



CAMCON

VISUAL RADIO CONTROL



MANUAL

version 1.04

Dear Client,

Thank you for choosing the D&R CAMCON (CAMera CONTroller).

The Camcon hardware was designed by Radio Broadcast professionals along with the D&R design team and is intended to be used as the control unit for Visual Radio Control (VRC) software Scene controller together with OBS in the most demanding production room.

We are confident that you will be using the Camcon hardware and VCR software for many years to come, and wish you lots of success.

We value suggestions from our clients and would be grateful if you could email us with your comments when you are familiar with the Camcon unit and its VRC software.

We learn from the ideas and suggestions of customers like you and appreciate your time taken to eventually do this.

And... we always appreciate nice studio pictures with the Camcon in use to include on our website.

Please mail them to sales@d-r.nl

With kind regards,

Duco de Rijk
md

CAMCON

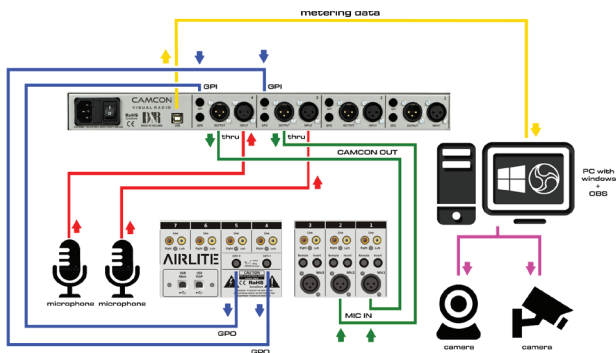
The “CAMCON (CAMera CONTROL Triggerbox)” measures microphone levels and sends these over a USB link to a PC where visual radio software runs.

The Triggerbox/CAMCON is very simple to use. The unit is placed in series with the microphone and the mixing console. This is a direct straight wire from input to output XLR and has no influence on your sound.

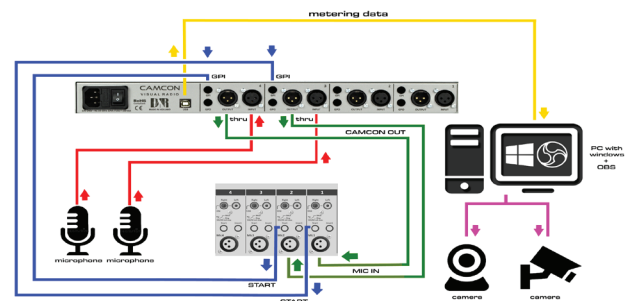
Do NOT insert a mic processor in between your Microphone and the CamCon!

Therefore each channel will have an XLR input and an XLR output that acts as a thru connector.

In order to support multiple microphones, the gain for the level measurement to switch camera's can be done on the front panel with one single push switch. NOTE, This has no influence on the Mic XLR signal and is only for internal measurement. This product needs to be used with the following software **CAMCON server software** (included), **Visual Radio Control (VRC)** (included) and **OBS** version 28 and up.



Wiring diagram for AIRLITE mixer

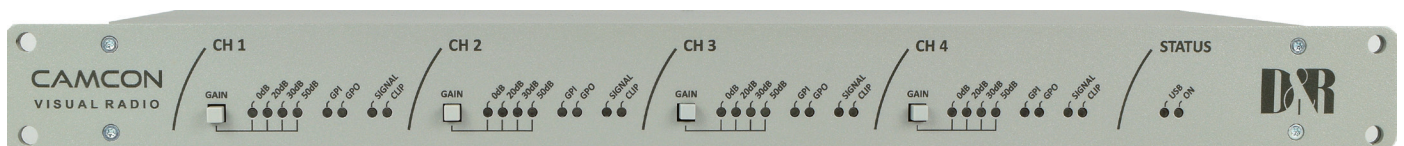


Wiring diagram for AIRENCE mixer



The CAMCON needs to be connected to a power source between 100 and 240 volt AC .

The USB cable (part of the delivery) needs to be connected from the USB plug at the back of the CAMCON to your PC where the software runs. Mic cables go in and out hardwired. The GPI and GPO jacks are wired on tip and ring, so stereo cables will work here.



On the front panel you can adjust the incoming Mic level with the pushbuttons, this can also be done in the software. Leds show the level settings and signal level. If GPI or GPO is active these corresponding leds will light. The Status leds on the right side of the frontpanel will indicate the unit is on and the USB connection is active. **Please connect the microphone directly to the CamCon XLR input and not through a processor.**

NECESSARY DOWNLOADS

Before you install the **Visual Radio Control (VRC)** software it is important to install the **Camcom application** software first and then the **OBS freeware**.

Only then the **VRC** software can find the links to both applications and then it will work as intended.

Let's start with the CAMCON software.

Go to the **www.dnrbroadcast.com** website and click on the tab **"Your Support"** and then choose tab **"Service information / FAQ"**


The D&R WIKI page will be shown. Select the Camcon device which brings you to the product page of the CamCon .








Now choose CamCon Control where the green arrow below points to, to start your download.

Note: You can ignore pop up screens warning you for malware.

In case you have malware protection that pops up. Choose "more info" and accept/continue.

FAQ - Camcon

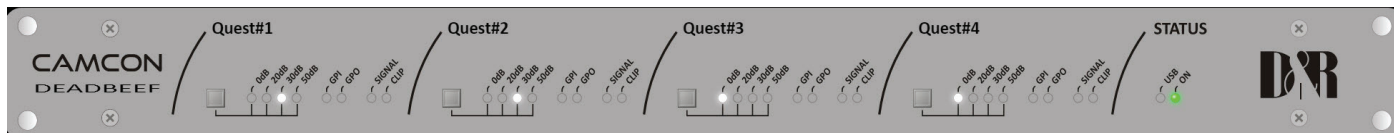
Model:	Production year
CamCon	2022
	
Brochure	Manual

Needed Software	Windows 7 	Windows 8 	Windows 10 	Windows 11 	MAC OS X 	Linux 	Manual & Info
Firmware Updatetool	v4.10 (Needs Java 32bits, Visual Studio and driver!)				N/A	N/A	PDF
AtLibUsbDfu.dll installer (Needed for Firmware update tool)	Driver X86 Driver X64 or Video AtLibUsbDfu.dll				-	-	-
Java 32 bits (Needed for Firmware update tool) (A)	Java X86				-	-	-
Visual Studio (Needed for Firmware update tool) (B)	Visual Studio				-	-	-
Camcon Firmware	FW v1.0 (01-01-2000)				-	-	TXT
Camcon Control	v1.0 				-	-	TXT
Optional Software	Windows 7	Windows 8	Windows 10	Windows 11	MAC OS X	Linux	Manual & Info
Visual Radio Control	Visual Radio Control (01-08-2022)				-	-	Manual

After going through the usual installation steps the control software will be installed and can be launched from the desktop icon or shows itself right away on Screen as a replica of the frontpanel of the CamCon.

