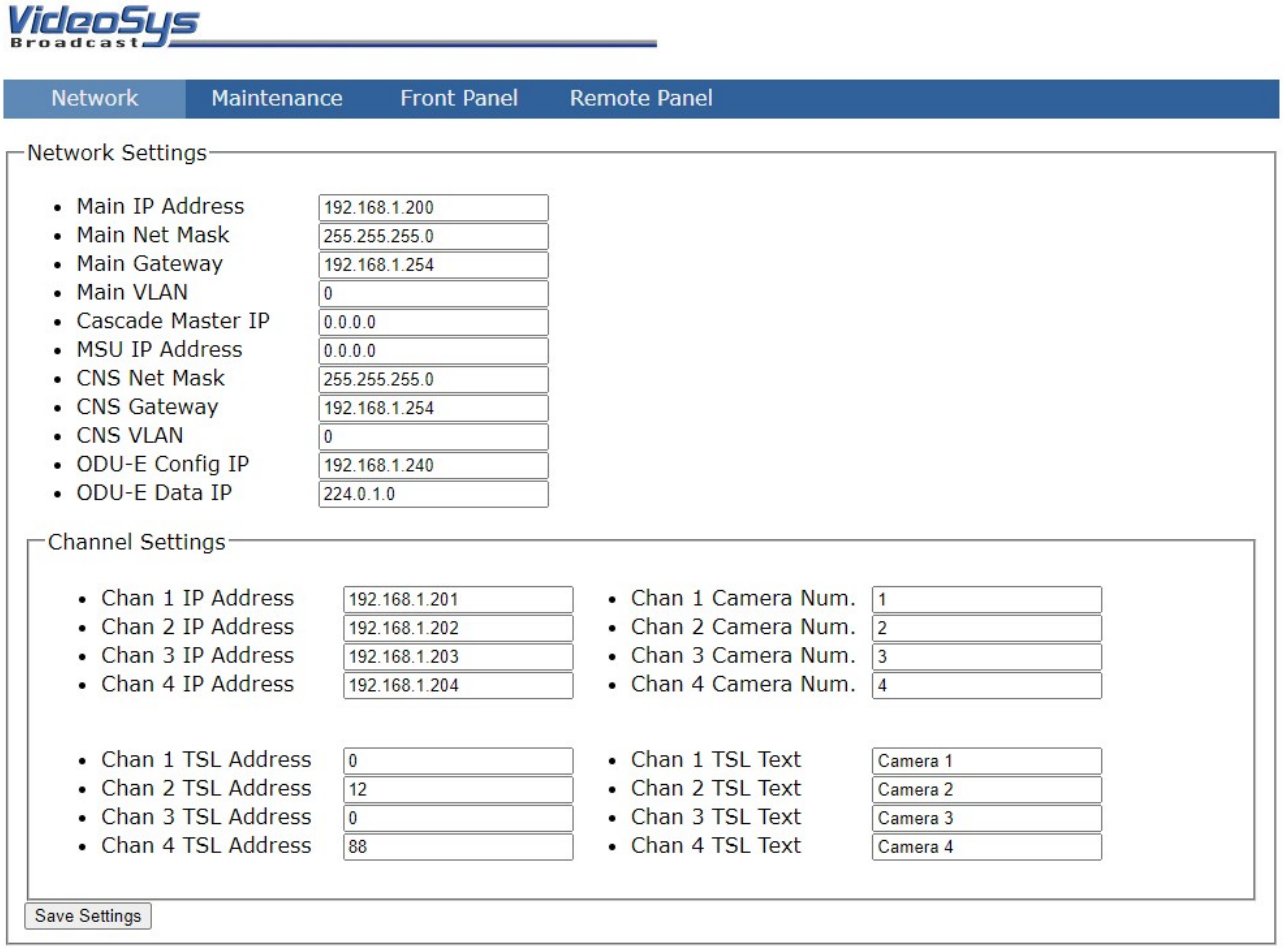
Web Interface

The IDU has a built-in webserver and serves a range of useful control pages, if the user has a device with a web browser on the same network, they can use this interface to quickly change settings, perform updates and utilise the virtual RCP feature.

Fig 3. The IDUs Network Configuration Webpage

Accessing the Web Interface

To Access the Web interface, firstly power up the IDU and connect a PC or laptop up to the same IP network as the IDU. Find the IP address of the IDU (this can be found via Network -> IDU settings -> IDU IP Address) and enter this into the web browser, this will take the user to the IDUs configuration web page.
VideoSys default IP address for the IDU is 192.168.1.200.



