Wallbox Q-Down

Dual channel broadcast down converter and DA in a wallbox

Crystal Vision

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1 Introduction

Wallbox Q-Down is a dual channel, short processing delay down converter with both SDI and analogue outputs and with integrated fibre video inputs.

Wallbox Q-Down can down convert 1080p 3Gb/s, 720p HD and 1080i HD at both 50Hz and 59.94Hz, with the down converter bypassed if the input is Standard Definition. **Wallbox Q-Down** offers flexible outputs, providing two input loop-throughs and two digital and one composite video down converted outputs per channel. 1080p, 720p and 1080i video can be converted to 625i or 525i digital and analogue.

Using Crystal Vision's proprietary processing, **Wallbox Q-Down** provides a unique level of image quality – avoiding aliasing while retaining picture sharpness. The sophisticated two-dimensional filtering gives broadcast results without the complication of looking at multiple fields or movement detection – resulting in reliable, artefact-free conversion. Four vertical filter characteristics can additionally be used to optimise the performance for the material.

A short processing delay of just 16 lines eliminates the need to compensate audio or other signals for the video delay, keeping everything in sync and making the system design much simpler. There is also a fixed one frame delay and a user adjustable delay which sets the delay in pixels and lines to one frame of delay. With the one frame fixed delay set, the adjustable delay will allow delay setting of one frame plus one frame or minus one frame less 16 lines. This 16-line limit is imposed to prevent possible frame tearing at delays less than 16 lines.

Wallbox Q-Down has the ability to deal with any 3Gb/s or HD to SD aspect ratio conversion requirements, with the option of selecting a 16:9 Anamorphic output for 16:9 SD systems and either a 16:9 to 4:3 Letterbox or 16:9 to 4:3 Full Screen with centre cut for 4:3 SD systems. With **Wallbox Q-Down** it is also possible to select the output aspect ratio according to the SMPTE 2016 AFD data embedded in the 3Gb/s or HD input video, and to insert WSS into the SD output, either manually or by automatically following the incoming AFD. Output picture position is fully adjustable with the ability to crop all four sides of the picture individually.

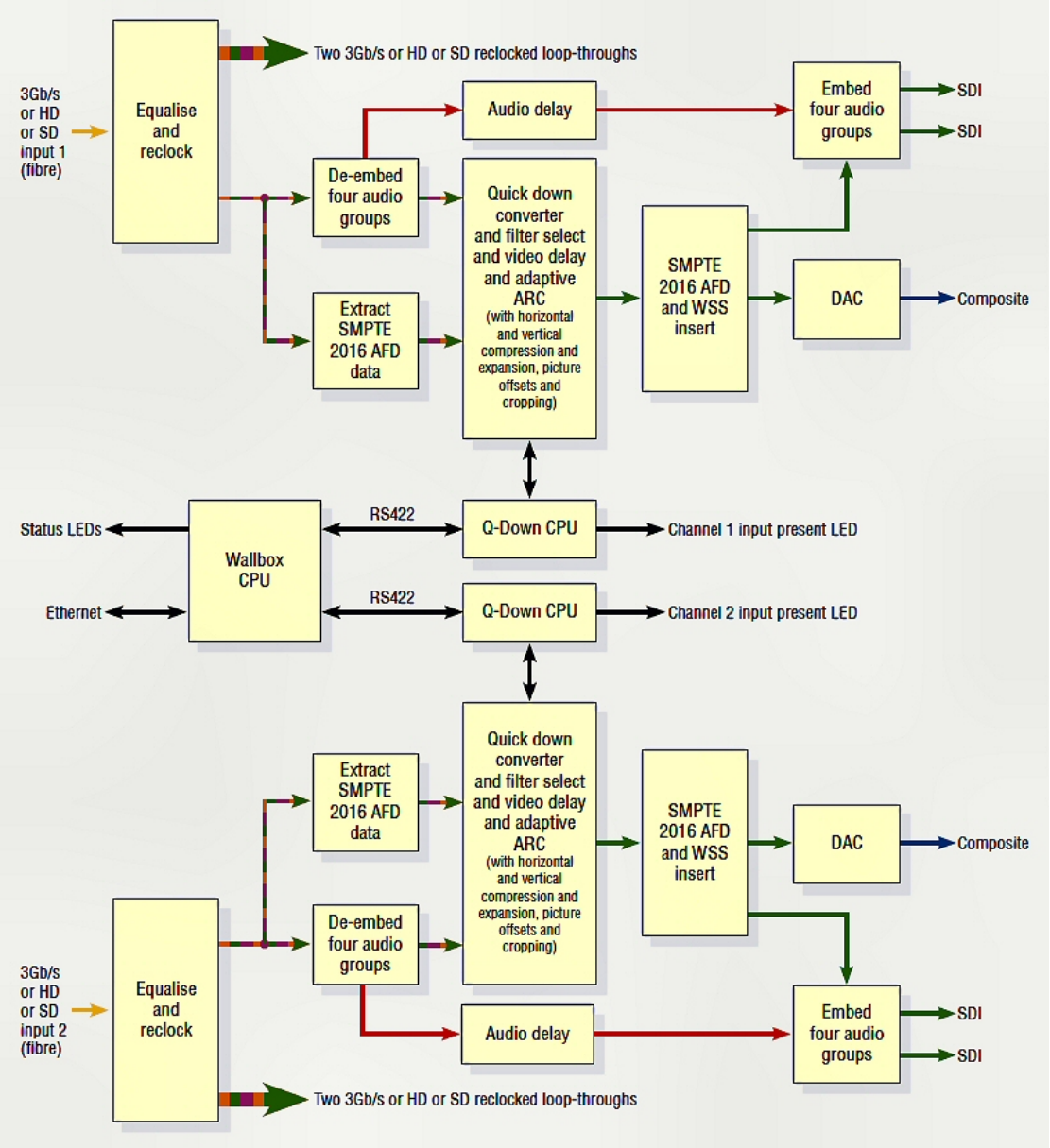
Wallbox Q-Down is ideal as the main signal path down converter for those working with embedded audio. It can pass four groups of embedded audio, de-embedding the four groups and converting them to the appropriate format before re-embedding them. Also included is signal probe functionality, making it useful for flagging up faulty signals, especially in multi-channel applications. Amongst the status indications available are – input video not present, video frozen, video black and both audio not present and audio silent on all four groups.

Wallbox Q-Down is a space-saving 1U high, 200mm deep, 19" rack mounting chassis with the video output BNC connectors conveniently mounted on the front panel.

Wallbox Q-Down inputs are fibre optic and accessible via by the rear mounted dual LC connector. Video outputs are accessible via the front panel mounted BNC connectors.

Remote control via Ethernet is with the VisionWeb web browser interface, SNMP and VisionPanel remote control panel.

Wallbox Q-Down is ideal for use in mixed 3Gb/s, HD and SD environments, or for any areas being converted to HD or 3G.



Wallbox Q-Down functional block diagram

The main features for **Wallbox Q-Down** are as follows:

- Dual channel broadcast down converter and distribution amplifier.
- Two independent 3Gb/s, HD or SD fibre inputs.
- Provides easily accessible down converted signals and input loop-through on the front panel.
- Five outputs per channel: two input loop-through, two down converted SDI digital outputs and one down converted PAL/NTSC analogue output.
- Excellent image quality, thanks to sophisticated two dimensional filtering, four vertical filter characteristics and video proc-amp.

- Short processing delay (just 16 or 52 SD lines).
- Passes four groups of embedded audio.
- Flexible aspect ratio conversion, including custom aspect ratios and AFD insertion and reading.
- Match other delays in system with two fixed delay settings plus variable video delay.
- Flag up faulty video and audio signals with signal probe.
- Flexible remote control, including web browser, remote control panel and SNMP.

2 Installation

2.1 General Safety Summary

The following warnings are intended for user guidance and safety.

Ground

This product must be grounded through the grounding conductor of the power cord.

Power cable

Use only a power cord that meets the required specification for this product.

Fuses

To avoid fire hazard use only fuses of the type and rating specified.

Service

These servicing instructions are for use by qualified personnel only. To reduce risk of electric shock, do not perform any servicing other than that contained in this manual unless you are qualified to do so. Refer all servicing to qualified service personnel.

Apart from procedures described in this manual there are no user serviceable parts within the frame. If the frame requires any other servicing it should be returned to the manufacturer or dealer.

On no account should the unit be powered whilst any covers are removed.

Ventilation

The unit must have adequate ventilation. The left and right ventilation grilles must not be obstructed. If installed in a standard 19" rack, cool air circulation should be available.

EMC

To comply with EMC regulations, the following guide lines should be observed:

Do not operate this unit for extended periods with the front panel open.

Do not operate the equipment with covers or panels removed.

General

To avoid electric shock do not operate this product in wet or damp conditions.

To avoid injury or fire hazard do not operate this product in an explosive atmosphere.

Only use this rack in conjunction with Crystal Vision modules designed for that purpose.

The **Wallbox Q-Down** houses the Crystal Vision range of optical modules. Although these modules are not capable of causing personal injury, care should be exercised when exposing unshielded optical signals not to look directly into the light beam.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

2.2 Rack mounting and ventilation

The **Wallbox Q-Down** unit must have adequate ventilation. On no account should the ventilation grilles be blocked and cool air circulation must be available.

Wallbox Q-Down air-flow

Install the **Wallbox Q-Down** in a standard 19" rack as follows:

- Mount in the rack and secure via the rack ears

2.3 Connecting mains cables

The wallbox is powered by connecting a power cord to the IEC connector on the rear panel.

Ensure that the power cord has a minimum current rating of 6A fitted with an IEC 320 female connector, includes a protective ground connection and meets relevant local safety standards.

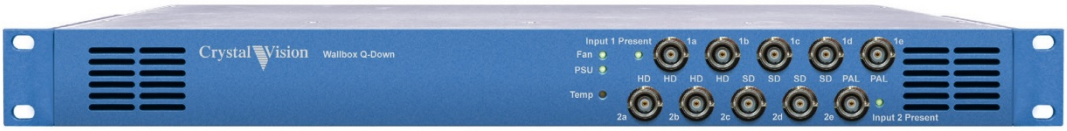
Note: The fuse holder is part of the mains inlet. The mains cable must be disconnected before the fuse can be accessed. Replace the fuse only with one of the same type and rating. Refer to the maintenance section of the troubleshooting guide for more information.

3 Wallbox connections

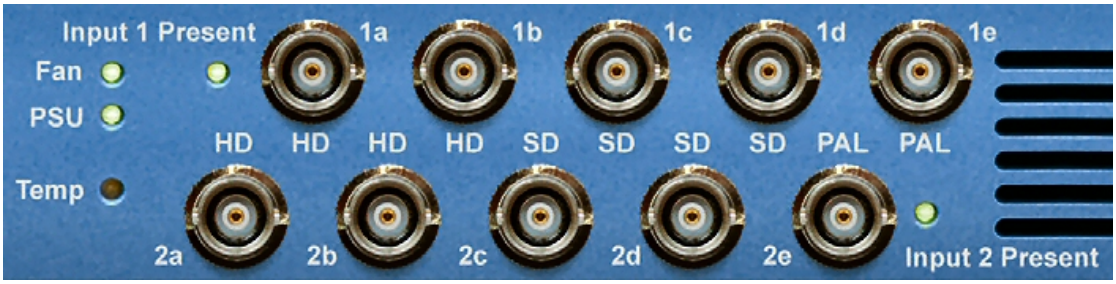
Each channel of the **Wallbox Q-Down** has a single 3G, HD or SD fibre video input and five outputs. Two of the outputs are equalised and reclocked loop-throughs of the fibre inputs, the others are two down converted SDI digital outputs and one down converted PAL/NTSC analogue composite video output.