After installation, you will see in your websbrowser: <http://localhost:8519/>

An image like below picture will now be seen on your screen.



Make sure that your Camcon Device is connected over USB to your PC and that it is turned on.

A blank screen will show when there is no Camcon connection.

You can refresh your screen (F5, or fn+F5 with Windows 11) if there is no picture, or even better close the existing application and re-start the Camcon application.

Your Camcon Device should appear on screen with the `ON` LED (below `STATUS`) turned on green.

REMARK: Camcon Control + VCR open as a program, (don't close them in taskbar)

RENAMING CHANNELS EASILY

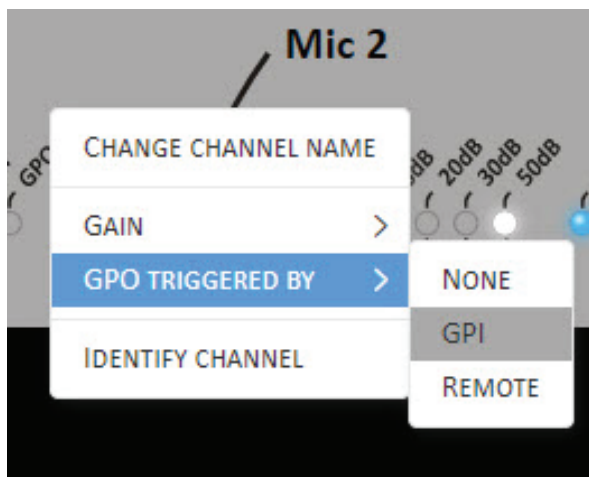
To make the channels easy recognizable in the software later, you can give it names like DJ-1, other than "Ch #1" for instance.

Simply left double-click the Channel name to see a picture as on the right side or right-click on the channel and select `Change channel name` from the menu. Then enter a new name in the Dialog Box and

Camcon Configuration Manager

Enter the new Channel Name:

click `Ok`.



You can also see that there are a number of changes that can be made by right clicking the mouse pointed at the label.

Settings like

- * Gain 0|20|30|50dB (can also be activated directly on the frontpanel)
- * GPO triggered by (None, GPI, Remote)
- * Identify channel(the CamCon leds on the hardware will blink a few times)

IDENTIFYING DEVICE/CHANNELS

When you are not sure your device is connected, or when you have multiple Camcon Devices connected to the PC, you want to make sure that you are working with a specific device.

You can identify the device by either:

- click the `Camcon` word on screen
- click the `D&R` logo
- right-click on the left side of the device and select `Identify` from the menu.

When any of the these actions are performed, the connected hardware Camcon Device should respond by blinking with all of the `Gain` LEDs. When nothing happens, the connection between the PC and the Camcon Device fails.

It is also possible to let just only one channel blink its LEDs by:

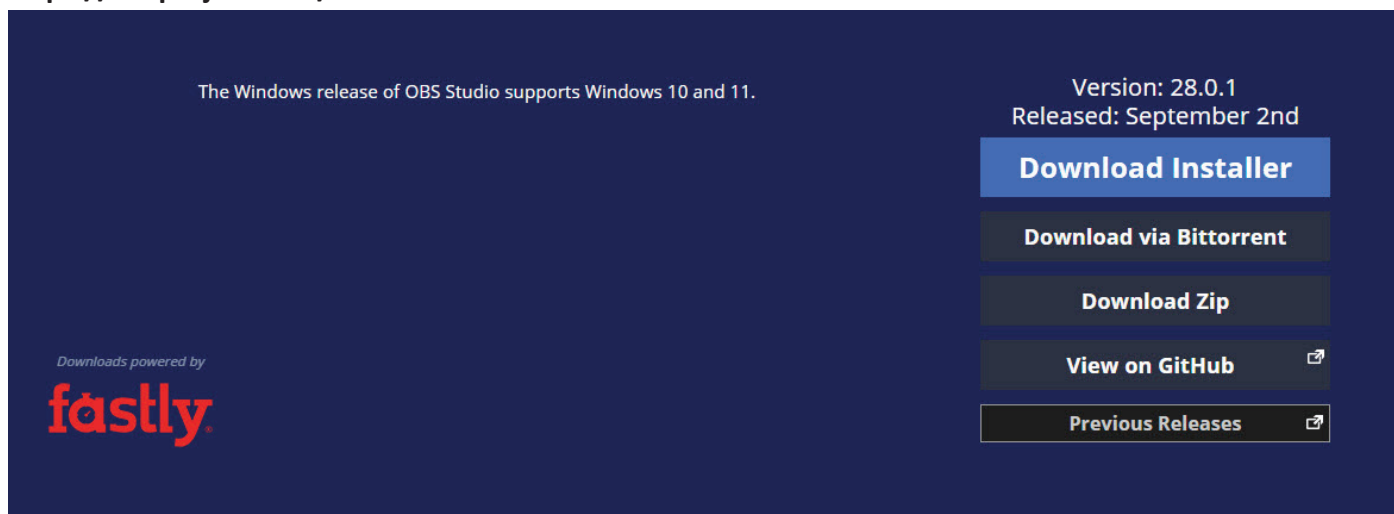
- clicking the separator bar of the channel, or
- right-click on the channel and select `Identify channel` from the menu.

This could be helpful when wiring up the hardware Camcon Device and you want to make sure you have the right channel.

INSTALLING OBS STUDIO version 28 and up

Now it is time to download OBS from this link:

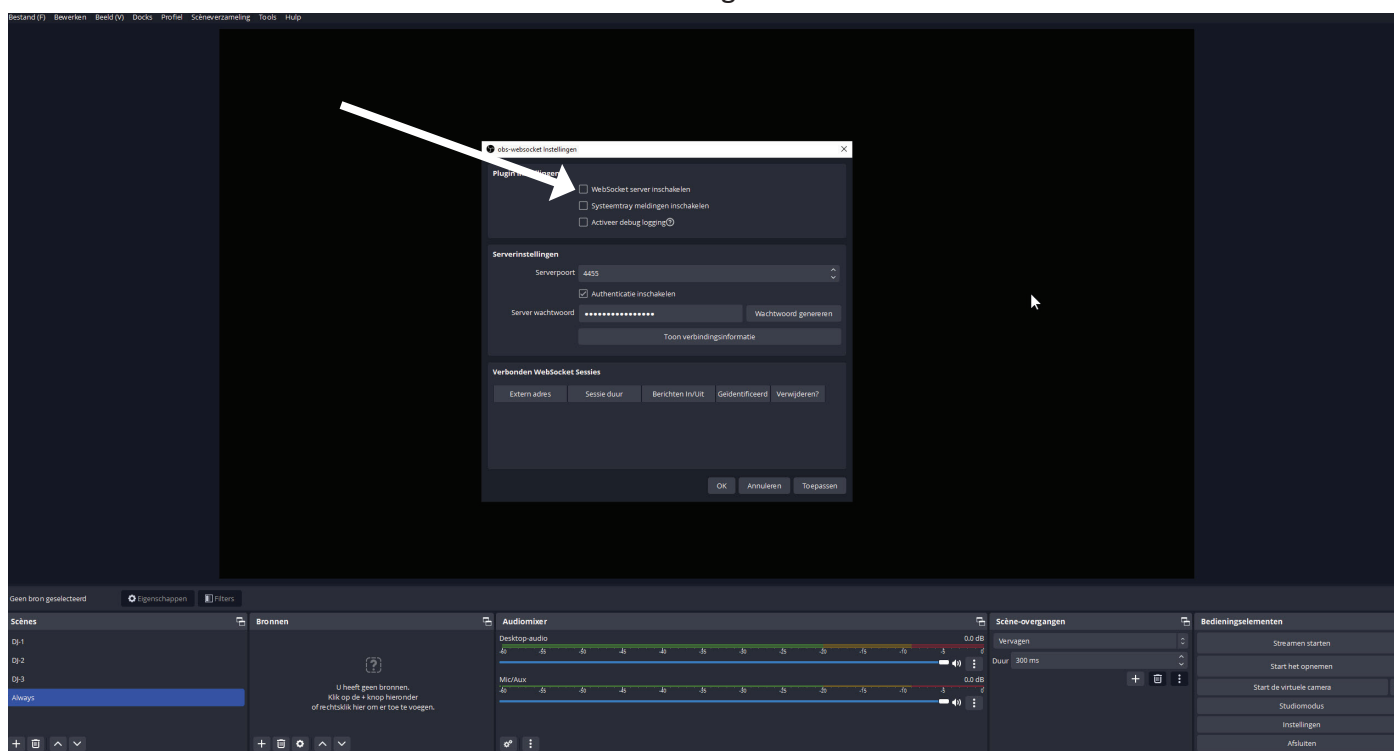
<https://obsproject.com/download>



On the middle-right of the page, click on `Download Installer`.

CONFIGURING THE WEBSOCKET PLUG IN

When the Websocket plugin is properly installed, after (re)starting OBS Studio, it should present itself in the `Tools` menu. Click `Tools` > `OBS-Websocket Settings`. Please make sure that the `Websockets server`



is `Enabled`. (look where the arrow points to) if desired a `Password` can be set to control access to your `OBS Studio`. The password must then also be configured in the VRC settings.

INSTALLING VISUAL RADIO CONTROL

This section describes where you can download _Visual Radio Control_ (VRC) from and what the installation options are. Also the first time the software is used, some initial settings must be checked to ensure proper operation of the software.

Go to www.dnrbroadcast.com website and click on the tab **“Your Support”** and then choose tab **“Service information / FAQ”**

The D&R WIKI page will be shown. Select the Camcon device which brings you to the product page of the CamCon .





Now choose Visual Radio Control where the green arrow below points to, to start your download.

Note: You can ignore pop up screens warning your for malware.

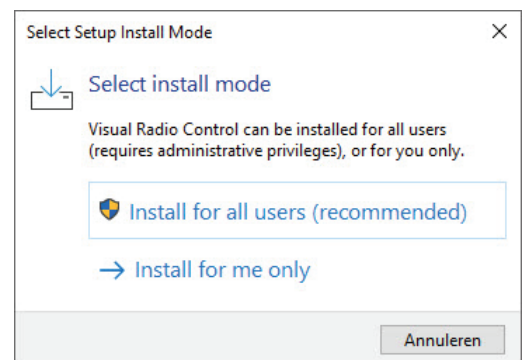
In case you have malware protection that pops up. Choose “more info” and accept/continue.

Visual Radio Control support page

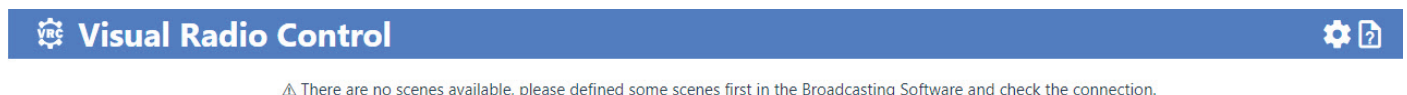
Model:	Production year
Visual Radio Control	2022
Brochure	Manual

Needed Software	Windows 7	Windows 8	Windows 10	Windows 11	MAC OS X	Linux	Manual & Info
Visual Radio Control							Manual
			 v1.1.0 (22-09-2022)		N/A	N/A	Manual

- * Choose Install for all users (recommended)
- * Select Destination Location
- * Select additional Tasks
- * Create a desktop shortcut if you like
- * Then you see Ready to Install, click Install and Finish.



If you have done right you will see below startscreen on your PC.



As you can see the software tells you that there are no scenes in OBS defined yet. But before doing that we will explain some more about the VRC software and how to install your camera's.

CONFIGURE NDI CAMERA

These steps describe the configuration of the MiniPro Video PTZ Camera (model PUS-HD520SEN) connection to OBS via ethernet. This is a tested LAN camera sold by D&R and can be part of the delivery if chosen. Also simple USB camera's will work, but they have a latency problem, when you cannot achieve lipsync images, but for testing this could be used of course.

Configure IP settings (for the " D&R" Camera)

1. The accompanying documentation of the camera indicates which IP number has been configured by the supplier. For instance, 192.168.2.58.
2. Connect the camera to the Ethernet and power supply and connect a PC that has been configured in the same IP range, for instance 192.168.2.22.
3. Open a web browser and go to the IP number of the camera.
4. Login with admin, password admin (unless stated otherwise on the documentation).
5. It now opens the web interface and the camera picture should be shown on the screen.
6. In the menu, you can change the IP address if desired.

Remark: the camera can be set to DHCP (in that case, it will receive an IP address automatically)
In case a connection cannot be established, check the following.

- Open a command screen (in Windows, press start and type 'cmd')
- Type 'ping 192.168.2.58' enter (use the address supplied with the camera) and check if the camera sends a reply. If it doesn't, check all connections or router settings.
- It might be necessary to set the PC ethernet connection to 'Private' (not 'public')
- <https://ndi.video/tools/ndi-core-suite/> offers a free download of the NDI tools to help discovering the camera on the network.

Prepare OBS for NDI

Please follow the instructions below (this is about a different camera model, but the procedure is the same), describing the installation of the NDI plugin for OBS.