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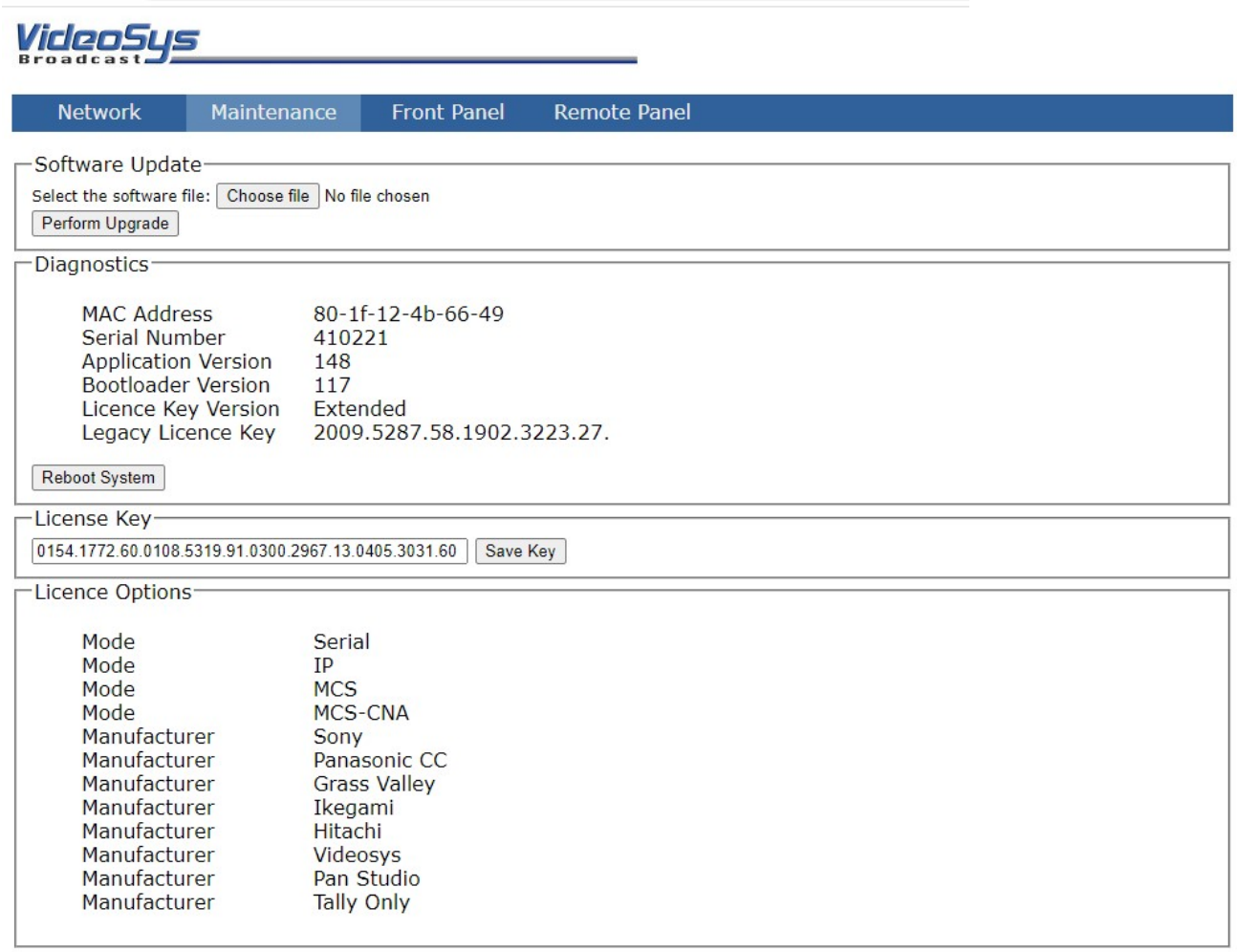
Navigating the Web Interface

Once the webpage has loaded (see 'Accessing the Web Interface') the 'Network' Page is then visible (fig 3), from this page the unit can be easily and quickly configured as part of an IP network. There is also a 'Maintenance' page (fig 4), giving device information and allowing for updates (these can be found on our website).

Fig 4. The IDUs Maintenance Webpage



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Navigating the Web Interface

The 'Front Panel' page (fig 5) literally mirrors the information presented on the IDUs front panel and allows for all of the same functionality as the units' physical front panel. There is also a 'Remote Panel' page *(fig 6)*; this is a 'Virtual RCP' and allows for all of the settings that we support in Uni-Directional mode to be controlled directly from the browser.