3.1 Front panel

Video outputs are via the front panel mounted BNC connectors:



Wallbox Q-Down front panel

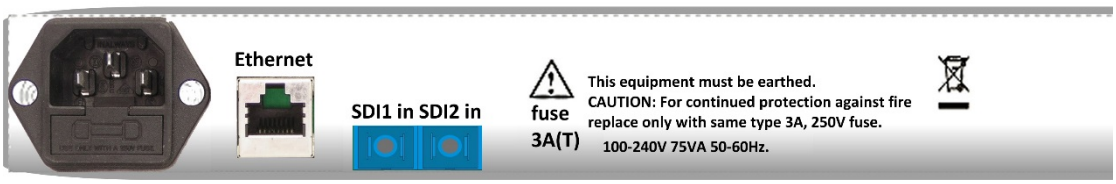


Close-up of front panel connectors

BNC	I/O function
1a	3G/HD/SD equalised and reclocked loop-through output of video input 1.
1b	3G/HD/SD equalised and reclocked loop-through output of video input 1.
1c	Down converted SD serial digital output derived from input 1.
1d	Down converted SD serial digital output derived from input 1.
1e	Down converted composite video output derived from input 1.
2a	3G/HD/SD equalised and reclocked loop-through output of video input 2.
2b	3G/HD/SD equalised and reclocked loop-through output of video input 2.
2c	Down converted SD serial digital output derived from input 2.
2d	Down converted SD serial digital output derived from input 2.
2e	Down converted composite video output derived from input 2.

3.2 Rear panel

The IEC mains, two fibre video inputs and the Ethernet connectors are mounted on the rear panel:



Wallbox Q-Down rear panel connectors

Connector	Function
Ethernet	10/100 Ethernet remote control link.
SDI1 in	3Gb/s, HD or SD fibre video input channel 1.
SDI2 in	3Gb/s, HD or SD fibre video input channel 2.

3.3 Connector pinouts

RJ45 Ethernet connector

Pin number	Function
1	TD+
2	TD-
3	RD+
4 and 5	Not used – 75 ohm resistor to GND in frame
6	RD-
7 and 8	Not used – 75 ohm resistor to GND in frame

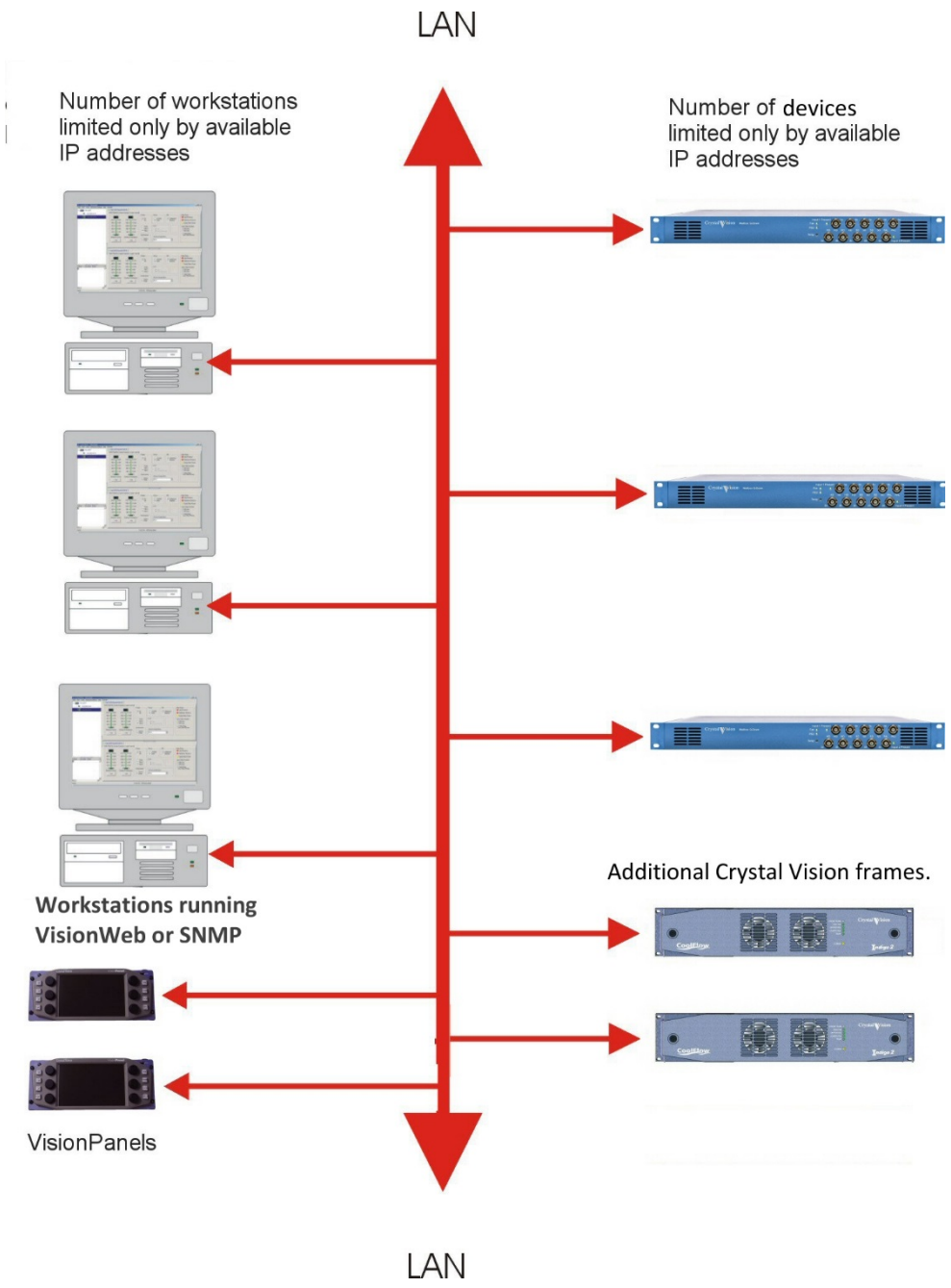
3.4 Front panel LEDs

The following table summarises the front panel LED functions and colours:

Name	LED Colour	Function
PSU	Green	Good power supply (PSU) rails.
	Red	The power supply voltage is out of specification. Replace immediately.
Fan	Green	Normal operation.
	Red	Fan speed low, replace immediately.
Temp	Green	Normal operation.
	Red	Wallbox overheating! Check that fan inlet and outlets are not blocked.
Input Present	Green	Valid signal detected at the fibre video input.
	Off	No input signal detected.

4 Remote control via Ethernet

Wallbox Q-Down is fitted with an Ethernet interface which enables remote control by VisionWeb, VisionPanel and SNMP. Multiple **Wallbox Q-Down** units can be controlled over a local area network. Other Crystal Vision frames can be connected to the same network.



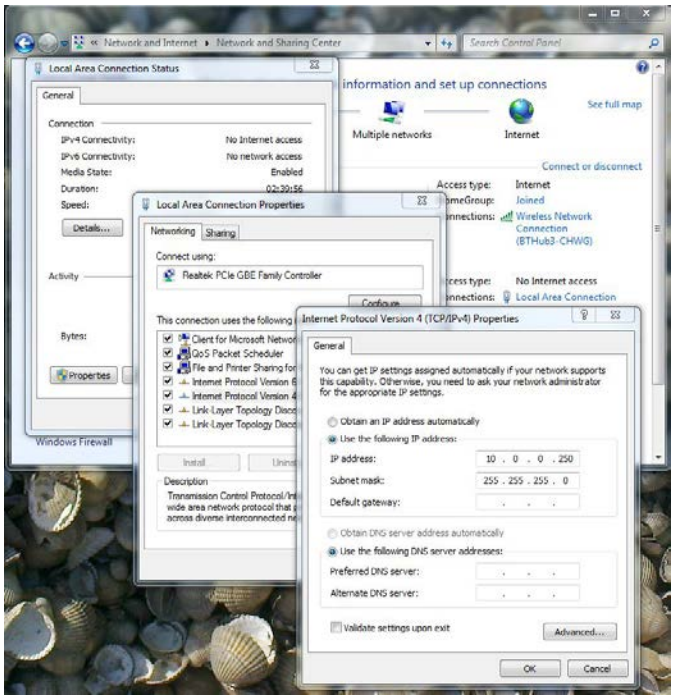
Remote control of Wallbox Q-Down over the Ethernet

4.1 IP address

Wallbox Q-Down is shipped with the default IP address of 10.0.0.201 and once communication has been established, this IP address can be changed to another.

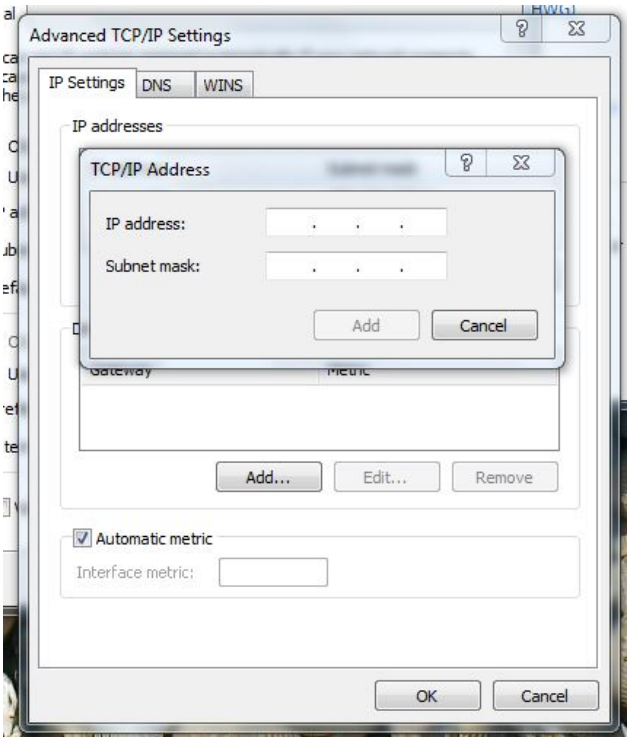
4.2 Connecting a PC

Set the PC's Local Area Connection (LAN) controller's sub-mask to 255.255.255.0 and the IP address within the same IP group i.e. 10.0.0.250. For Windows users this is most easily accessed from the Network and Sharing Centre:



Setting up the PC's LAN controller with Windows 7

It is worth noting here that Windows does allow LAN controllers to operate with several IP addresses and sub-masks simultaneously, which can be useful if a number of frames need to be set up. Once a frame is programmed with its final IP address it may be that the PC will no longer be able to control the frame without changing its LAN controller's IP address. In this case setting an additional IP address could save time if a large number of frames are to be configured. Additional IP addresses can be added via the 'Advanced' tab in Windows 7:



Windows 7 Advanced LAN settings

Alternatively, the LAN controller sub-mask can be extended to allow control of frames of similar IP address. For instance, if a frame is to be finally configured as 10.0.1.0 then a sub-mask of 255.255.0.0 would allow control of the frame in its default and final configuration.

4.3 VisionWeb Home Page

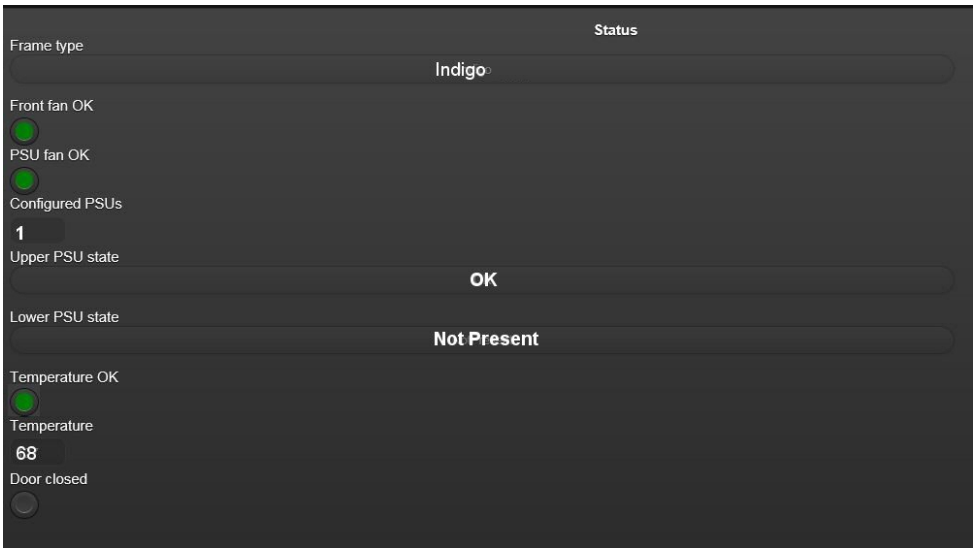
Wallbox Q-Down's internal web pages are called VisionWeb and enable the user to configure the frame, monitor status of the wallbox and cards, and to control cards from a PC running a web browser*. To access the VisionWeb home page, open up your web browser and enter the wallbox's IP address which will be the default value 10.0.0.201 if the wallbox has yet to be configured. The web page displayed shows the names of the cards installed, the slot number they are fitted into, and the firmware version and serial number. This page will give status information about the wallbox, its power supply and means to access each card's controls.