Source of next pages are from BZBgear (thank you) and very helpful.

<https://bzbgear.com/knowledge-base/how-to-add-your-ndi-camera-to-obs-studio/>

We will review the process of creating an NDI source in OBS Studio for your BZBGEAR camera.

We will begin this guide under the assumption that you have already established a connection to your camera on your local network. If you have not please refer to this guide

<https://bzbgear.com/knowledge-base/72295/> for Windows,

or this guide

<https://bzbgear.com/knowledge-base/how-to-connect-your-bzbgear-camera-to-the-network-mac/> for Mac.

First you will need to download and install in the following order;

1. **OBS Studio** <https://obsproject.com/download>
2. **NDI Tools**, <https://ndi.video/tools/ndi-core-suite/>
3. **NDI Plugin** for OBS Studio. <https://obsproject.com/forum/resources/obs-ndi-newtek-ndi%E2%84%A2-integration-into-obs-studio.528/>

Be sure to install all components of the NDI Tools package

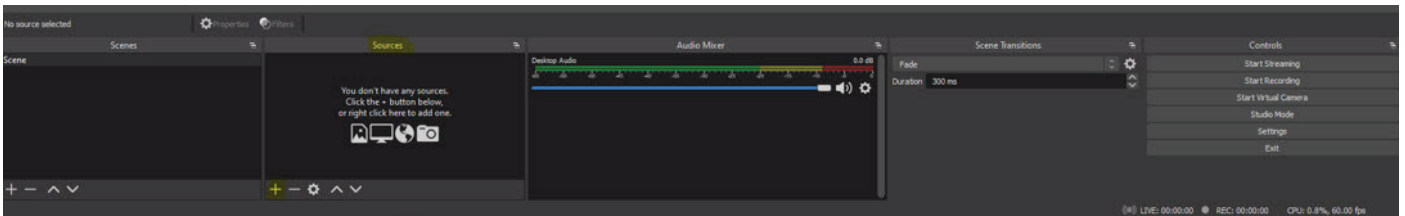
Once everything is downloaded and installed you need to log in to your camera's web browser interface to enable the NDI stream.

Navigate to **Configuration** -> **NDI** and check the box for **NDI Enable**.

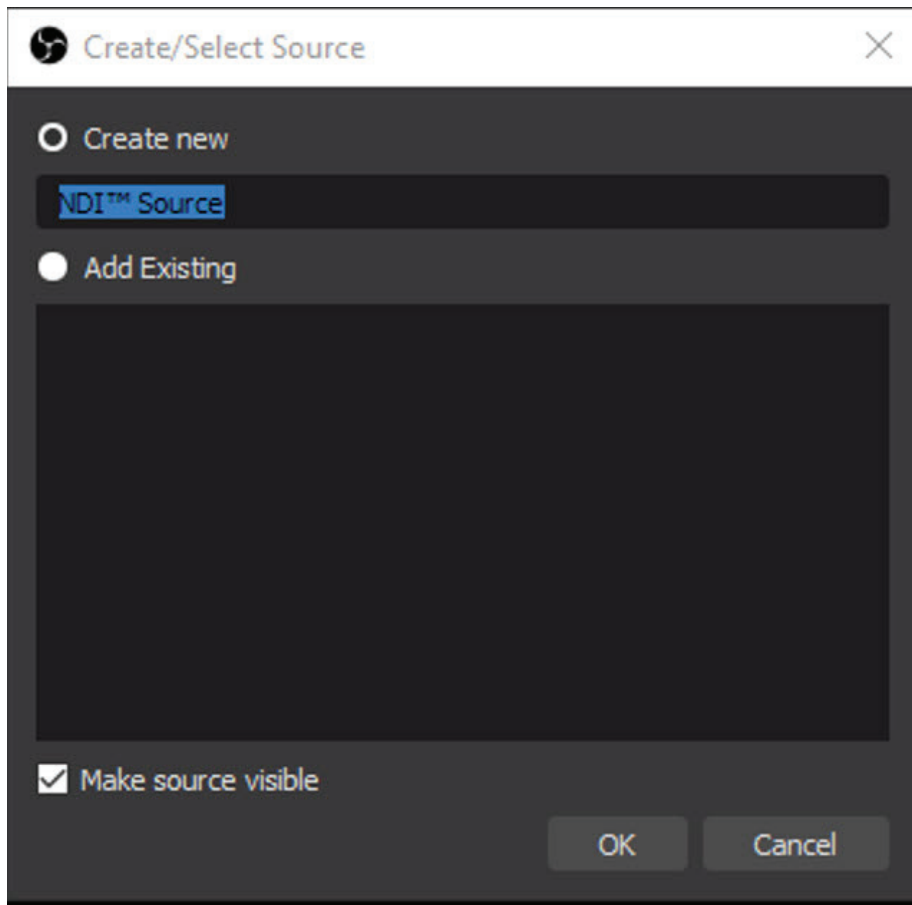
Choose a NDI Name that will be easily recognizable and set your NDI Group, if desired.

Click **Save** and reboot the camera. ***The camera MUST be rebooted for these settings to apply!***

Open OBS Studio. Click + to add a new source in the Sources window.

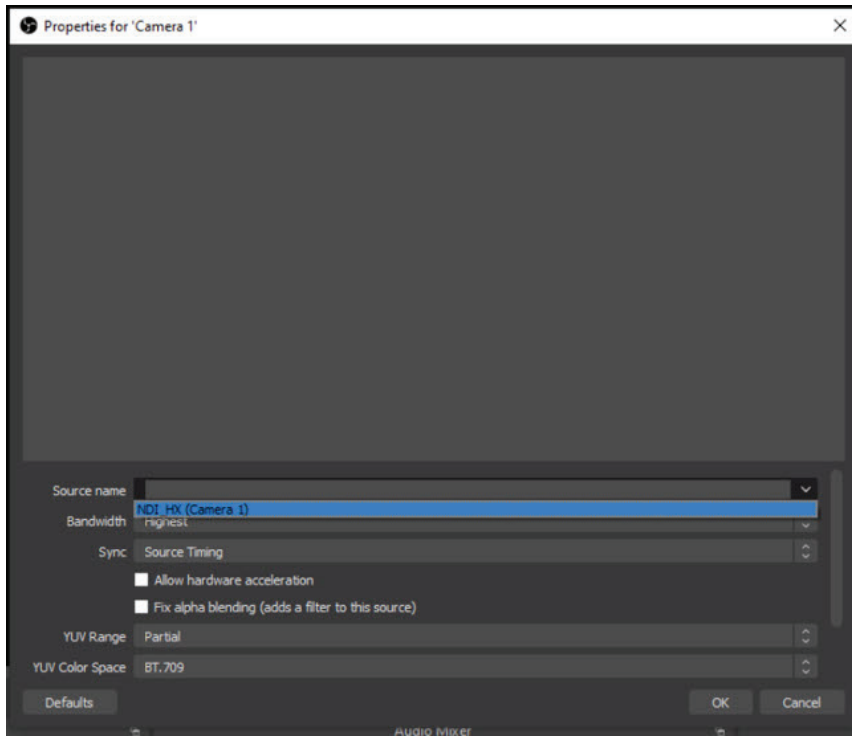


Name your NDI source , make sure the “Make source visible box is checked and click OK.

