

# VideoSys

## Broadcast

### ***Broadcast Camera Control System User Manual Version 2***



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## Declaration of conformity

The Videosys Broadcast Camera Control system is labelled with the CE marking. The system has been assessed as conforming to the relevant parts of Directive 1999/5/EC.

A declaration of conformity is available from Videosys Broadcast upon request.

Attention is drawn to the warning exclamation mark after the CE mark as below:



This notification informs the user that the product is a class 2 radio product, and as such is capable of operating over a range of frequencies. **The user is responsible for ensuring that they have appropriate permission from their local spectrum authority before using the system.**

Users in North America should be aware that the frequency band 406.0 – 406.1 is reserved for Government use, and the use of this system in this frequency band without a permit is forbidden.

## Restrictions and warnings

The Camera control system is capable of operating over a range of frequencies, the user is responsible for ensuring they have Permission from their local spectrum authority before using the system, both for frequency allocation, and power output. Videosys broadcast and their distributors accept no responsibility for the use of the system in an unlawful manner.

Before connecting power supplies, the user is responsible for ensuring any power supplies connected to the system are of a correct voltage and polarity.

If the system is used in close proximity to High power transmitters (e.g. Mobile phone base stations), Videosys recommend the use of a filter in line between the antenna and ODU. If the system is used where there is a risk of lightning strikes, appropriate Protection should be installed. Videosys can advise on the use of filters and lightening protection if needed.

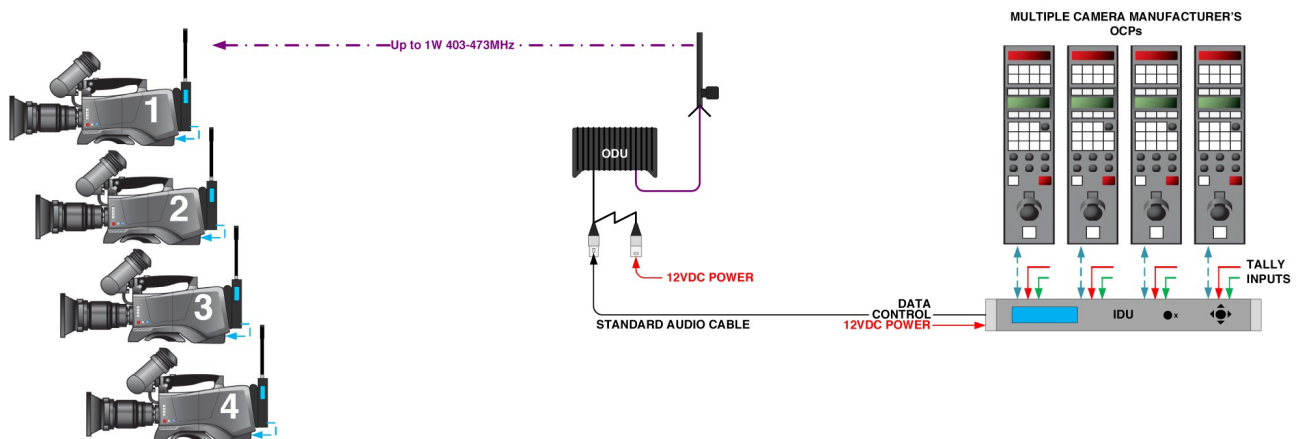
## 1. Introduction

Your new Videosys Camera Control System enables you to control up to 4 cameras on a single UHF channel with the camera manufacturer's own RCP. The system is easy to configure, and the radio frequency is programmable via the daylight readable display, using **your own** licenced frequency between 403Mhz and 474Mhz.

The system comprises 3 core elements.

1. The Indoor Unit (IDU) - set up in the broadcast control facility.
2. The Outdoor Unit (ODU) - set up within RF range of the cameras.
3. The Camera Processor (CCAM) - mounted onto the camera.