**Recommended web browsers include IE10, Google Chrome and Mozilla Firefox.*

VisionWeb Home page

Wallbox Q-Down has two Q-Down-AG 3G cards fitted internally which occupy slots ‘1’ and ‘2’. Click on either of the slots to access the card’s home page which will give the user a full range of controls and status monitoring. See Control and status monitoring.

Slot 13 is a virtual slot for the wallbox monitor. Accessing this slot will display information about the fans, power supply and frame temperature. The LEDs will be green for a ‘true’ condition’ else greyed out.



VisionWeb wallbox controller status display

4.4 VisionWeb Setup Pages

Click on the circle at the top left of the Home page to open the Indigo Setup home page:

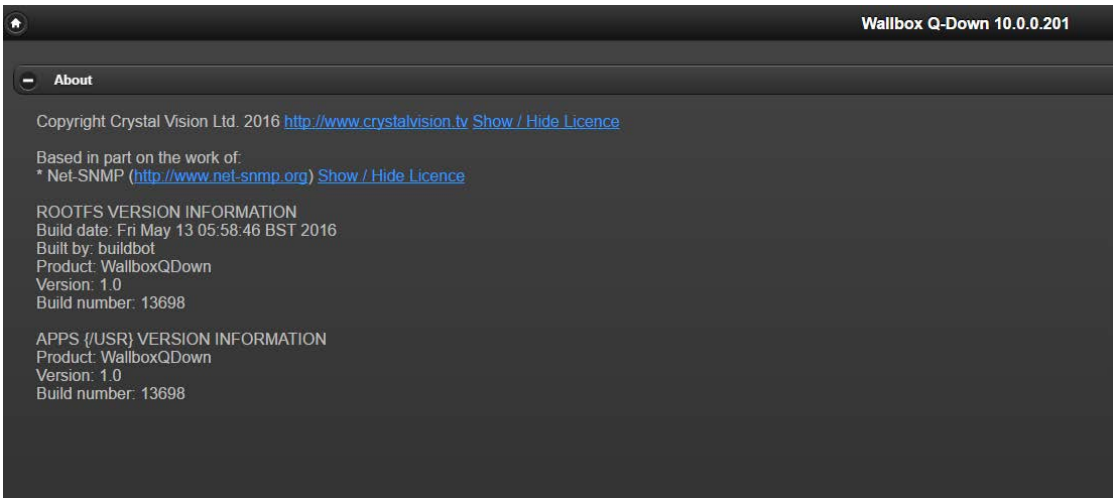
Click on the ‘house’ icon to return to the Home page:

The Setup page gives access to other pages that enable adjustment and give information of Network, Hardware, SNMP settings and diagnostic information:

VisionWeb 'options' page

About

From the Setup home page, clicking on the 'About' link will open a web page that shows amongst other things, the Wallbox Q-Down's software version number and build:

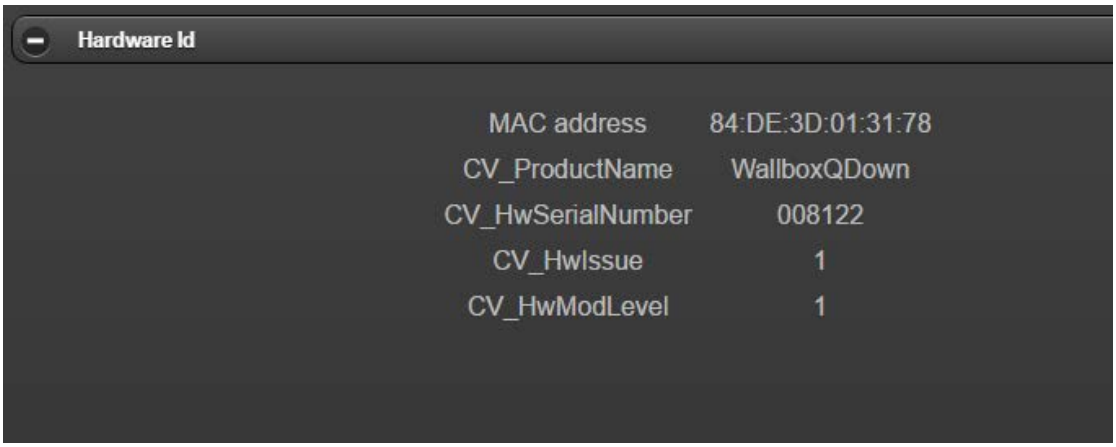


VisionWeb 'About' page

The above example shows that the **Wallbox Q-Down** controller is equipped with Wallbox Q-Down software version 1.0 build 13698. Crystal Vision may ask you to provide this information if there is a problem. SNMP enabled Crystal Vision products support SNMP, ASCII and HTTP/JSON control protocols. Contact Crystal Vision customer support for protocol details.

Hardware ID

This page gives useful information about the wallbox. Crystal Vision may ask you for these details if there is a problem:



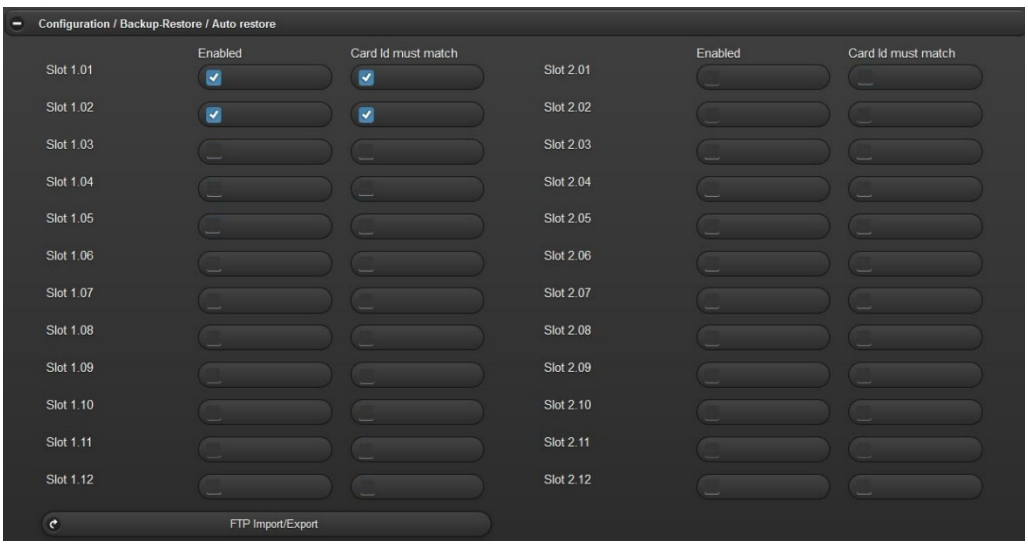
VisionWeb 'Hardware ID' page

MAC address	Unique MAC address of the frame's network card.
CV_ProductName	Product name – SNMP indicates that the wallbox supports optional SNMP control.
CV_HwSerialNumber	The serial number of the frame entered during manufacture and will be the front panel serial number. The serial number will be in the range 1-999999 and is a useful aid for identification or auditing purposes.
CV_Hwissue	The version of the frame hardware entered during manufacture.
CV_HwModLevel	Indicates modifications to the frame hardware.

Configuration/Backup-Restore/Auto restore

Whenever a card's settings are changed, a backup copy in the front panel processor (FPP) is automatically updated. This feature allows, for instance, a faulty card to be replaced live and its settings automatically transferred to the replacement.

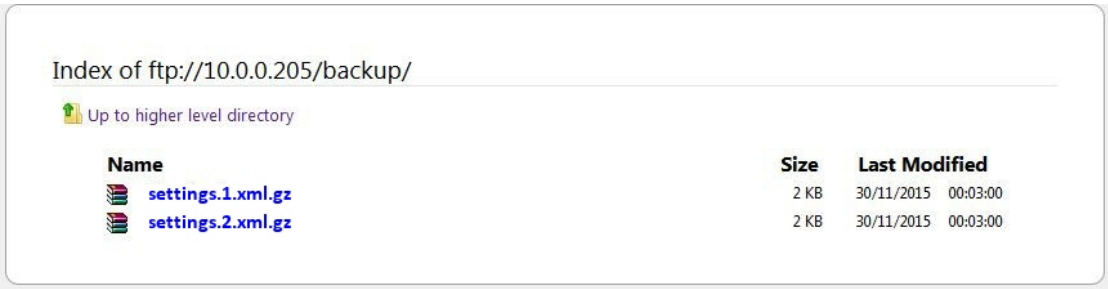
This web page sets the conditions for the restore of the card's settings from the stored backup. If enabled, this process happens automatically whenever the wallbox is powered or reset, or whenever a card is plugged in live:



The process can be enabled or disabled for each slot in the wallbox. If the 'Card ID must match' box is checked then the restore process will only happen if the card currently in the

slot is of an identical type to the card used to create the backup. If the box is NOT checked then the restore process will be applied to the card in the slot regardless of type. If in doubt, check the box. Note that the Configuration/Backup-Restore/Auto restore page shows 24 slots. This is to provide 'virtual card' slots which is one made up of controls from several cards in a frame and allocated a unique slot number. Virtual cards are not described in this manual as they have no or limited benefit for a two slot wallbox such as **Wallbox Q-Down**.

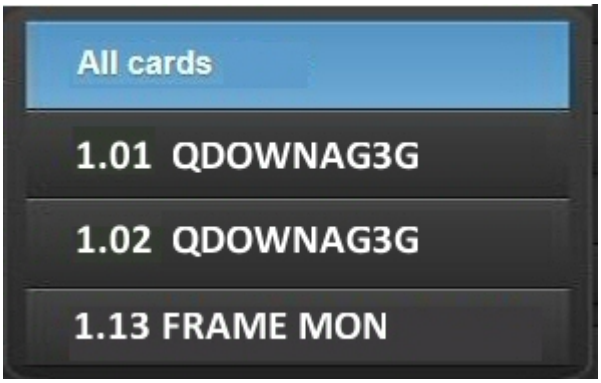
The 'FTP Import/Export' button opens an index to the 'backup' folder showing a list of the backup files that have so far been created:



Each backup file has a file name with a slot number extension. Up to 24 files, one per slot (including 'virtual' slots), will be displayed. Clicking on a file will transfer it to the PC's 'Downloads' area where it can be saved for future use – *see section File Structure for more information.*

Configuration/Backup-Restore/Manual restore

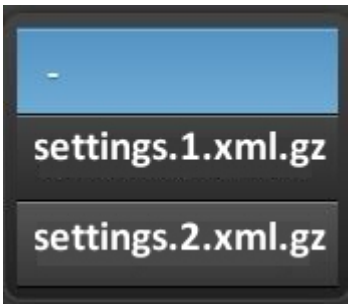
This page allows a user to select a backup file and to manually restore the settings for one or all of the slots. Firstly, click on the 'Slot' button to select either a single card or all of the slots to restore:



The window opened will display all the cards currently fitted in the wallbox. Similar to the 'Auto restore' page the check box 'Card Id must match' should be checked to ensure that a slot's settings are only restored if the backup memory was derived from an identical card type. The

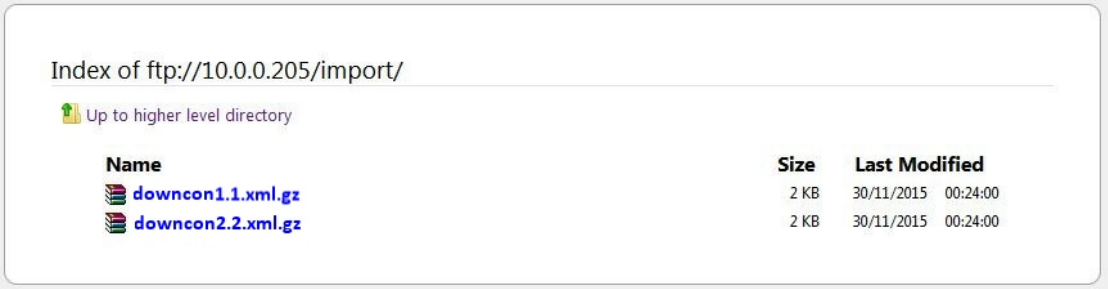
box can be left unchecked if the backup file and the card in the slot are versions of the same type of card. As before – **check the box if in doubt**.