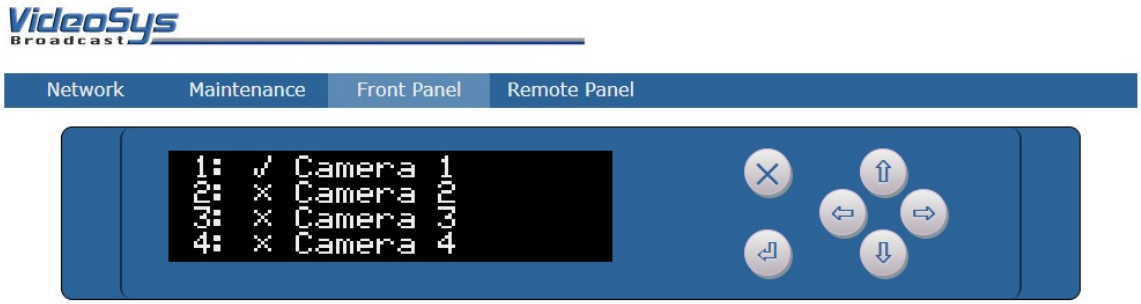

Fig 5. The IDUs Front Panel Webpage

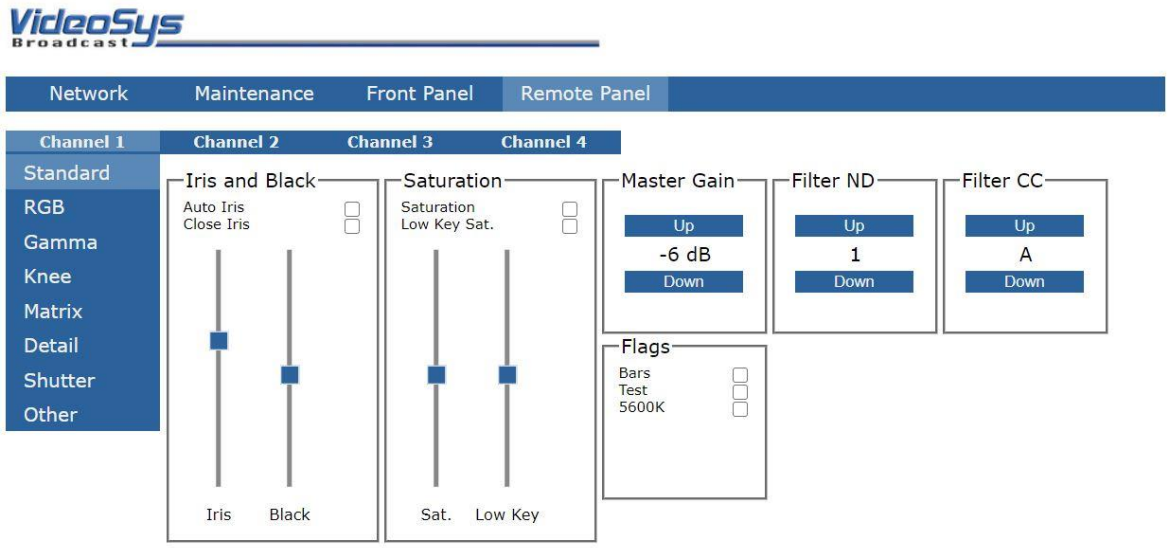

Fig 6. The IDUs Remote Panel Webpage

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Supported Cameras and Commands

The vast majority of commands that would be used day to day are available via Uni-directional control, and the full command set should be available via Bi-directional control.
For a full list of supported cameras and commands please see the software release notes provided with our software updates, software updates are regularly released and we hope to keep our range of supported cameras expanding. If you do not find the information required or would like assistance, please contact us.

Backwards Compatibility

We have multiple generations of hardware, which due to our commitment to backwards compatibility can, in the vast majority of cases, still be used to build a high-performance camera control system. For integrating new components into a previous generation system, some of our latest features might not be available. Please check our software release notes for the version that you are running or contact our sales department for more information.

Unit Updates

To update an IDU, a new firmware image is required, these are available on our website. Please check the release notes bundled with the firmware images carefully, they will explain precisely what changes have been made. The next step is to access the webpage (see 'Accessing the Web Interface'). On the 'Maintenance' page (fig 5), there is a software update section, this section can be used to select and upload the file required. During the update the IDU will show it is restarting and then that is the update completed. Further questions regarding which firmware images should be used or for any additional support please contact your local distributer.