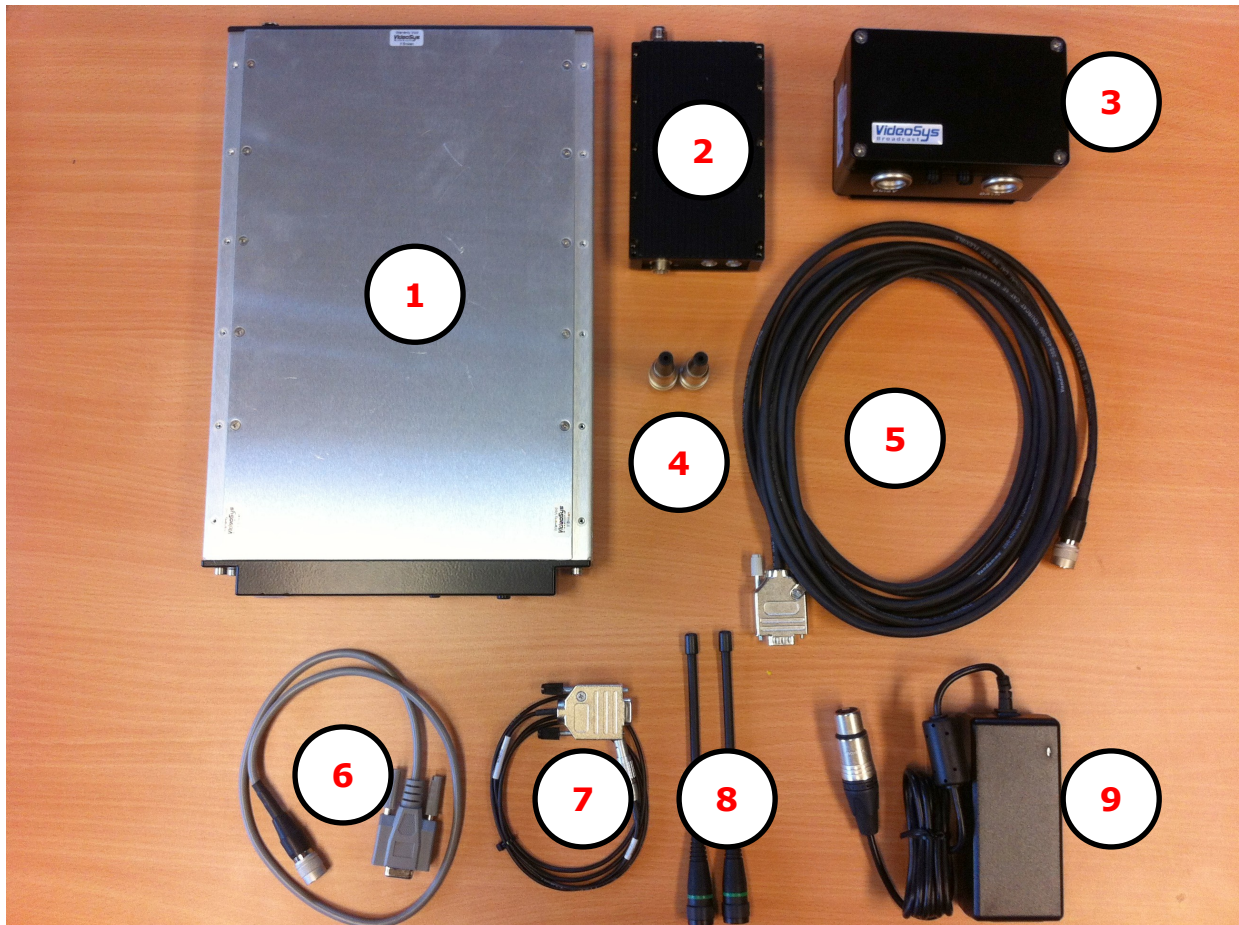
The diagram below shows how a system is connected.



The camera RCPs are connected to the IDU which receives their control data. The IDU sends the control data to the ODU, and the ODU transmits the data via RF to the camera processor. The camera processor then sends the data to the camera via a cable to the camera's 'remote' port.

## 1.2 What's in the Box?

A standard system consists of:



1. 1 x IDU
2. 1 x CCAM
3. 1 x ODU
4. 2 x Tally connector (unterminated)
5. 1 x RCP cable (supply depends upon system requirements)
6. 1 x 30 cm camera data cable (Grass Valley pictured)
7. 1 x Radio programming cable
8. 2 x Radio antenna
9. 1 x 12vDC power supply

We can also supply these optional accessories:

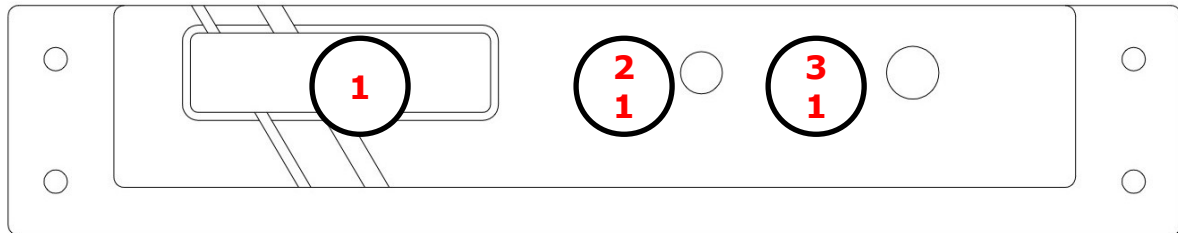
- 19" 1RU Rack mounting kit
- RCP control data cable (manufacturer specific).