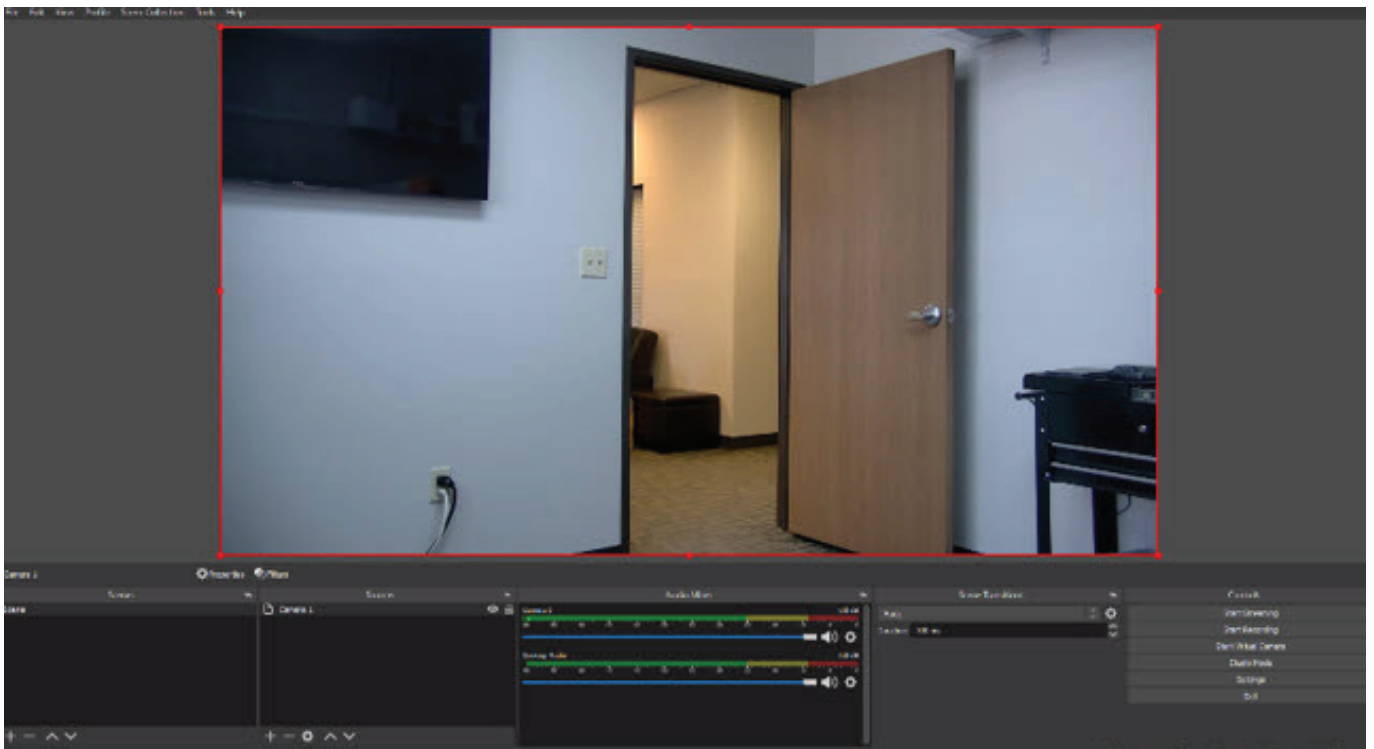


When the Properties screen appears select the pull-down menu for Source name and select your NDI camera.

The name should appear as NDI_HX (Your camera name). Click **OK** to close the Properties.



Highlight your camera in the sources window and your NDI feed should appear.



1.3. Using it for the first time

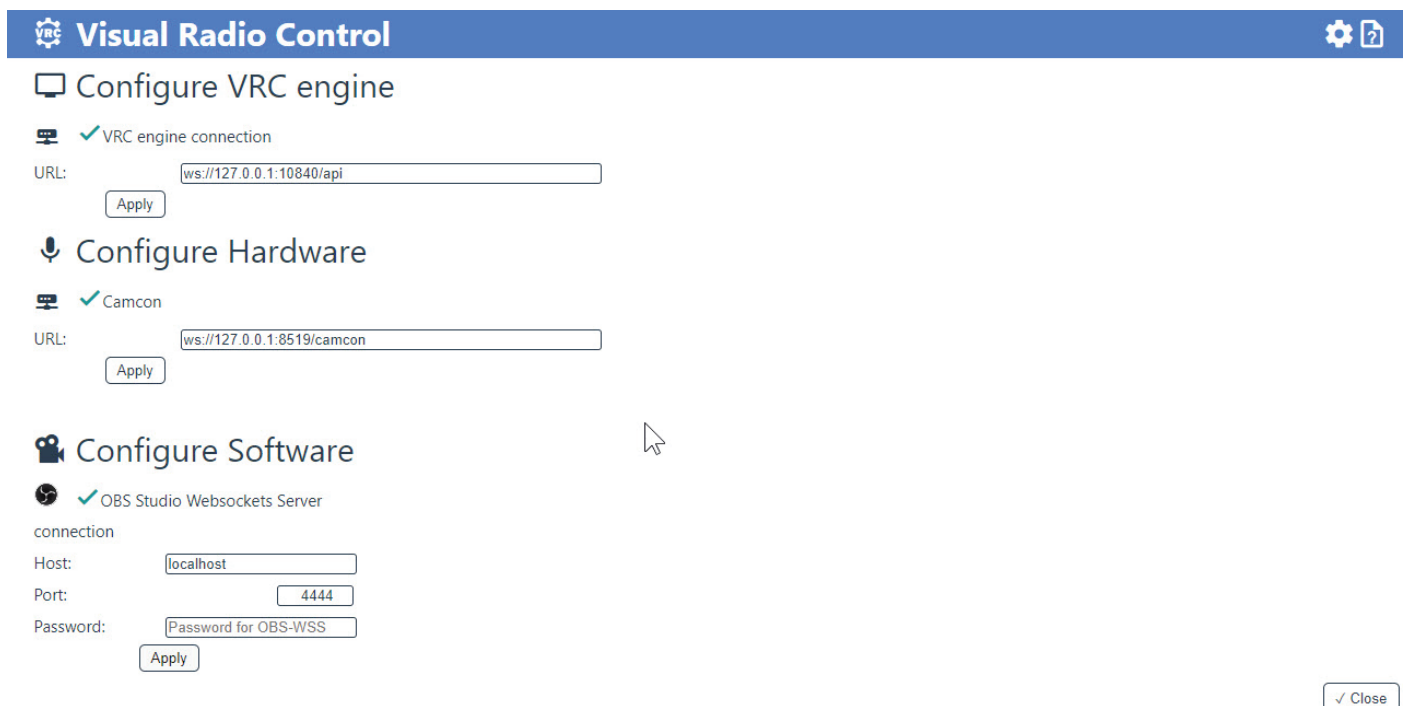
By default the software is configured and all other software is installed on the PC. It is however quite possible to have different parts of the whole switching system running on different PCs. Or just configure the `_Visual Radio Control engine_` from a mobile device.