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Physical Parameters

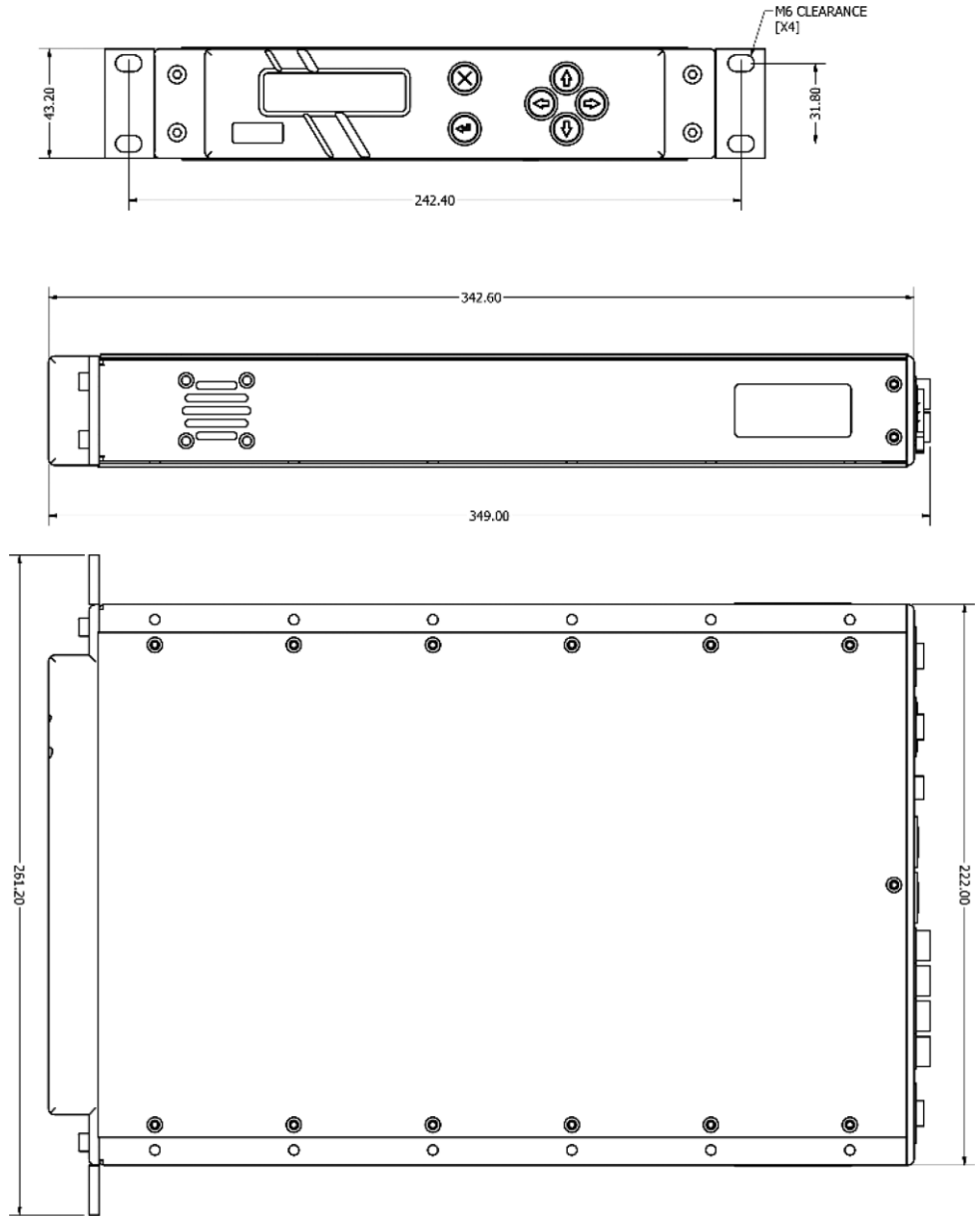
Dimensions

Width: 220mm excluding rack ears 262mm with rack ears.
Height: 44mm
Length: 349mm
Weight: 1.15kg
Weather proofing: None
Temperature Range: 0-50 °C
Sound Output: 0db - Fanless

Electrical Parameters

Operating Voltage: 9-18V
Current Consumption: > 1A

Be aware that RCPs can be powered up via the IDU, this will increase the current draw significantly.



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