\* Please also note that users will need to provide a 3 pin XLR cable of the desired length to connect the RS485 data out of the IDU to the data in of the ODU and a suitable 12VDC supply, in compliance with local power regulation legislation to power the ODU.

## **2. Controls and Connections**

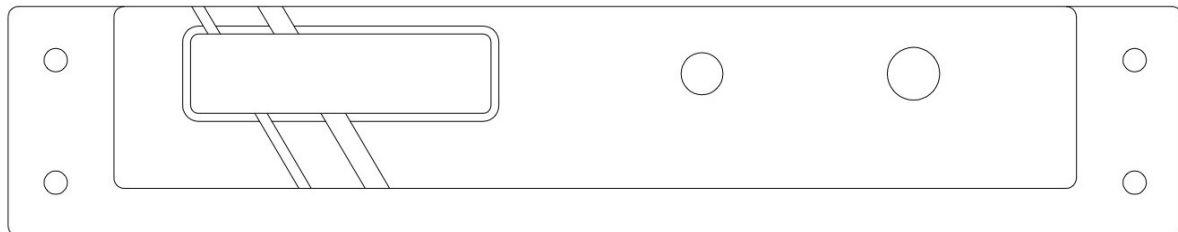
### **2.1 The Indoor Unit (IDU)**

The indoor unit receives data from the camera RCPs and sends this data via a 3pin XLR cable to the ODU. The LCD screen and navigation buttons are used to control and interrogate both the IDU and the ODU, so the unit should be installed so that the front panel is easily accessible.



#### **Front Panel**

1. LCD Display
2. Cancel button
3. NAV button - up/down/left/right/ENTER



#### **Rear Panel**

1. 12v DC in
2. RCP connection ports (1-4)
3. Green Tally
4. Red Tally
5. USB Port
6. Data Out

The camera control panel (not supplied) should be connected using the suitable data cable (not supplied) to one of the 4 ports on the rear panel, labelled RCP 1 - 4. The port number relates to the ID that panel will have within the system - ie. a panel connected to port number 1 will have a system ID of 1.

Up to 4 panels can be connected at any one time to control a maximum of 4 independent cameras. In the case of the Sony control panel, the ID/Port number will be indicated on the panel in the Tally Display area.

Once the control panel(s) are connected, the RS485 data output should be connected to the ODU. This can be done via standard balanced audio cable as a single pair or as part of a multi-cable audio loom. 3 pin XLR connectors are used, utilising the standard pin configuration. The Data should be capable of correct operation over a distance of 1km, depending on the quality of the cable used.

## **2.2 Status Display**

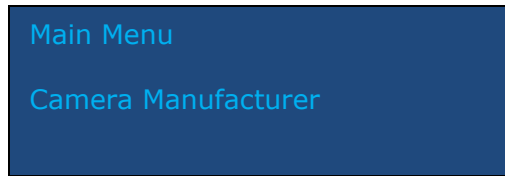


When the unit powers up, the Videosys logo should be seen on the LCD screen, followed by the home status. The home status display shows the status of each RCP connection. It is reported simply as either 'Connected' or 'Disconnected', as shown above. Notification of a Tally to that port is indicated by 'R' for RED Tally and 'G' for GREEN tally.

## **2.3 Main Menu**

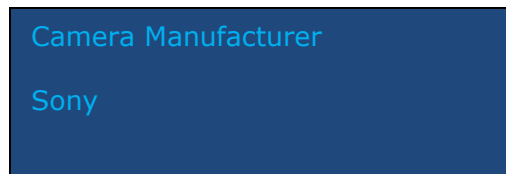
Pressing the NAV button once brings up the Main Menu.

### 2.3.1 Camera Manufacturer Status



The first available option enables you to set the camera manufacturer. By tipping the NAV button up and down you can choose from: Sony; Panasonic; Grass Valley; Ikegami; and Hitachi, if the relevant licences have been purchased.

Once the desired manufacturer has been found, press the NAV button once to select. The display will revert back to the Manufacturer Status.

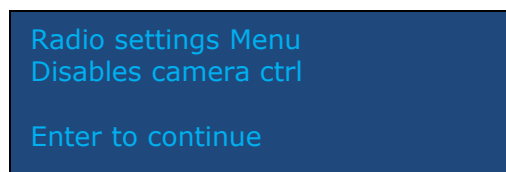


**NOTE:** Once the selection has been made, the unit must be power cycled so the relevant control software can be initialised by the internal processor.