To check if the current configuration is working, let's start with Visual Radio Control. Make sure that **CAMCON CONTROL** and **OBS Studio** is already running.

Click on the 'Cogwheel' icon labelled 'Configuration'.

Below screen will be shown. Check if the CamCon unit is connected and switched on then start

1. Camcon application
2. Start OBS
3. Start VRC

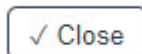


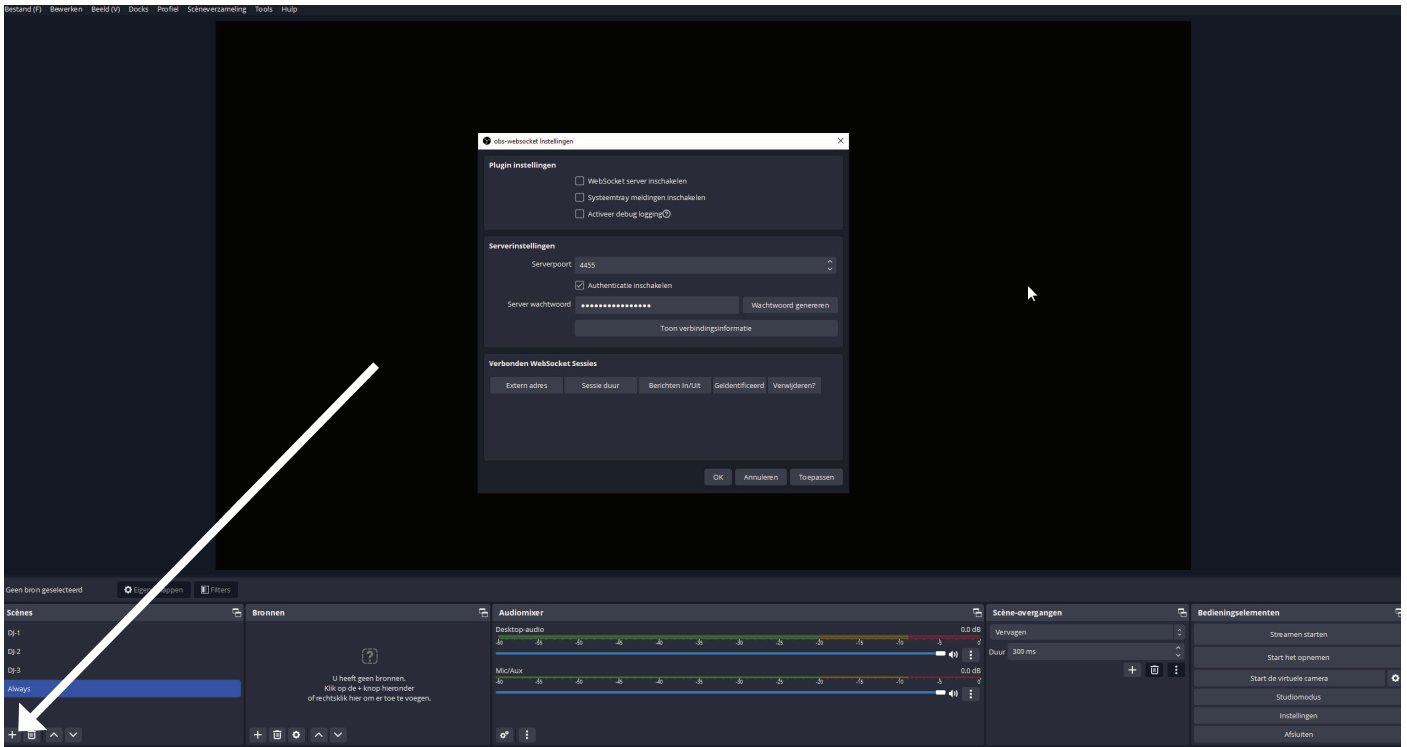
You are now presented with a list of connections that are made by VRC. The first connection is that of the Web browser (VRC engine connection) The second connection is to the CamCon hardware. The Third connection is to the OBS software. (OBS Studio Websockets Server)

When you are using a PC where all this software is installed on, this should show a green 'check-mark' indicating that there is a live connection.

If not go to the "Trouble Shooting Section" of try F5 to refresh all the connections.

Now close this screen by hitting the Close button





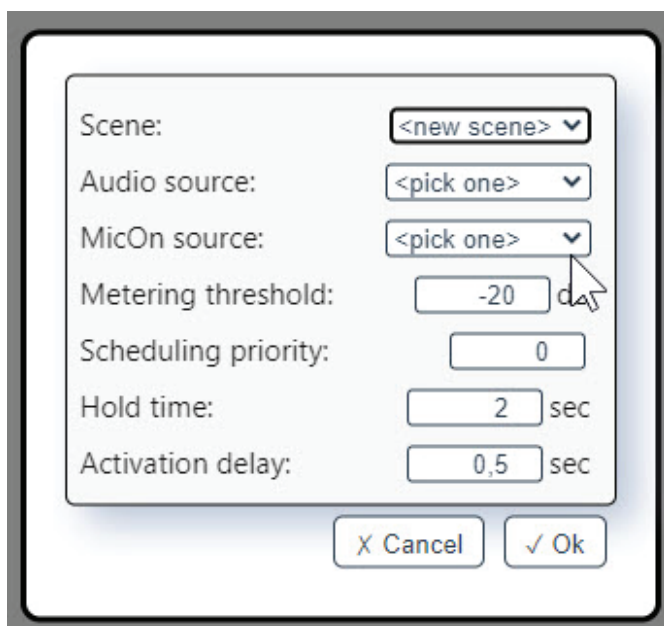
A quick glance

What is inside this software, let's go through the menus.

The manual of OBS (freeware) has to be downloaded to get more understanding how it works.

Here is a simple start, go to the main screen of OBS and create a scene where the white arrow points to and give it a name.