The ‘Settings file’ button will display a list of backup files that are available for manual restoration. These files are backup files that have been copied manually from the ‘backup’ folder to the ‘import’ folder via FTP and may have been renamed. *See section File Structure for more information.*



Note also that a file created in a particular slot can be used to restore the settings into any or all slot positions. For example, if a card has been set up in slot 1, a number of similar cards can be fitted to the wallbox and the backup file applied to one or all of the cards to set them up the same as the original card. The ‘Refresh’ button will update this list.

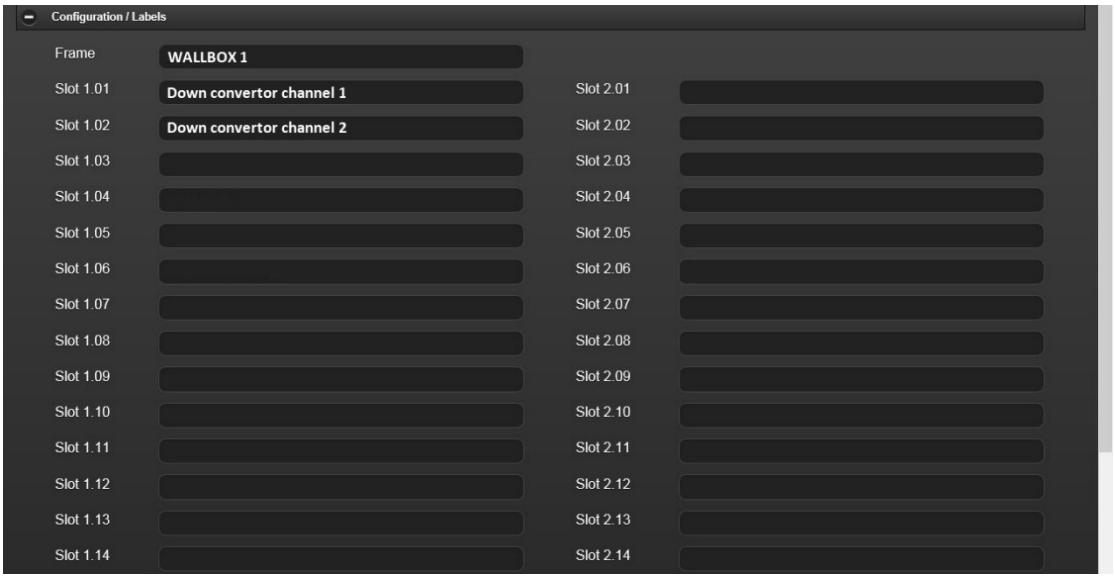
The ‘FTP Import/Export’ button opens a window to the ‘import’ folder showing a list of the backup files that have so far been manually copied and renamed there:



Finally, click on ‘Restore’ to overwrite the card(s) current settings and/or presets from the selected backup file.

Configuration/Labels

This page enables the user to add an alphanumeric label to the wallbox and to every slot.



VisionWeb 'Configuration/Labels' page

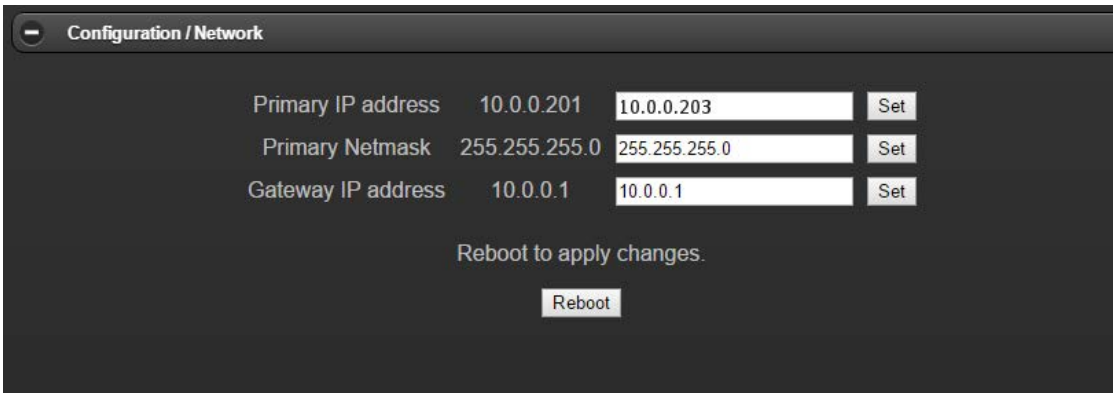
In the example above, slots 1.01 and 1.02 have been labelled, as has the frame itself. Note that the Configuration/Labels page shows 28 slots which is to provide slots for 'virtual cards'. A virtual card is one made up of controls from several cards in a frame and allocated a unique slot number. Once the labels have been created they are displayed on the 'Home' page:

VisionWeb 'Home' page showing labelled slots and wallbox.

Configuration/Network

From the Setup home page, clicking on the Network link will bring up the Network Setup page. If the installation includes more than one Wallbox Q-Down then the IP address will need changing as all Wallbox Q-Downs need a unique IP address. Enter the new IP address in the **'Primary IP address'** edit box and click on 'Set'. In the example below, the IP address will be changed to 10.0.0.203 from its default value.

The '**Primary** N**etmask'** address can also be changed on this page if required. The Gateway IP address should be set to 0.0.0.0 in the **Gateway IP address** box unless a router is in circuit, in which case the correct gateway address should be entered. Click on 'Reboot' to implement the changes and the web page should refresh itself showing the updated parameters.

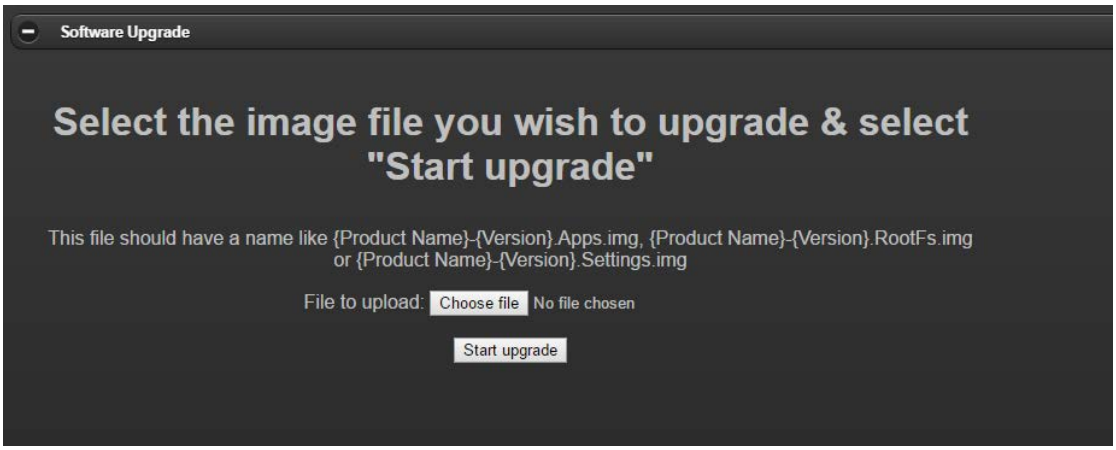


VisionWeb 'Network' configuration page

Software Upgrade

Clicking on the 'Software Upgrade' link will open a page that enables the wallbox software to be upgraded. You may be asked to perform an upgrade by Crystal Vision who will supply the software and instructions to perform this task.

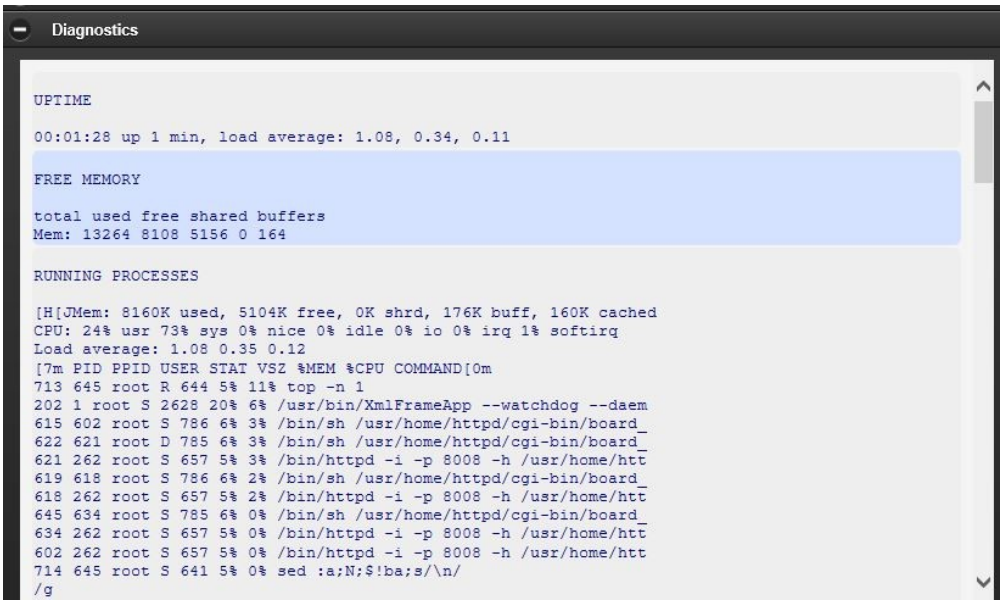
Typically, there are three image files Indigoxxx.RootFS, Indigoxxx.Apps and Indigoxxx.Settings. Each of the files is selected in turn and the upgrade performed on each before re-booting the wallbox. Do not attempt to do this without specific instruction from Crystal Vision or their representatives.



VisionWeb 'Software Upgrade' page

Diagnostics

The 'Diagnostics' link opens a page which will help Crystal Vision diagnose any faults encountered with your system. Crystal Vision may ask you to supply this information by copying and pasting part or all of the data:



Visionweb 'Diagnostics' page

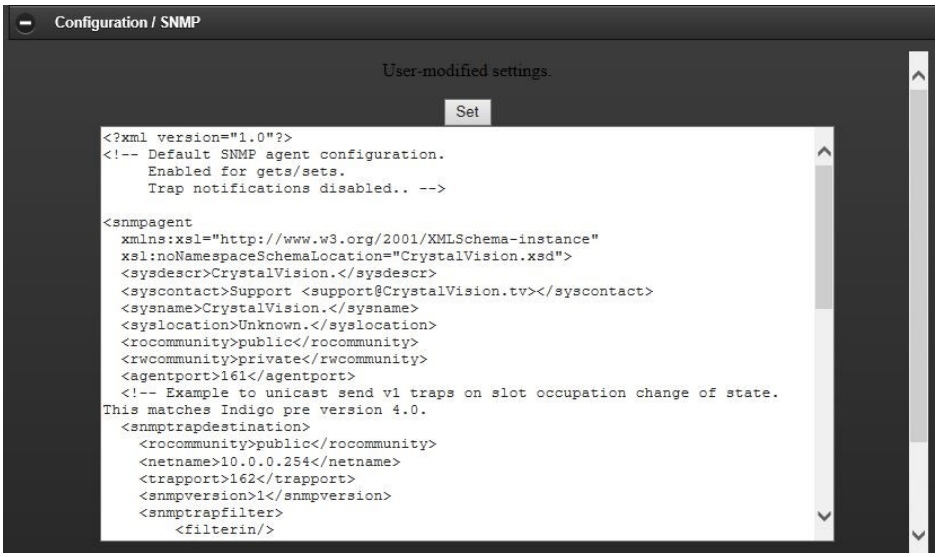
4.5 Configuration/SNMP

Access this window by clicking on the 'SNMP' link from the Setup home page. **Wallbox Q-Down** is SNMP enabled and can control and report status of cards, PSU and frames. SNMP traps can be used to trigger alarms for example, say, when a signal has been removed, video standard changed or any of the many monitored status variables change. The SNMP window can be edited and changes applied by clicking on '**Set'**.