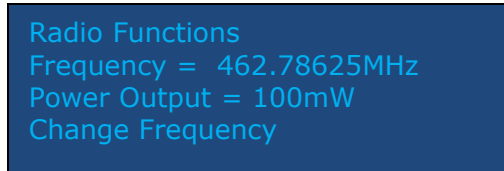
### 2.3.2 Radio Status



The frequency and the power output of the ODU can be remotely controlled from the IDU. When the NAV button is pressed once a warning will be displayed. This is because the transmission of camera control data will be interrupted while the ODU is interrogated and no cameras can be controlled. This process is usually done during installation and should not normally be necessary during a program transmission.

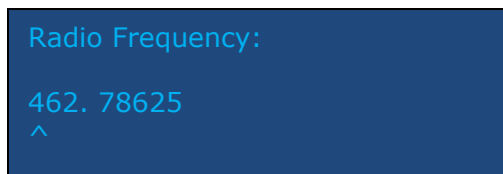


Feedback from the ODU of the Frequency and Power level will be displayed and on the bottom line of the display the desired edit function can be selected between, frequency and power level.



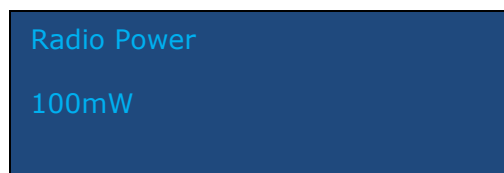
### **2.2.3 Frequency Selection**

If Frequency is selected and the NAV button is pushed once, the display will enter frequency edit mode. Using the NAV button, left, right, up and down the frequency can be entered one digit at a time then the NAV button pushed once to select. If a frequency outside of the range of the radio is selected, there will be an ERROR report and the ODU will revert to the previous frequency.



### **2.2.4 Power Output Level**

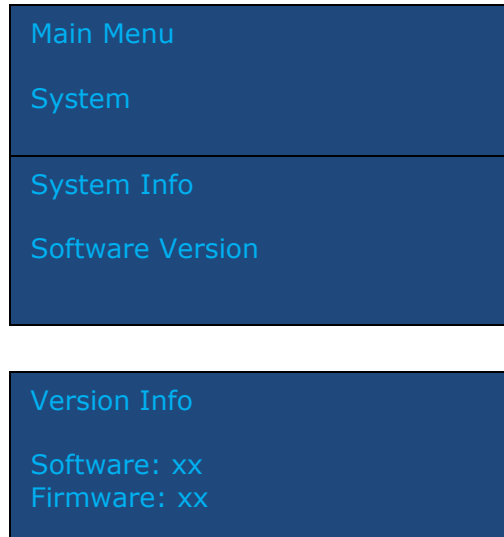
If Power Level is selected and the NAV button is pushed once, the display will enter power edit mode. Using the NAV button, left, right, up and down the power output level can be chosen. When the NAV button is pressed once, the selected power level will be programmed for power between 100 milliwatts (mW) and 1 watt.



When either the frequency or the power level is set, on completion of the ODU programming the display will revert to the Radio Status Page. Camera control will not be restored until you have exited the Radio Status page. In the event the user does not exit the display, the unit will revert to the Radio Status Page after a 10 second time-out and camera control will be automatically restored.

### 2.2.5 System

The system menu is used to report the current software and firmware versions installed. The software version can be checked by selecting the 'System' menu and pushing the NAV button once. The display will read 'Software Version'. Pushing the NAV button again the display will show the current version.



The current versions should be checked periodically, as they may contain extra features and bug fixes. The latest version information is available at <ftp://videosys.no-ip.org>. If a newer, relevant version is available, it can be downloaded as a self executing file.

### 2.3 Updating Software and Firmware

Software and firmware updates are easily installed using a PC with a USB port. A USB driver is also necessary to complete the process. It is supplied as part of Windows 7. For Windows XP users, it can be downloaded from <ftp://videosys.no-ip.org>. Both 32 and 64 bit versions are available. The Windows 7 version is available.

***To perform the update:***

Connect a PC to the IDU via a USB cable. Click on the .exe file to start the installation. If it is the time you have connected to the IDU, Windows will report installation of the COM port. Note the COM port number allocated, for example, COM3.

Once the USB connection made, the file can be executed. The file will test to see if there is a connection. You will be prompted to select the COM port number. Once selected, press enter. The program will self install and reset the device on completion. After the update has completed the software version should be checked and noted.

Instructions on how to download and install the updates are also available in the folder marked 'Guides' on the Videosys ftp site.