Now go back to the VRC software screen and hit the “+ Add scene” button.



The menu on the left will be shown

Under the scenes menu is the main action of the VRC software.

Here the scenes from the Broadcasting software will be connected to audio sources, so the VRC software will know which scene to activate when an audio source becomes active.

Also other parameters can be set to influence the director's decisions.

The VRC software will also indicate which scene is currently active.

This will continuously be updated from the VRC software.

When a scene is active in the VRC software that is not under control of the Visual Radio Control, then no

scene in the users interface will appear to be active.

Configuration menu

The configuration menu holds the hard- and software connection configuration information to the outside world. Here the connection information to the VRC software and monitoring hardware need to be entered. Please refer to the documentation of the respective hard- and software for the connection details.

Please do note that this information is sent to the engine, so all connection information must be relative to this engine. This is only important when you use the term `localhost`, which refers to the local PC, relative to the engine. **Below is a practical filled in set up for one mic (scene 1) and an overview camera (scene 2)**

The image shows a screenshot of the Visual Radio Control (VRC) configuration menu. At the top, there is a blue header with the VRC logo and the text "Visual Radio Control". Below the header, there are two panels representing different scenes. The left panel is titled "Scene 1" and the right panel is titled "Scene 2". Each panel contains several configuration options with input fields and dropdown menus. Below each panel is a "Delete" button.

Scene 1	Scene 2
Audio source: Mic 1	Audio source: Always active
MicOn source: Mic 1	MicOn source: Always on
Metering threshold: -20 dB	Metering threshold: -20 dB
Scheduling priority: 1	Scheduling priority: 10
Hold time: 1 sec	Hold time: 3 sec
Activation delay: 0,3 sec	Activation delay: 0,3 sec

Scene:

If you click on the <new scene> button you will see the scene with the label you have made in OBS, choose that label to control that scene.

Audio (metering) source: (this shows the scenes created in OBS)

If you click on the Audio source label which says <pick one> you can select one out of the created scenes in OBS. The audio and MicOn sources will be retrieved from the connected hardware.

Based on this information, the software can decide if there is activity on a channel (someone is talking) and this channel (and corresponding scene) should be considered to be activated (e.g. receives the focus).

The metering information is not the only parameter that is considered in this decision. It might even be completely ignored. The channel also has a `MicOn source`, which must be active before the metering information is even monitored.

MicOn source:

If you click on the MicOn source label drop down menu you can select one out of the sources in OBS to control the scene.

A `mic on source` is usually the combination of a mixer channel that is turned `On` and the fader of that channel set to anything other than minus infinity.

In some cases, for instance when using a Camcon Device, this could be the `GPI` signal on the channel that is also used as `Audio source`.

In such case the audio mixer device will generate the appropriate Mic-on signal and should be physically connected to the Camcon Devices' GPI input port.

The `MicOn source` *must* be active before a scene's `Audio source` is monitored and considered to have its scene be activated. + if no connection to "Fader on" of the mixer to GPI is made, select always on.

Metering threshold

When a `Mic on` is active and metering information is available on the `audio source`, the threshold level comes into play.

The metering level (ranging from -50dB to +5dB) must be above the level that is indicated here.

Do note that this is a metered level and the channel's `Gain` settings do apply to these measured values.

Scheduling priority

When two or more sources are active and have metering levels above their threshold (two or more speakers interrupting each other), the `Scheduling priority` helps deciding who will actually receive the focus. A higher value for the priority means that it will be more likely to be picked.

When two, or more, sources are active and have equal priorities, the first scene as it is configured and appears in the list will be activated. The range can be set between 1 (highest priority) and 10 (lowest priority)

2.1.2.6. Hold time

To prevent flickering and too frequent scene switching, a hold time can be set between zero and 10 Sec.

This holds the scene active for at least the given time, even if the metering level drops below its threshold or even if the `mic on` gets deactivated within that time.

Note, that choosing longer hold times, some side effects might occur.

For instance, when the `hold time` is long enough, an other channel can become active and inactive during the hold time of this channel and therefore the other channel's scene will not receive the focus.

Activation delay

It can be useful to wait to activate a scene, even though the channel is active.

This can have various reasons, like coughing or enthusiastic agreeing noises. and to suppress spurious activation of the scenendue to coughs etc. Or maybe even intermittent noise static or occasional plugging-in sound plops. For this an `activation delay` can be set.

This results into a period of time that a channel needs to be active before its scene gets the focus.

Do note that the `activation delay` time and the `hold time` can run concurrent.

This means that a channel's `activation delay` time can already have passed, while the current scene's `hold time` is still preventing the actual activation of the scene.

Note: When creating new scenes in the VRC software you sometimes need to refresh the connection by hitting F5 and get the latest data from OBS.

Modifying scenes

Go to edit mode by clicking the `Edit scenes` button.

In the edit mode, each configured scene can be changed on all its properties except for the scene it is attached to. When you want to change the scene for the given sources, you will have to remove this configuration to free up the sources and create a new scene.

Removing scenes

Go to edit mode by clicking the `Edit scenes` button.

In the edit mode, under each configured scene, a `Delete` button will appear.

Be careful, clicking the `Delete` button will remove the configured scene, immediately and without undoing this action.

Let the `_Visual Radio Control_` direct

When done, click the `Edit scenes` button. All configured scenes are now under control of the `_engine_` and will automatically be activated in the broadcasting software.

DJ-1

Audio source:

MicOn source:

Metering threshold: dB

Scheduling priority:

Hold time: sec

Activation delay: sec

DJ-2

Audio source:

MicOn source:

Metering threshold: dB

Scheduling priority:

Hold time: sec

Activation delay: sec

DJ-3

Audio source:

MicOn source:

Metering threshold: dB

Scheduling priority:

Hold time: sec

Activation delay: sec

Always

Audio source:

MicOn source:

Metering threshold: dB

Scheduling priority:

Hold time: sec

Activation delay: sec

A set up with 4 camera's can look like the settings shown above.