Wallbox Q-Down front panel processors use the Net-SNMP agent and a Crystal Vision XML Schema Definition document to control its operation and the management information provided. The user-configurable SNMP configuration window easily allows the user to:

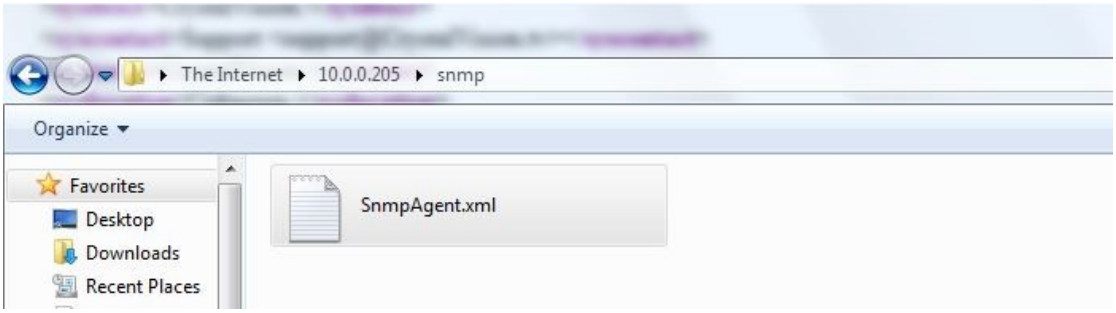
- Edit the list of configuration files.
- Program the IP and port address of the destination SNMP Manager.
- Enable or disable individual trap events individually by OID.
- Select SNMP v1 or v2 operation.

The full list of available XML commands is contained within the Schema Definition document **CrystalVision.xsd** available from Crystal Vision.



VisionWeb 'SNMP' configuration page

The SNMP agent can also be accessed via FTP – *see section File Structure for more details*.



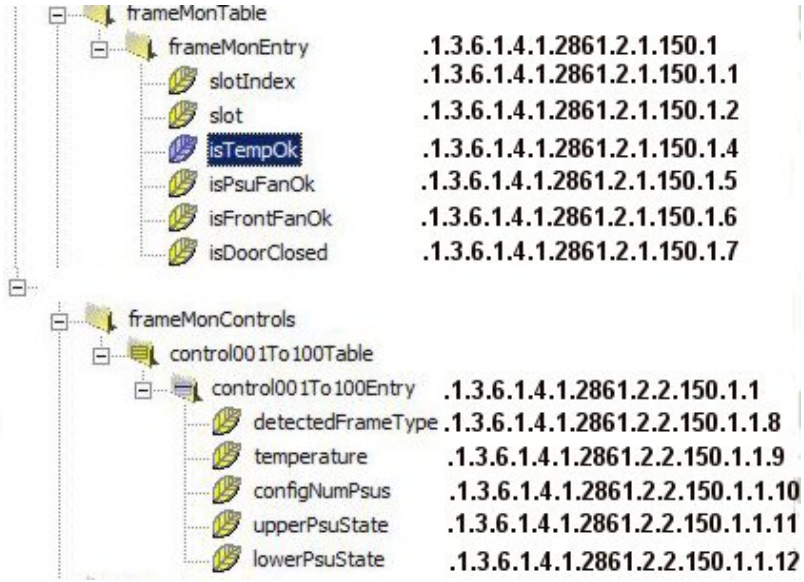
Management information base (MIB)

As is normal for an SNMP manager system, each of the remotely-controllable boards, frame and PSUs that are to be monitored has an associated MIB. Each MIB is a collection of object identifiers that identify all variables that can be read via SNMP and are available from Crystal Vision. Use a MIB Browser to view all status and control possibilities.

Object Identifiers (OID)

For each variable to be monitored there is an object identifier or OID which can be distinguished from any other OID within the MIB tree by a unique number sequence coded within the MIB. As an example, from the FrameMon MIB (see tree below), the front panel status variable **isTempOK** is accessed by the OID **1.3.6.1.4.28681.1.2.1.150.1.4**. The OID will then be accompanied by a value to indicate its status, in this case, 1= NO, 2= YES. Any status change will cause the transmitting of a trap to the SNMP manager.

The following grab from a MIB Browser shows the FrameMon MIB tree with its identifying number sequences:



Partial tree of FrameMon MIB showing identifiers

The frame variables monitored by the FrameMon MIB are:

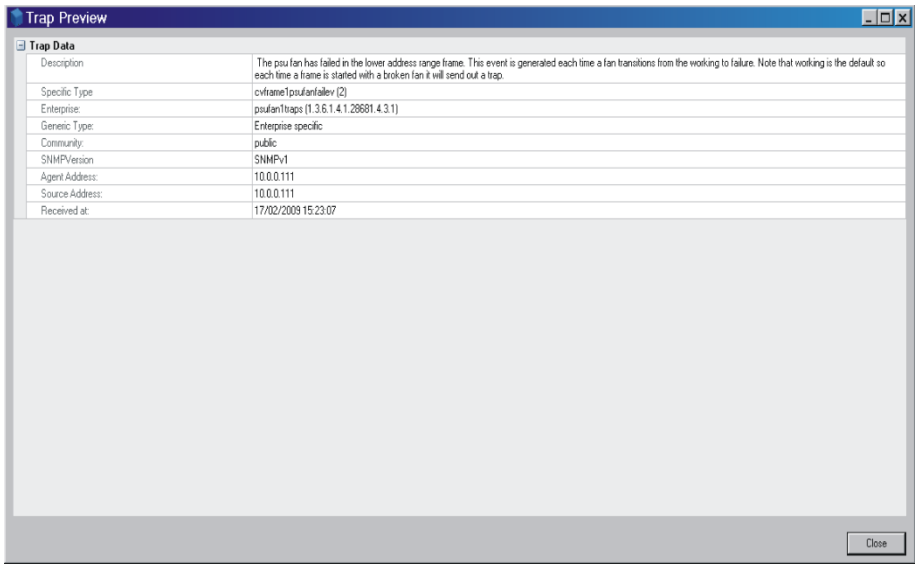
Name	Function	Syntax	Value
Slot	Frame's virtual slot number	INTEGER 0..31	1.1...2.16
isTempOk	Frame temperature OK?	INTEGER	1=NO, 2=TRUE
isPSUFanOk	Frame's PSU fan OK?	INTEGER	1=NO, 2=TRUE
isFrontFanOk	Frame's front panel fan OK?	INTEGER	1=NO, 2=TRUE
isDoor Closed	Frame's front panel closed?	INTEGER	1=NO, 2=TRUE
detectedFrameType	Type of Indigo frame	INTEGER	0=Indigo1, 1= IndigoDT, 2=Indigo4, 3=Indigo2, 4=Indigo1AE, 5= IndigoDTAE, 7= Indigo2AE
temperature	Frame temperature	INTEGER 0..127	0...1...2...127
configNumPsus	No. of PSUs fitted	INTEGER	Number of PSUs e.g. 1, 2 etc.
UpperPsuState	Condition of upper PSU	INTEGER	0=OK, 1=Alarm, 2=Not present, 3= Configuration error.
LowerPsuState	Condition of lower PSU	INTEGER	0=OK, 1=Alarm, 2=Not present, 3= Configuration error.

FrameMon MIB variables

Traps

Whenever a status or control value changes a trap will be sent to the SNMP manager unless filtered (see MIB for trap OIDs). By interrogating this trap it is possible to identify the status change and its consequences. It will be quite common for multiple traps to be sent for any

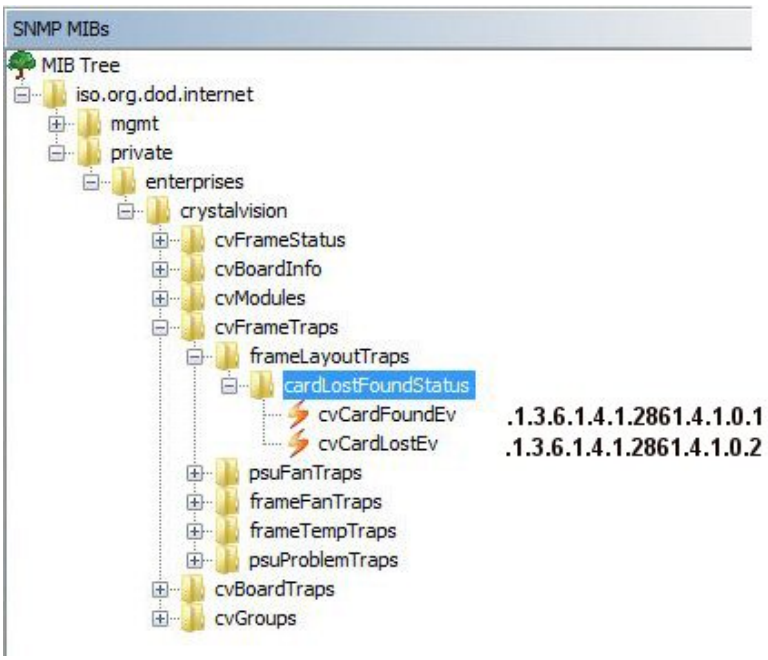
one incident – for example, removing an input may typically trigger eight traps, it will then be down to the SNMP manager to sort these into a hierarchical order or mask as necessary.



Example of a trap received by the SNMP manager

Filters

Any status or control value change can potentially send a trap but these can be filtered by information in the configuration file. The following extract from the MIB tree shows two events with their OIDs that will generate traps if a card is found or lost:



Unless previously edited, the SNMP configuration window will show an example of enabling the trap filter using the events shown above:

```
<-- Example to unicast send v1 traps on slot occupation change of state.  This matches Indigo pre version 4.0.
<snmptrapdestination>
<rocommunity>public</rocommunity>
<netname>10.0.0.254</netname>
<trapport>162</trapport>
<snmpversion>1</snmpversion>
<snmptrapfilter>
<filterin/>
<snmpoidmask>1.3.6.1.4.1.28681.4.1.0.1-2</snmpoidmask>
</snmptrapfilter>
</snmptrapdestination>
-->
```

Extract from SNMP configuration window showing example of trap filtering

4.6 Control and status monitoring

Accessing the Indigo home page with a PC browser via the Ethernet connector will display a list of the cards fitted:

Indigo home page

Note that **Wallbox Q-Down** has two different entries, one for each channel, that correspond to the two Q-Down-AG 3G cards that are fitted internally. Both channels are independent, changing the controls of one has no effect on the other.

Clicking on either **Wallbox Q-Down** channel will open up the ‘status’ home page of the VisionWeb control interface for this product.

Wallbox Q-Down 'Status' web-page.

All of **Wallbox Q-Down** controls can be adjusted and monitored via the VisionWeb interface. See section Control Descriptions for details of each of the controls with screen grabs.

4.7 Password protection

It is possible to password protect different levels of access to either or both channels of **Wallbox Q-Down**. The default state is no active passwords. **Wallbox Q-Down** channel 1 occupies slot 1 of the wallbox and channel 2 occupies slot 2.

When setting up a user you will be able to limit the slots that have full/read/write access. If no access list is specified all slots will be read/write.

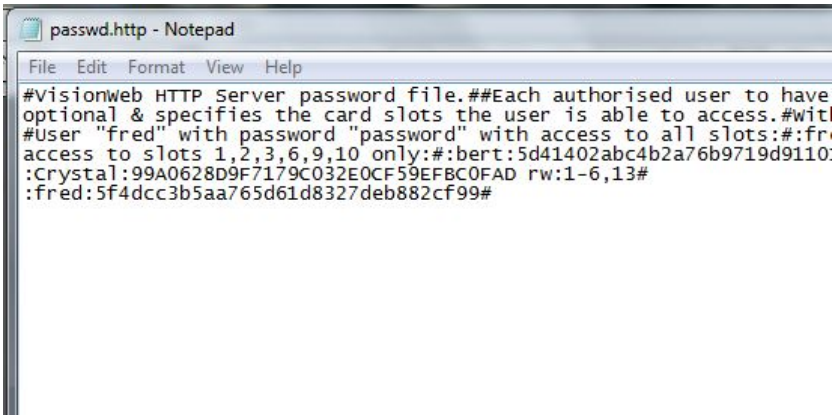
To add a new user:

- Pick the user name and password – say, 'Crystal' and 'Vision'.
- Generate the encrypted password information as an MD5 text string. This can be obtained from *http://onlinemd5.com/* or similar sites – Google 'md5 generator' for more sites.
- Enter the password to be encrypted, in this example 'Vision'. The MD5 generator will produce the following string - 99A0628D9F7179C032E0CF59EFBC0FAD.
- Follow the instructions in section *File* Structure to copy the file passwd.http' to your PC from the folder **'/etc'**.
- Open the copied file with Notepad and edit the file to add every authorised user with a separate line of the format - username:MD5 Password [rw:slotlist]) as described in the file itself. [rw:slotlist] is optional & specifies the card slots the user is able to access. With no rw option, all slots & the frame options pages are accessible. e.g.