### 3. Outdoor Unit (ODU)

The outdoor unit (ODU) is a UHF radio modem. The unit receives control data down a 3 pin XLR cable from the data output of the IDU, and transmits this data to the camera. It should be installed such that there is a clear line of sight over the desired working area to ensure the best possible reception at the camera. UHF signals can penetrate through some objects, but operation over distance can be severely impeded if obstacles exist between the transmit and receive modules.

be



but

impeded if



obstacles

exist between the transmit and receive

#### 3.1 Connections

1. 12v DC in
2. Data in
3. Antenna connection
4. Control in (radio programming port)

Power is applied via the 4 pin XLR and indicated by a green LED. If the power LED illuminates RED, this indicates the power is reverse polarised. The RS485 Data is applied via the 3pin XLR connector with the standard audio pin configuration. The data LED will flash green when it receives data from the IDU.

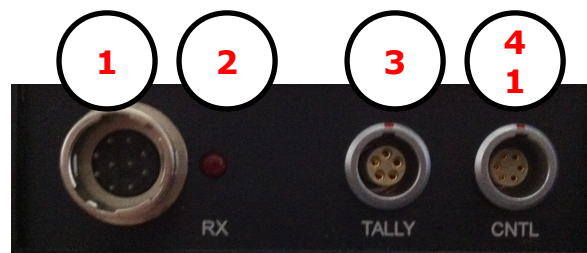
The Control connection (CNTL) is used for advanced set up of the radio. This is pre-set in the factory and does not normally require any set-up. See appendix for further information.

The antenna is connected to the TNC style connection on the top of the unit. The ODU is supplied with a 400Mhz DiPole antenna, but other antennas can be used where required.

Care should also be taken when installing the ODU. Although it is supplied in a 'splash' proof housing, if the unit is to be used in open areas, it should be covered with appropriate weatherproofing to protect it from water and direct sunlight. If it is to be installed at a high vantage point, provision should be made for lightning conduction.

#### **4. Camera Processor (CCAM)**

The CCAM unit receives the RF signal containing the camera control data from the ODU, and then sends it to the camera via a cable connected to the camera's 'remote' port.



1. Camera control data output
2. Data RX indicator
3. Tally output
4. Control - used for radio programming and advanced features

##### **4.1 Connecting to the camera**

###### **Data**

The camera processor (CCAM) connects to the camera using the supplied data cable. This cable also supplies the power to the unit. The CCAM should be connected **before** the power is applied to the camera. This is because some cameras only read the data ports on power up.

###### **Tally**

External red and green tally is available on this connector, 5 pin OB Lemo connector (see appendix for pinouts). It is open collector and unregulated

+V/ 75mA is available for an LED. A reverse protection diode is included to allow a small signal relay if larger current control is required.

## **Control**

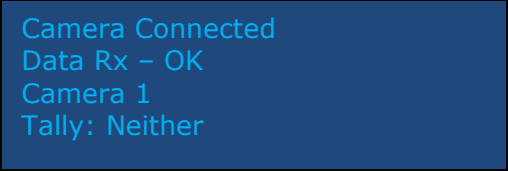
External control of the radio modem is available. This is pre-set in the factory and does not normally require any set-up. See appendix for further information.

## **Antenna**

The antenna is connected to the TNC style connection on the top of the unit. The unit is supplied with a 400Mhz DiPole antenna, but other antennas can be used where required.

## **Unit Status**

When power is applied the Videosys splash screen should appear and then the Unit Status will be displayed.



```
Camera Connected
Data Rx - OK
Camera 1
Tally: Neither
```

## **Camera**

Indicates whether or not the camera data connection is good. If the state reported is disconnected, the most likely cause is the wrong camera manufacturer is selected.

## **Data RX**

Indicates if the data received is valid. Used in conjunction with the data RX LED on the base of the unit data communication problems can be diagnosed. The LED indicates the radio modem has received a carrier, but does not indicate the presence of valid data. If the LED is flashing, but the Data RX on the display indicates ERROR, this can mean either the camera ID is set incorrectly and there is no valid data for the ID currently selected. It could also mean the that RF signal is being interfered with.

## **Camera ID**

Indicates the current unit ID. This relates to the port the user has selected on the IDU to control that particular camera.

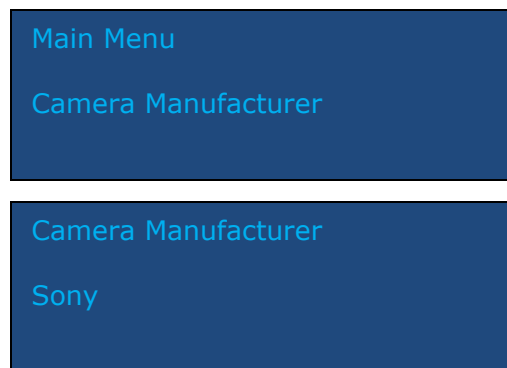
## **Tally**

Indicates when a tally signal has been received from the IDU. The tally status display will read as one of the following:

- Neither
- Red
- Green
- Both

## **Camera Manufacturer Status**

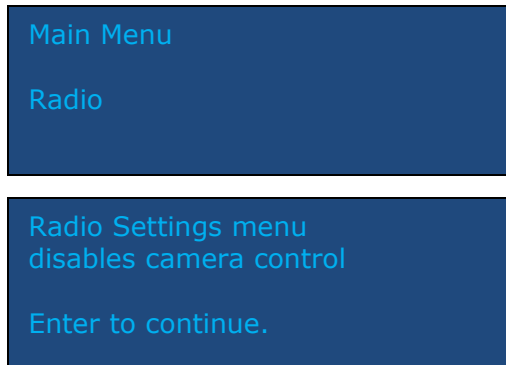
If the NAV button is pressed once the Camera manufacturer menu is displayed. By tipping the NAV button up and down different manufacturers can be chosen and selected, if the relevant license has been purchased. When the desired manufacturer has been found, the NAV button is pressed once to select. The display will revert back to the Manufacturer Status menu.



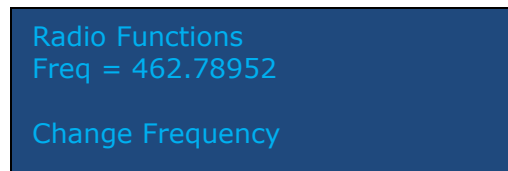
**NOTE:** Once the selection has been made, the unit must be power cycled so the relevant control software can be initialised by the internal processor.

## Radio Status

The frequency of the CCAM can be controlled from the panel. When the NAV button is pressed once a warning will be displayed. This is because the reception of camera control data will be interrupted while the radio modem is interrogated and no cameras can be controlled.



This process is usually done during installation and should not normally be necessary during a program transmission. The current frequency will be displayed and the edit function can be selected from the bottom of the display if required.

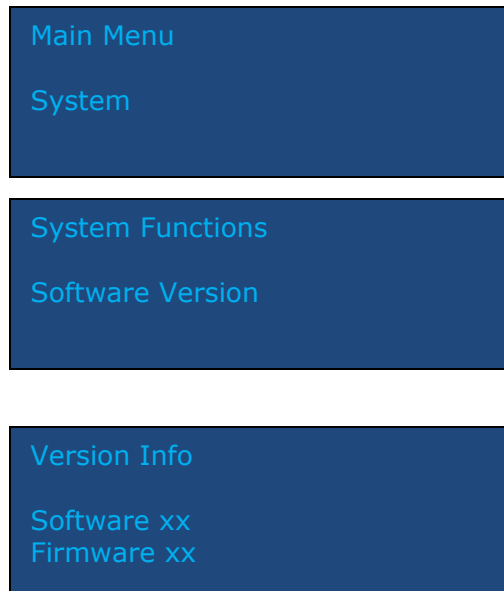


When Frequency is selected and the NAV button is pushed once, the display will enter frequency edit mode. Using the left, right, up and down on the NAV button, the frequency can be entered one digit at a time then the NAV button pushed again to select.

If a frequency outside of the range of the radio is selected, there will be an ERROR report and the CCAM will revert to the previous frequency. On completion of the modem programming, the display will revert to the Radio Status Page. Camera control will not be restored until the Radio Status page has been exited. In the event the user does not exit the display, a 10 second time-out will automatically restore the unit to the Unit Status display and camera control will be restored.

## System

The system menu reports the software and firmware versions currently installed on the device. If the system menu is selected and the NAV button is pushed once, the software version can be checked. The display will read Software Version, if the NAV button is pushed once, the display will show the current version.

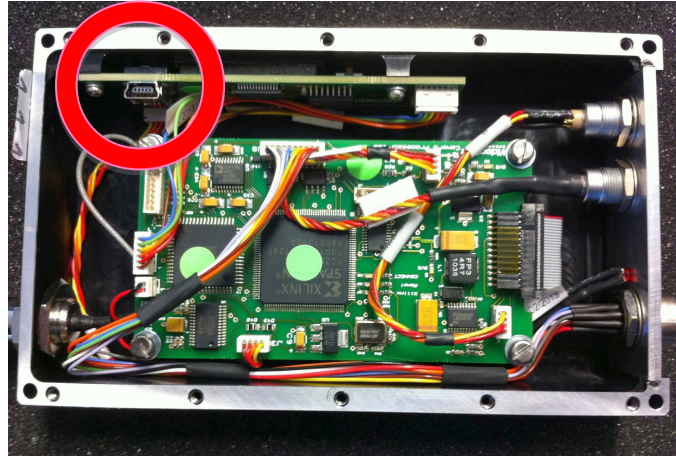


As with the IDU, the current versions should be checked periodically, as they may contain extra features and bug fixes. The latest version information is available at <ftp://videosys.no-ip.org>. If a newer, relevant version is available, it can be downloaded as a self executing file.