GOOD TO KNOW, TIPS and Hints

- The `_Visual Radio Control engine_` can and will do its thing in the background. It does not need a web browser to be opened.
- As long as there are configured scenes available, the `_engine_` will try and direct your configured broadcasting software.
- However the `_engine_` will connect and update the web browser `_UI_` when it is open (or actually the other way around).
- So it will be possible to monitor the `_engine_` from the browser and even influence it.
- It is possible to bypass all algorithms and activate a (configured) scene by hand, simply by clicking on it. You will see that the scene that currently has the focus, will have a different recording indicator in front of the scene's name and that it will have a colored band as well. Clicking a different scene, will eventually lead to receiving the focus, as it will be visible by the recording indicators.
- Please do note that closing the web browser **will not** stop the `_engine_`. As indicated before, the `_engine_` holds the connections to both hard- and software. The `_engine_` will continue to try and direct the broadcasting software. The `_engine_` must be stopped separately to prevent further (unwanted) scene switching.
- When some devices or software are running on other PCs, this will become more of a hassle. In that case, make sure that you enter the correct hostnames or ip-addresses of the individual PCs. Followed by clicking the `Apply` button directly underneath the field that was changed. Then every connection box should end up with a green checkbox next to it. When you have this, you're good to go.
- When you are using a PC where all this software is installed on, this should show a green 'check-mark' indicating that there is a live connection. If not try F5 to refresh all the connections
- When you are using an other PC or a mobile device and pointed the web browser to the actual PC, you will most likely have a yellow-ish round pointing arrow figure. This indicates that there is no active connection, but the software is trying. In this case change the contents of the `URL` field from `ws://127.0.0.1:10840` into `ws://<ip-address-of-pc>:10840` Then click the `Apply` button directly underneath this box. This should establish the connection. Then the other connection boxes become relevant. The connection information in these boxes are seen from the `_engine_` perspective. When everything is installed on a single PC, there will be no problems and all connections can lead to "localhost"

Scene properties

Lets explain the properties that can be configured and how they might affect the `_Visual Radio Control_` software.

Scene name

The list of scene names is retrieved from the VRC software automatically.

When the VCR software is properly configured. This list should be the same as in OBS your broadcasting software. From this list, you can select the scene that you want to have the `_Visual Radio Control_` software under its control. In order to have proper control, also the `Audio source` and the `MicOn source` must be assigned.

Audio source

The audio source will provide metering information to the `_Visual Radio Control_`.

Based on this information, the software can decide if there is activity on a channel (someone is talking) and this channel (and corresponding scene) should be considered to be activated (e.g. receive the focus).

The metering information is not the only parameter that is considered in this decision.

It might even be completely ignored.

The channel also has a `MicOn source`, which must be active before the metering information is even monitored.

MicOn source

A `mic on source` is usually the combination of a mixer channel that is turned `On` and the fader of that channel set to anything other than minus infinity.

In some cases, for instance when using a Camcon Device, this could be the `GPI` signal on the channel that is also used as `Audio source`.

In such case the audio mixer device will generate the appropriate Mic-on signal and should be physically connected to the Camcon Devices' GPI input port.

The `MicOn source` *must* be active before a scene's `Audio source` is monitored and considered to have its scene be activated.

NOTE:

In case there is no GPO signal available from your mixer, just patch the GPI to the same channel's GPO and activate the GPO output in the 'Camcon Configuration Manager' to "solve" this problem.

Or Choose "always" on as mic on source.

The disadvantage is that scenes are switched by mic signals only even when a fader is down (this fader down information lacks now for the Camcon to repond properly).

3. Troubleshooting

3.0.

In case you still have OBS version 27 the D&R VRC software will not work. You have to download version 28 or a later version, see links below.

<https://obsproject.com/download>

3.1. USB Device not recognized, refresh with F5 or unplug and replug the USB cable.

3.1. Cannot connect, check your USB cable and refresh with F5

3.2 “Windows Defender” reports virus during/after upgrading. Uninstall software and install, rather than upgrade.

Download and install the software from:

<<http://www.mambanet.org/wiki/dokuwiki/doku.php?id=XXX>>

After installation, point your web browser to: <<http://localhost:8519/>>

This exact image will shortly be replaced with the actual Camcon information as it is attached to your computer, or a blank screen when there is no Camcon connection.

Make sure that your Camcon Device is connected over USB to your PC and that it is turned on. Your Camcon Device should appear on the screen with the `ON` LED (under `Status`) turned on green.

DIMENSIONS Camcon frame

Front Left-Right	: 482 mm
Frame left right	: 430mm
Front-Back	: 175 mm
Height	: 44 mm. (1HE)
Front panel thickness	: 2 mm
Radius Corners	: 20 mm
Weight	: 5 kg.

We wish you many creative years of productivity using this quality product from:

Company	: D&R Electronica B.V.
Address	: Rijnkade 15B
Zip Code	: 1382 GS
City	: WEESP
Country	: Netherlands
Phone	: 0031 (0)294-418 014
Website	: https://www.dnrbroadcast.com
E-mail	: sales@d-r.nl

SUMMERY

We hope this manual has given you sufficient information to use this new CamCon triggerunit in your studio.

If you require more info please contact your local dealer or send us an email at support@d-r.nl and we will answer your email within 24 hours during weekdays.

In case you have bought this unit from a previous owner, check out the dealer in your area on our website www.dnrbroadcast.com in case you need assistance.



ELECTROMAGNETIC COMPATIBILITY

This unit conforms to the Product Specifications noted on the Declaration of Conformity.

Operation is subject to the following two conditions:

This device may not cause harmful interference

This device must accept any interference received, including interference that may cause undesired operation

Operation of this unit within significant electromagnetic fields should be avoided

Use only shielded interconnecting cables.

DECLARATION OF CONFORMITY

Name Manufacturer : D&R Electronica b.v.
Address manufacturer : Rijnkade 15B,
: 1382 GS Weesp,
: The Netherlands

declares that this product

Name product : AIRLITE
Model number : n.a.
Product options installed : none

passed the following product specifications:

Safety : IEC 60065 (7th ed. 2001)

EMC : EN 55013 (2001+A1)
: EN 55020 (1998)

Supplementary Information:

The product passed the specifications of the following regulations;

: Low voltage 72 / 23 / EEC
: EMC-Directive 89 / 336 / EEC. as amended by Directive 93/68/EEC

(*) The product is tested in a normal user environment.

PRODUCT SAFETY

This product is manufactured with the highest standards and is double checked in our quality control department for reliability in the "HIGH VOLTAGE" section.

CAUTION

Never remove any panels, or open this equipment. No user serviceable parts inside. Equipment power supply must be grounded at all times. Only use this product as described in the user manual or brochure. Do not operate this equipment in high humidity or expose it to water or other liquids. Check the AC power supply cable to assure secure contact. Have your equipment checked yearly by a qualified dealer service center. Hazardous electrical shock can be avoided by carefully following the above rules.

Ground all equipment using the ground pin in the AC power supply cable. Never remove this pin. Ground loops should be eliminated only by use of isolation transformers for all inputs and outputs. Replace any blown fuse with the same type and rating only after equipment has been disconnected from AC power. If problem persists, return equipment to qualified service technician. Always earth all your equipment by the grounding pin in your mains plug. Hum loops should be only cured by proper wiring and isolation input/output transformers. Replace fuses always with the same type and rating after the equipment has been turned off and unplugged. If the fuse blows again you have an equipment failure, do not use it again and return it to your dealer for repair.

Always keep the above information in mind when using electrically powered equipment.