  User "fred" with password "password" with access to all slots -
  :fred:5f4dcc3b5aa765d61d8327deb882cf99
  User "bert" with password "hello" with access to slots 1,2,3,6,9,10 only -
  :bert:5d41402abc4b2a76b9719d911017c592 rw:1-3,6,9-10
  For our example, with slots 1,2,3,4,5,6,13 only enabled, the new line will be -
  :Crystal:99A0628D9F7179C032E0CF59EFBC0FAD rw:1-6,13

  Note: To access the VisionWeb 'Options' page, slot 13 (Frame Monitor) must be enabled.

Note: The # symbol indicates that the rest of the line is comment.



Editing the 'passwd.html' page in Notepad

- Exit and save changes.
- Copy the file back to the frame replacing the original version.
- Reboot the frame. Once the frame has rebooted the new access permissions will apply and a Windows Security window will open when a VisionWeb user attempts to access a slot or the frame's settings:

Windows Security window

You can add multiple new users at the same time if you want, by adding multiple lines at the file editing stage.

To delete a user:

To disable authentication, so that no username/password is required:
Delete all the users from the passwd.http file by deleting the relevant lines. Leave the rest of the file in place, in case you want to enable passwords in future. Needs a reboot to take effect.

Logging out from a password-restricted wallbox

The password system we use (HTTP Basic Access Authentication) is a standard system that works with web browsers. The browser generally stores the password information while the session is open, although it may time out after a long period of inactivity. That is a browser characteristic not controlled by the frame and if users want to prevent unauthorised access they should close the browser window (**not just the tab**) when they want to 'log out'. This will force a log in next time the frame is accessed.

If the user selects 'remember this password' when they type it in, then their PC will remember the password and the user is relying on the PC login to restrict access to the frame.

5 Control Descriptions

The controls of **Wallbox Q-Down** are accessible from Crystal Vision's VisionWeb software, SNMP and VisionPanel. The description of controls used in this manual is based on VisionWeb but the path to locate controls by other means follows the same logic.

VisionWeb controls are accessed by menus at the bottom of the page which, when selected, offer sub-menus containing a number of controls. Some controls are simulated LEDs that are used to show status, others are check boxes, buttons or sliders which change various **Wallbox Q-Down** settings.

The description of the menus is in the order shown in the GUI i.e.

VIDEO STATUS, AUDIO STATUS, OUTPUT FORMAT & TIMING, FIXED ASPECT RATIO, RGB PROC, YUV PROC, FIBRE OPTIC ENABLE, ANAMORPHIC, ANAMORPHIC CROP, 16X9 LETTERBOX, 16X9 LETTERBOX CROP, 14X9 LETTERBOX, 14X9 LETTERBOX CROP, CENTRE CUT, CENTRE CUT CROP, BORDER, AFD & WSS DATA, TIMECODE & CLOSED CAPTION, PRESETS, RESETS, GPO ALARMS, ALARM DELAYS.

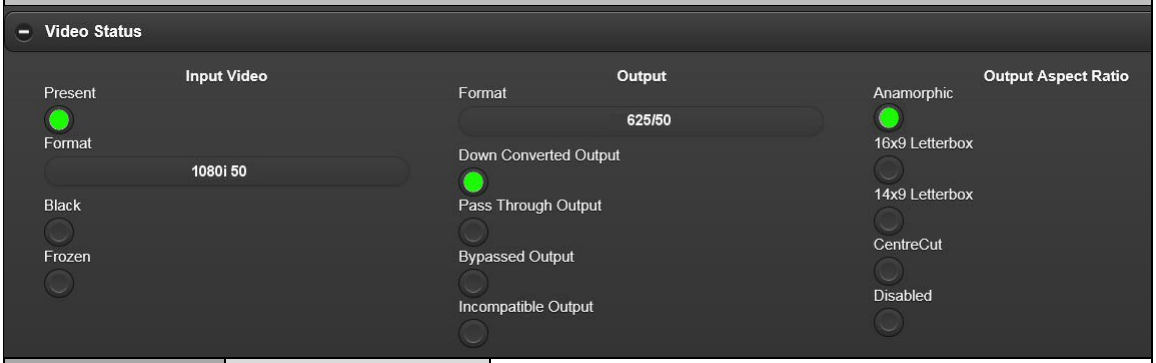
Note: Anamorphic, 16x9 Letterbox, 14x9 Letterbox and Centre Cut menus are identical in controls and layout and are only described once, as are the associated 'crop' menus. Each menu is shown with a screen grab and description of each control's function. Some menus and some controls are specific to specific models only, in this case the model number(s) are indicated.

Note: **Wallbox Q-Down** is one of a range of Q-Down models and the remote control protocol caters for all versions. For **Wallbox Q-Down**, some of the following controls should NOT be adjusted by the user as this will adversely affect the operation of the unit. For example, the controls that enable the fibre input should not be changed. Controls that should not be altered and those controls that, although present in the VisionWeb interface, have no function are indicated in the following descriptions:

5.1 Video Status Menu

Video Status

Display presence, standard and status of input and output video signals.



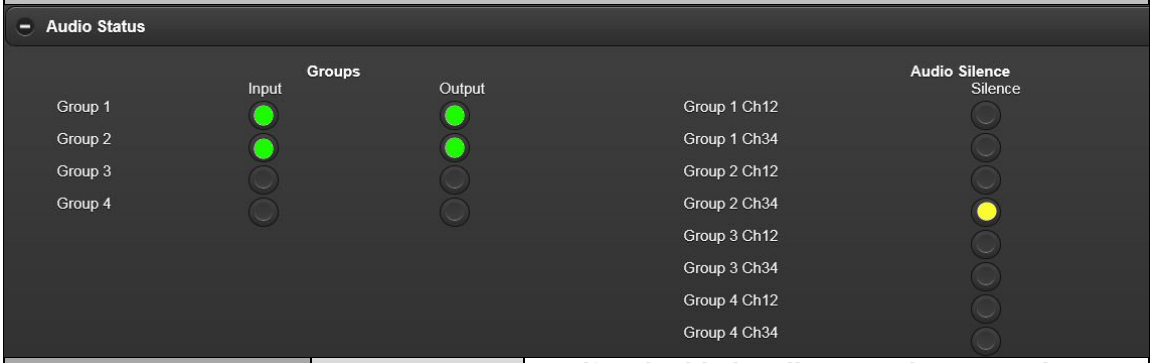
Input Video	**Present**	**On if a video input is present.**
	Format	**Displays the video standard of the input i.e. '1080i 50'.**
	Black	**On if the video input is at black level. Video black is defined as values in the range of 58 to 70 around digital black (+/- 5mV). If digital black is present for longer than the delay time set by the video black delay control, a video black error will be flagged.**
	Frozen	**On if the input video is frozen. A picture is considered frozen when a frame is identical to the previous frame. If this condition is met consistently for the period of time set by the video frozen delay control, a video frozen error will be flagged.**
Output	**Format**	**Displays the output video standard i.e. '625i 50Hz'.**
	Down Converted Output	**This LED will be illuminated when the Wallbox Q-Down is down converting.**
	Pass Through Output	**Whenever the input format is the same as the selected output format this LED will be illuminated. When in this mode all aspect ratio controls will be disabled along with the vertical filtering. The analogue output selection remains active along with the analogue and digital RGB and YUV proc-amps and the delay controls.**
	Bypassed Output	**This LED will be illuminated when the Wallbox Q-Down has been set to bypass by checking the Bypass box in the 'Output Format & Timing' menu. For the Wallbox Q-Down to enter bypass mode both the input and output selection must be the same otherwise the bypass command will be ignored. As it's not possible to select a 3G**

		output, selecting bypass will also be ignored with a 3G input present. In bypass mode the analogue output selection remains active along with the analogue RGB and YUV proc-amps and the delay controls. The digital proc-amps will be disabled and the SDI delay through the Wallbox Q-Down will be set to its minimum processing delay. (SD approximately 2uS delay and HD less than 1uS delay.)
	Incompatible Output	**This LED will be on should the video input format and output format selection become incompatible, which would be the case if the input is a lower bit rate than the output selection.**
Output Aspect Ratio	**Anamorphic 16x9 Letterbox 14x9 Letterbox Centre Cut**	**These LEDs indicate what aspect ratio correction is being performed. There are four fixed aspect ratios which are: Anamorphic, 16:9 Letterbox, 14:9 Letterbox and centre cut. Anamorphic will map the input picture directly to the native aspect ratio of the viewing display along with the resulting distortion associated with this. Should it be necessary to view the output on a 4:3 display, setting the aspect ratio selection to Letterbox will give the correct picture dimensions by adding black bars to the top and bottom of the picture. Selecting 14:9 Letterbox will crop the picture to 87.5%, and depending on the aspect ratio of the display will either add black bars to the top and bottom or both sides of the picture. There will be some loss of picture. Centre cut will show the central 75% of the 16:9 widescreen picture mapped to the full monitor height with the corresponding loss of the left and right picture edges.** *See section Aspect Ratio Correction for more details.*
	Disabled	**The ARC is disabled when in 'bypass' or 'pass-through' mode.**

5.2 Audio Status Menu

Audio Status

Display status of embedded audio signals.

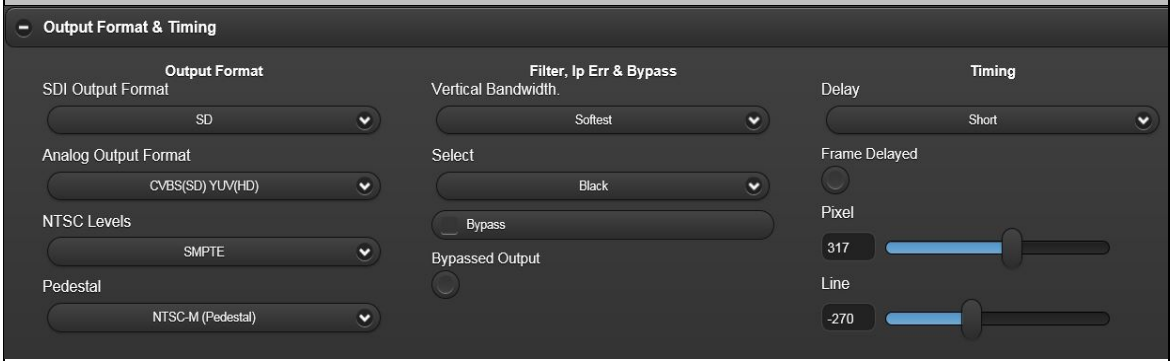


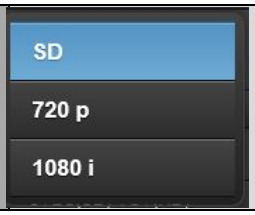
Group 1-4	**Input**	**On if embedded audio group is present in input video.**
	Output	**On if embedded audio group is present in the output video.**
Group 1-4, Ch 12,34	**Silence**	**On if any of the embedded audio channel pairs are silent.**

5.3 Video Settings Menu

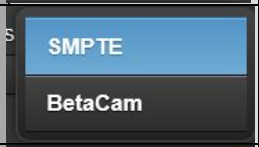
Output Format & Timing

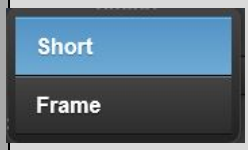
Select output SDI and analogue video formats.