Software and firmware updates are easily installed using a PC with a USB port. A USB driver is also necessary to complete the process. It is supplied as part of Windows 7. For Windows XP users, it can be downloaded from <ftp://videosys.no-ip.org>. Both 32 and 64 bit versions are available. The Windows 7 version is available.

**Before performing the update:** Please note that the software and firmware version numbers must match for both the CCAM unit and the IDU. The system will not work otherwise. If you have not done already, perform the update on the IDU immediately after updating the CCAM unit.

**Please also note:** As the mini USB port used to update the CCAM is inside the unit, to perform this update, the top cover must be removed. Please contact your Videosys dealer before doing this so as not to invalidate your warranty. The location of the port is indicated below.



**To perform the update:**

Connect a PC to the IDU via a USB cable. Click on the .exe file to start the installation. If it is the first time you have connected to the CCAM, Windows will report installation of the COM port. Note the COM port number allocated, for example, COM3.

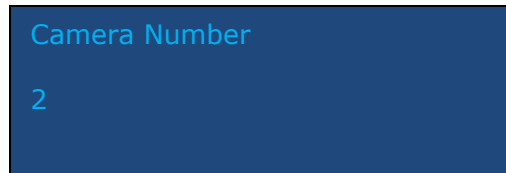
Once the USB connection made, the file can be executed. The file will test to see if there is a connection. You will be prompted to select the COM port number. Once selected, press enter. The program will self install and reset the device on completion. After the update has completed the software version should be checked and noted.

It is recommended the IDU is power cycled on completion and the correct camera manufacturer is selected.

Instructions on how to download and install the updates are also available in the folder marked 'Guides' on the Videosys ftp site.

## **Camera Number Status**

The camera number of the receiver unit should be set to the same port number on the IDU you wish you use to control that specific camera - ie. if your RCP is connected to IDU port 2, then the camera number should be set to camera 2.



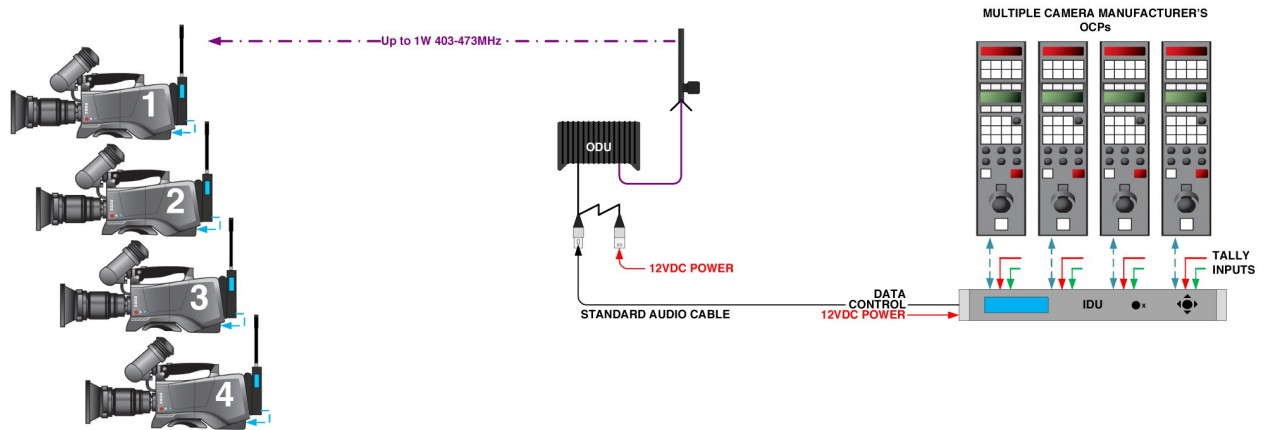
If the camera number is set incorrectly you will not gain correct control of the desired camera. For instance, if there is only 1 RCP connected to the IDU on port 1 and the camera number is set to camera 2, there will be no camera control at all and the main status will indicate 'Data ERROR' This is because there is no valid data for this camera number receiver.

If however there are two RCP's connected to port 1 and port 2 and the camera number is set to 3 or 4, the same result will be observed. If the camera number were set to be the same on both camera receivers, then both camera receivers would be controlled by the same IDU port.

It is thus very important that correct camera number is entered during set up of the equipment for correct operation.

## Quick Setup Guide

This diagram shows the general set up for a 4 camera system.



To set up control for one camera, you need to...