SDI Output Format		**This control should be left as 'SD' output.**

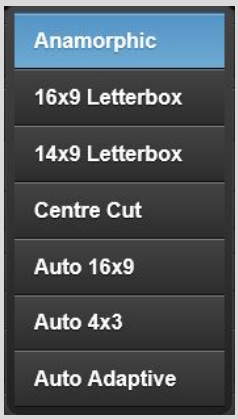
Crystal Vision Descriptions	Control

Analog Output Format		**This control should be left as 'CVBS(SD)' output format.**
NTSC Levels		**Set the luminance, chrominance and sync levels to the correct values for either SMPTE/EBU N10 or Betacam standards.**
Pedestal		**Set black level offset for NTSC standard.**
Vertical Bandwidth		**When down converting, the vertical bandwidth can be optimised for a given application by selecting the most appropriate vertical bandwidth filtering. There are four filters to select from, ranging from the highest (sharpest) to the lowest (softest).**
Select		**Should the video input format and output format selection become incompatible, for example in the situation where the input is a lower bit rate than the output selection, the output can be set to go to black, blue or muted to no output.**
Bypass	**With an SD input enabling the bypass control will set the Wallbox Q-Down into bypass mode whenever the input and the selected output format are the same. In bypass mode the analogue output selection remains active along with the analogue RGB and YUV proc-amps and the delay controls. The digital proc-amps will be disabled and the SDI delay through the Wallbox Q-Down will be set to its minimum processing delay. (SD approximately 2us delay.)**	
Bypassed Output	**On whenever Wallbox Q-Down is in 'bypass' mode.**	

Delay		**When short delay is selected the minimum delay available is 16 lines. This limit is imposed to prevent possible frame tearing at delays less than this minimum. If the delay is set to less than 16 lines one frame of delay will be automatically added to the output, so for delays of less than 16 lines the actual delay will be one frame plus the adjustable delay.** *Note that any negative delay dialled will be one frame less the negative delay.* **Selecting Frame Delay will add a fixed one frame delay between input and output. The variable delay slider controls will now allow an adjustment of +/- 1 frame in lines and pixels.** *Note that the maximum delay in lines for any output format is one frame. Any number of lines dialled greater than one frame will be ignored and return the maximum delay of one frame. Similarly, the maximum delay in pixels cannot exceed one output line.*
Frame Delayed	**The Frame Delayed LED will illuminate whenever the one frame delay is added.**	
Pixel/Line	**The video delay controls are made up of two mode controls and two variable sliders giving +/- 1 line in pixels and +/- 1 frame in lines.**	

Fixed Aspect Ratio

Set up output aspect ratio correction.

SD Analog Line Length	**Set the SD output line length to be equal to analogue video.**	
ARC		**Choose Aspect Ratio Correction for the output picture. There are four fixed aspect ratios which are: Anamorphic, 16:9 Letterbox, 14:9 Letterbox and centre cut.** **Selecting Auto 16:9 for all AFD input codes will give an Anamorphic aspect ratio conversion and for a 625-line output WSS will be set to 16:9 full frame.** **When set to Auto 4:3 the output aspect ratio and WSS data will depend on the input AFD. Undefined/reserved and full frame codes will produce a Letterbox aspect ratio with the output WSS set to 16:9 Letterbox. Pillarbox 4:3,**

		Pillarbox 14:9 and Letterbox greater than 16:9 will give a centre cut conversion and set output WSS to full format 4:3. **Selecting Auto Adaptive for any full frame input will give an Anamorphic aspect ratio with WSS set to full frame 16:9. Pillarbox 4:3 will give a centre cut conversion and set output WSS to full format 4:3. Undefined/reserved, Pillarbox 14:9 and Letterbox greater than16:9 will make no change so the previous conversion will remain. On power up the default conversion will be Anamorphic.** *See section Aspect Ratio Correction for more details.*

RGB Proc-Amp

Set up lift and gain of the output signal in the RGB domain.

RGB Lift and Gain	**Wallbox Q-Down's RGB lift and gain controls allow independent digital image adjustments in the RGB domain, essential for maintaining colour fidelity. In normal operation the RGB proc-amp is active simultaneously on both the digital and analogue outputs. Should the Wallbox Q-Down be put into bypass mode the proc-amps will only effect the analogue output. The digital proc-amps will be disabled as shown by the Disabled status LED.**
Disabled	**On if the RGB Lift and Gain controls are disabled in 'Bypass' mode.**
Cal	**Return the Lift and Gain controls to their default values of 0 lift and 100% gain.**

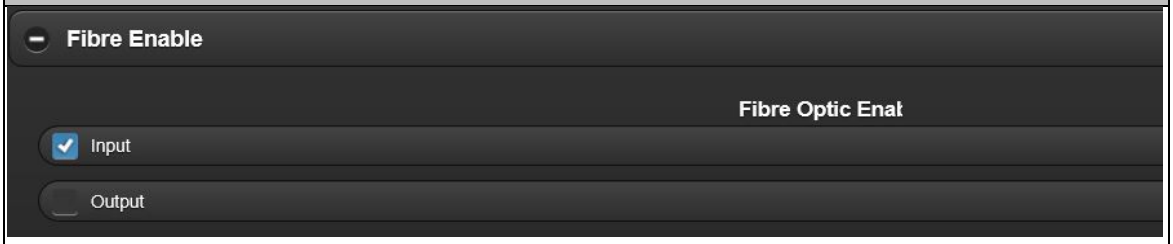
YUV Proc-Amp

Set up lift and gain of the output signal in the YUV domain.

YUV Lift and Gain	**Wallbox Q-Down's YUV lift and gain controls allow independent digital image adjustments in the YUV domain, essential for maintaining colour fidelity. In normal operation the YUV proc-amp is active simultaneously on both the digital and analogue outputs. Should the Wallbox Q-Down be put into bypass mode the proc-amps will only affect the analogue output and the digital proc-amps will be disabled.**
Cal	**Return the Lift and Gain controls to their default values of 0 lift and 100% gain.**

Fibre Optic Enable

Select fibre optic options.

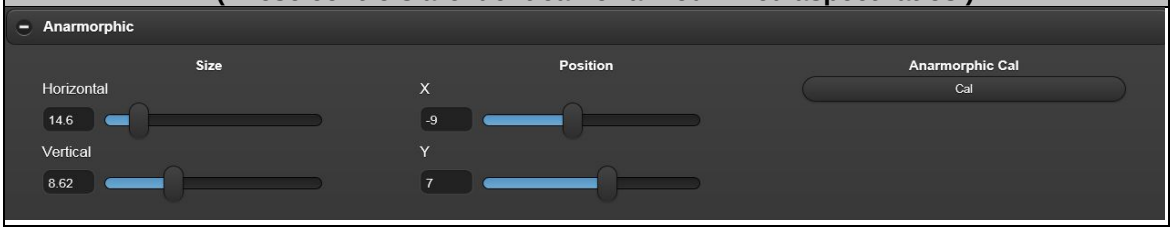


Input	**The Fibre Optic 'Input' control must be left selected.**
Output	**The Fibre Optic 'Output' control must be left de-selected.**

5.4 Custom Aspect Ratio Menu

Anamorphic, 16x9 Letterbox, 14x9 Letterbox, Centre Cut

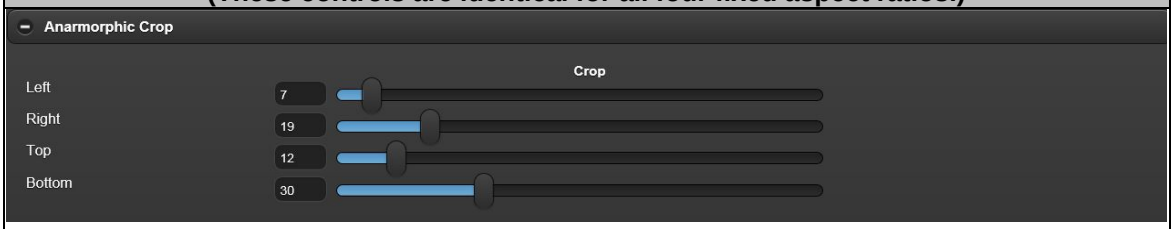
Adjust size and position of the four fixed aspect ratios.
(These controls are identical for all four fixed aspect ratios.)



Horizontal, Vertical Size	**These controls alter the output image size. These adjustments will be recalled whenever the fixed aspect ratio is re-selected.**
X, Y Position	**Adjust position of output image. These adjustments will be recalled whenever the fixed aspect ratio is re-selected.**
Cal	**Return fixed aspect ratio to its default size and position.**

Anamorphic, 16x9 Letterbox, 14x9 Letterbox, Centre Cut - Crop

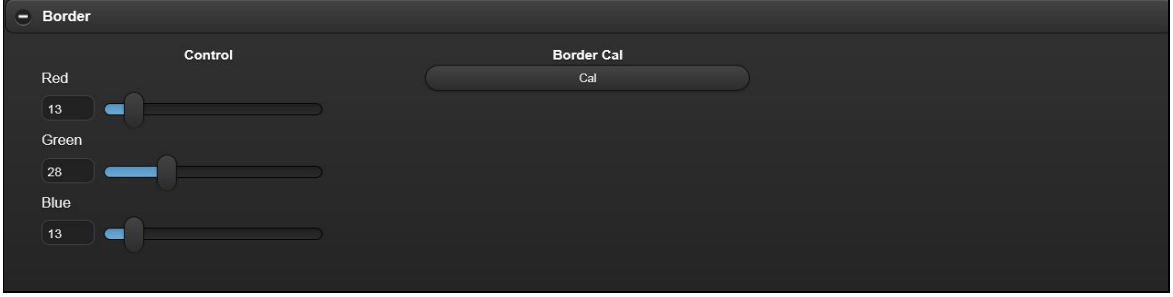
Crop the output image.
(These controls are identical for all four fixed aspect ratios.)



Left / Right / Top / Bottom	**Crop the output image. These adjustments will be recalled whenever the fixed aspect ratio is re-selected.**

Border

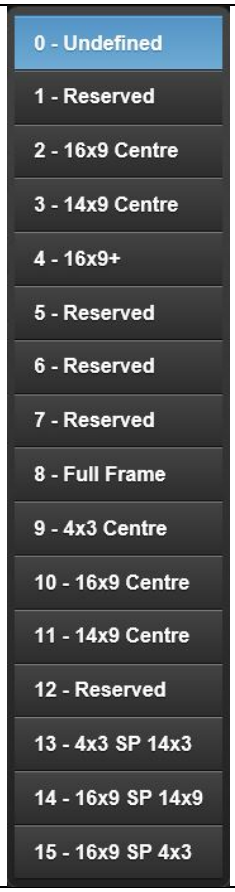
Select the colour of the border around an aspect ratio corrected image.



R,G,B	**Select the colour, in the RGB domain, of the border that will appear around an image that no longer fills the screen due to aspect ratio correction and/or cropping. Set between black and peak white.**
Cal	**Return the border colour to black.**

5.5 Data Insert Menu

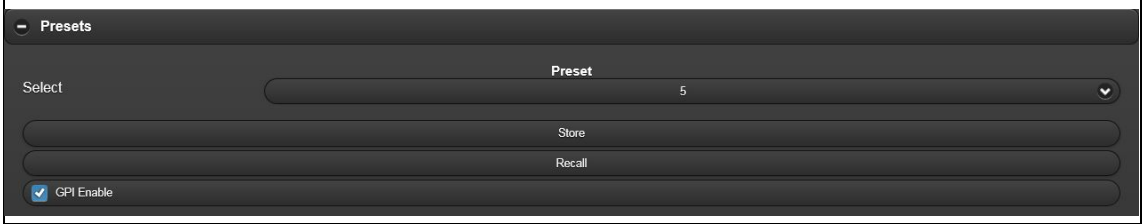
AFD & WSS Data	
Select line numbers to output AFD/ATC or VITC.	
	
AR	**Display incoming AFD aspect ratio descriptor. i.e. 16x9, 4x3.**
AFD	**Displays incoming AFD descriptor. i.e. 'undefined, full frame, 16x9 Centre' etc. See section Output AFD and WSS for more information.**
AFD Output	 **Select mode control 'Auto' to automatically set the AFD output codes based on the output aspect ratio and incoming AFD codes. Select 'Pass' to use the incoming AFD code. 'Manual' to output the AFD code as selected below.**
AFD AR	 **Select aspect ratio of entire image. For instance, if the output is a 16x9 letterbox image within a 4x3 frame, select 4x3 for AR and AFD Code '10'.**

AFD Code		**Code for active image area. See section Output AFD and WSS for more information.**
WSS Output		**Output widescreen signalling can be set to automatically follow the input AFD data or be manually selected. If WSS data should be present on the input video, this can either be passed to the output unchanged or substituted for a user selectable code. WSS data can also be set to be blanked. It is only possible to insert WSS information into a 625 output.**

5.6 Presets, Reset & GPI/Os Menu

Presets

Up to 16 user-defined configurations may be stored and recalled from VisionWeb. Presets store the board setup data including operating mode card status. The presets are numbered 1-16.