1. Power up the IDU and connect your camera's RCP to the port labelled RCP 1 on the rear panel. To add more cameras, repeat the process using RCP 2 and so on.
2. Check/Set the correct camera manufacturer data is being transmitted.
3. Check/Set the desired radio frequency on the IDU via the menu.
4. Connect a 3 pin XLR cable from the 'data out' connector on rear panel of the IDU to the 'data in' rear panel of the ODU.
5. Connect the antenna to the ODU.
6. Power up the ODU by connecting an appropriate 12v power supply.
7. Mount the CCAM unit onto the camera and connect the data cable to the camera's 'remote' port.
8. Check/set the correct camera manufacturer's data is selected.
9. Check/Set the desired radio frequency on the CCAM unit.
10. Connect the data cable to the camera's remote control port.

If there is no camera control after going through this process, please refer to the detailed instructions in the relevant sections of the manual, or the troubleshooting guide.

## **APPENDICES**

### **Appendix 1**

#### Connector Pinouts IDU

Power - 4 pin XLR

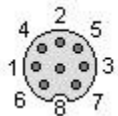
1. GND
2. NC
3. NC
4. +12-16VDC

RCP - Manufacturer dependent

Generic RCP Connection

1. TX (H)
2. TX (C)
3. RX (H)
4. RX (C)
5. GND
- 6.
7. RS232 TX
8. RS232 RX
9. +VDC OUT
10. GND

TALLY R/G - 8 pin DIN NOTE: The pin configuration of the DIN can be a little confusing, please see the picture to understand how it is numbered.



1. Ch1 (H)
2. Ch2 (C)
3. Ch3 (C)
4. Ch2(H)
5. Ch3(H)
6. Ch1 (C)
7. Ch4 (H)
8. Ch4 (C)

DATA OUT RS485 - 3 pin XLR

1. GND
2. DATA (H)
3. DATA (C)

### **Connector Pinouts ODU**

#### **Power - 4 pin XLR**

1. GND
2. NC
3. NC
4. +12-16VDC

#### **DATA OUT RS485 - 3 pin XLR**

1. GND
2. RS485 A (C)(-)
3. RS485 B (H)(+)

#### **Control - Lemo 6 pin 0B**

1. NC
2. NC
3. PRG (SHORT TO GND)
4. TX
5. RX
6. GND

### **Connector Pinouts Camera Processor**

#### **Cam Data - Manufacturer dependant**

#### **Generic Cam DataConnection**

1. TX (H)
2. TX (C)
3. RX (H)
4. RX (C)
5. GND
- 6.
7. RS232 TX
8. RS232 RX
9. +VDC OUT
10. GND

## **Tally Lemo 5 pin 0B**

1. GND
2. +UNREG
3. RED (Open Collector)
4. Green (Open Collector)
5. NC

## **Appendix 3**

### Making changes to the IDU Data Output Standard

This procedure is only available on units sold during or after July 2012. Units purchased prior to this can have the output changed, but will need to be returned to Videosys Broadcast and may be subject to engineering charges. Users who follow this procedure do so at their own risk. Videosys Broadcast cannot be held responsible for any personal injuries, damage to third party or Videosys Broadcast equipment as a result of using this guide.

This guide is for units that DO NOT have an FSK option card fitted. Output selection for these units are done via the system menu on the front panel.

#### **IDU Guide:**

Disconnect the IDU from the Power supply and all connected devices. Remove the 13 screws from the top plate of the IDU, revealing the main PCB. Locate the output select switch, close to the Data and USB connectors at the rear of the unit. Place switch into required position, as indicated on the PCB and shown in the picture below. Once this has been done, it will be necessary to change the standard on the ODU to match.

#### **ODU Guide:**

Disconnect the ODU from the Power supply and remove the data cable. Loosen the 4 captive screws on the front of the ODU until the front plate can be removed. Locate the output select switch, close to the DC input on the bottom of the unit. Place switch into required position, as indicated on the PCB and shown in the image below.

## **Output Standard - for units fitted with FSK option only**

The IDU's default data output standard is RS485. However, in situations where sending a data signal from the IDU to the ODU is not practical, the FSK option can be used. The installed FSK module (if purchased) converts the data into an audio signal that can be transmitted by the ODU and decoded by the CCAM unit.

### **IDU Guide:**

You can select the Output Standard menu by pressing the NAV button once, and scrolling down. Pressing the NAV button again will bring up the option to change to RS232, FSK, or FSK with 48v phantom power. Select the desired option by scrolling and pressing the NAV button again. The unit will display the currently selected data output standard. The same data standard should also be selected on the CCAM unit.



Output Standard RS232
Output Standard FSK Phantom Powered
Output Standard RS485
Output Standard FSK