Select		**Store or recall Wallbox Q-Down's configuration to one of 16 memory locations. (Only presets 1-10 shown.)**
Save	**Select to save the current Wallbox Q-Down configuration to the selected preset location. If the selected location contains previously saved setting information it will be overwritten by the new data.**	
Recall	**Select to recall a new configuration from one previously saved in the selected preset location.**	
GPI Enable	**Wallbox Q-Down has no GPIs so this control has no function.**	

Resets

Reset the board to its default settings.

Fact. Res Exc Preset	**Reset the board to default settings but leave preset memories unaffected. (See Default Values table below.)**
Fact. Res Inc Preset	**Reset the board to default settings and erase preset memories.**

Parameter	Default values
Output Format Analogue ou	SD CVBS, SMPTE an

Output Fibre Optic I/O	dNJSCM Unchanged
Aspect ratio	Anamorphic
Vertical bandwidth	sharp
Cut	Auto,

Input AFD Coded Frame Wide Screen Signalling H Size (all) V	8-Full Frame 4:3 Auto 16 9

Size (all) Position and Crop Border Hue Proc-amp lift (all	0 0 (Black) 0

l) Proc-amp gain (all) GPC alarms TC & CC 525/625 lines	100 unchecked 525-AFD/ATC line 12, VITC lines 14 & 16,

ction	CCline 21.625-AFD/ATCline 8, VITC lines 19 & 21.
ATC Output Enable	unchecked
Lock Output	unchecked

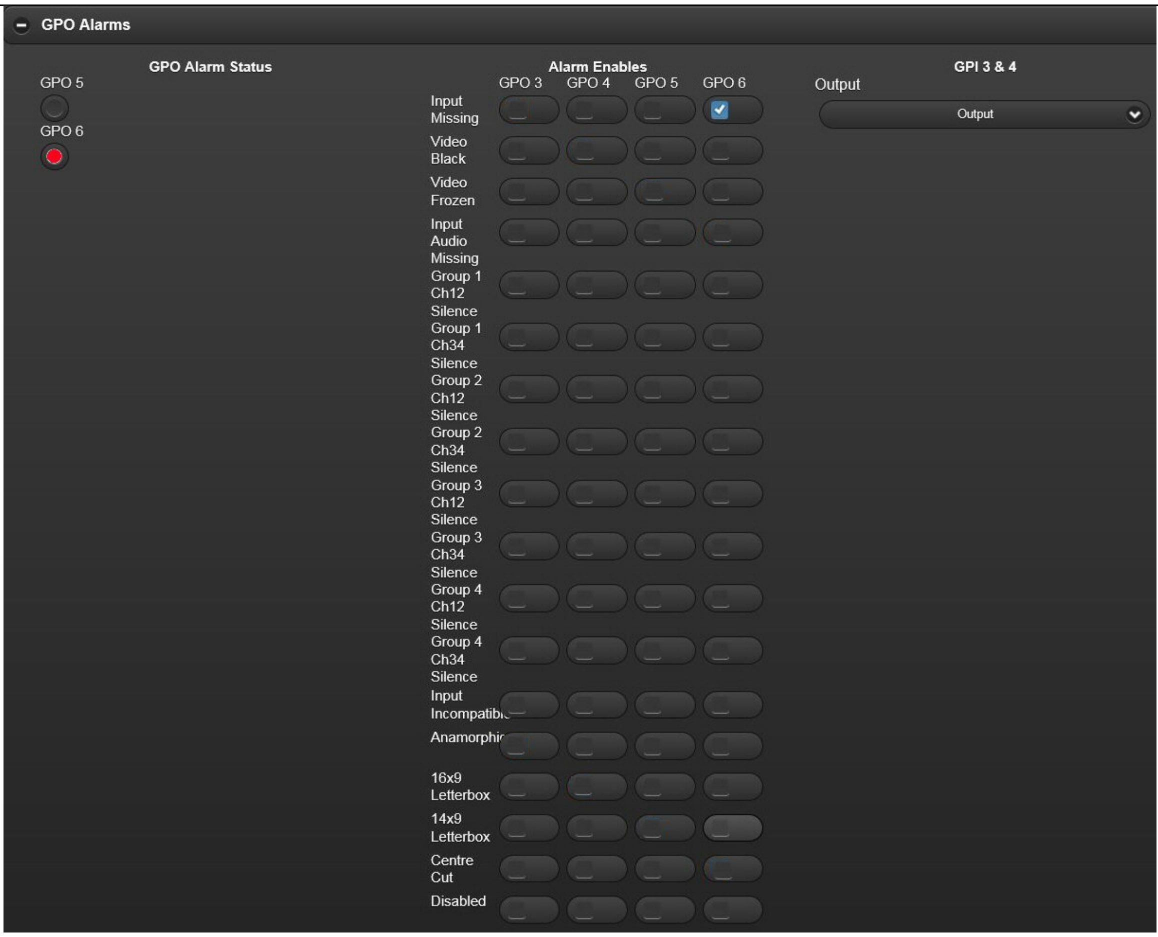
output to ATC Input Alarm delay video	1
black Alarm delay vide	1

Frozen Alarm delay	10 seconds
audio silence Video delay	Framed delay, Pixels 0, Lines 0
Bypass	unchecke

Presets	Set to Preset 1 and all contents erased
GPI Enable	Not enabled

GPO Alarms

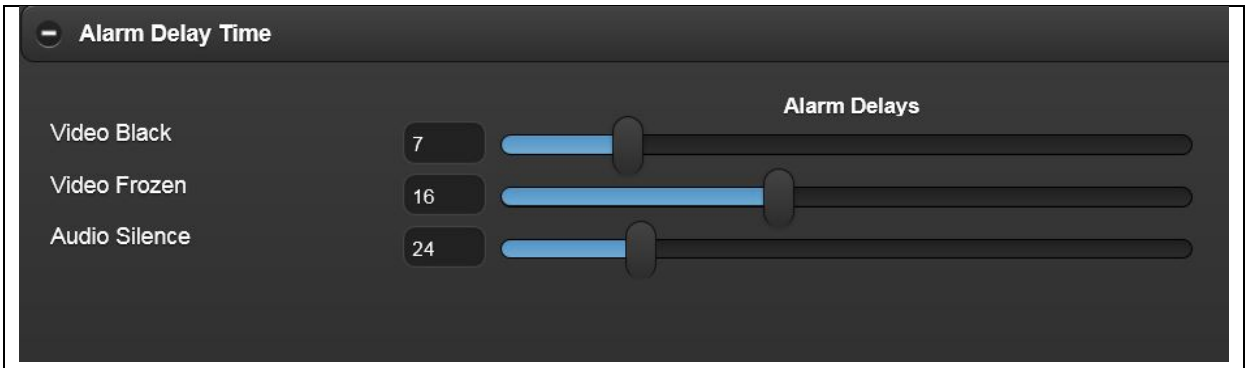
Wallbox Q-Down has no physical GPOs so these controls mostly have no function. There are two controls, however, that should be left as shown below.



Alarm Enables	Input Mi	Leave th
GPI 3 & 4		Leave

Alarm Delays

Wallbox Q-Down has no GPO connections so the Alarm Delay Timers have no function.


Alarm Delay Time
Alarm Delays
Video Black
7
Video Frozen
16
Audio Silence
24

6 Aspect Ratio Correction

Wallbox Q-Down has the ability to deal with any HD to SD aspect ratio conversion requirements. You can select a 16:9 Anamorphic output for 16:9 SD systems and either a 16:9 to 4:3 Letterbox, 16:9 to 4:3 Letterbox compromise, or 16:9 to 4:3 Full Screen with centre cut for 4:3 SD systems.

Wallbox Q-Down also allows you to customise the shape of your output picture. Each of the standard aspect ratios can be individually adjusted away from the default values to create customised versions by using four independent sets of size, position and crop controls.

Wallbox Q-Down ensures the picture is always the right shape by coping with both analogue and digital SD blanking widths – particularly useful for feeds that are up and down converted multiple times. When used with an Anamorphic conversion, the 'SD Analogue Line Length' option puts the active 1920 pixels from a 1080i or 1080p picture into 702 pixels of SD (rather than 720 pixels), with the rest of the pixels used to represent analogue blanking – which prevents the SD signal from losing the sides of the picture. All other aspect ratios are adjusted by a similar amount.

Wallbox Q-Down can automatically choose the appropriate aspect ratio according to the SMPTE 2016 AFD data embedded in the 3Gb/s or HD input video. HD programmes are often made of a mixture of true High Definition sources and SD-originated sources that have been up converted, and the SMPTE 2016 AFD code in the signal gives information about which areas of the screen contain a picture and which areas have black 'padding'. The down converter needs to read this signal and select the correct aspect ratio conversion to be used with the down conversion.

Wallbox Q-Down offers three options for the SD output. In **Auto 16:9 mode** the SD outputs can be set to be always 16:9 and in this case it will perform the down conversion without ever changing the aspect ratio. In **Auto 4:3 mode** the SD outputs can be set to be always 4:3, in which case it will down convert and perform either a Letterbox or centre cut, depending on the source material. In **Auto Adaptive mode,** if the HD input is 16:9 full frame the picture is down converted with no aspect ratio conversion and is output as 16:9 SD. If the SMPTE 2016 data indicates that the HD input is a 16:9 Pillarbox, however, a centre cut is performed and the output is 4:3 SD.

Although it would normally be a requirement for an automatic system to label all the 3Gb/s or HD video images to show their format and control the down converter, with **Wallbox Q-Down** it is only necessary to label those that are not full frame 16:9 images. When the input is not labelled the down converter uses its default assumption that an HD image is a full frame 16:9. It is therefore possible to have a powerful system with the majority of signals not containing SMPTE 2016 information.

6.1 Fixed Aspect Ratios

There are four fixed aspect ratios which are Anamorphic, 16:9 Letterbox, 14:9 Letterbox and Centre Cut. Anamorphic will map the input picture directly to the native aspect ratio of the viewing display along with the resulting distortion associated with this. Should it be necessary to view the output on a 4:3 display, setting the aspect ratio selection to Letterbox will give the correct picture dimensions by adding black bars to the top and bottom of the picture. Selecting 14:9 Letterbox will crop the picture to 87.5%, and depending on the aspect ratio of

the display will either add black bars to the top and bottom or both sides of the picture. There will be some loss of picture. Centre cut will show the central 75% of the 16:9 widescreen picture mapped to the full monitor height with the corresponding loss of the left and right picture edges.

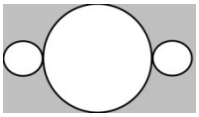
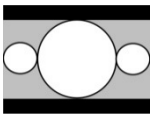
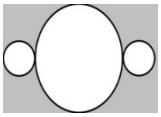
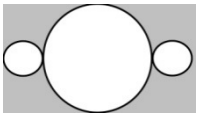
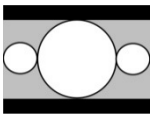
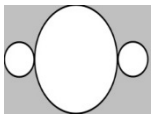
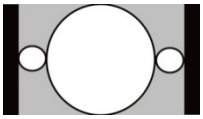
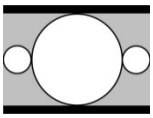
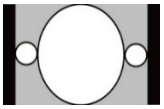
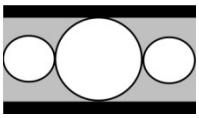
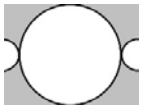
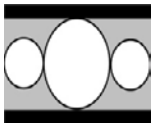
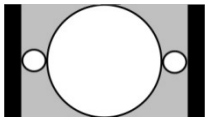
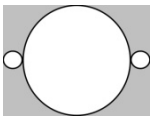
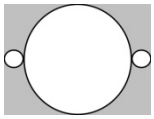
6.2 Automatic Aspect Ratio Selection

There are three auto modes available. When any of these is selected the actual aspect ratio selected will depend on the input video AFD. The AFD reader will also automatically set the output WSS when Widescreen Signalling is set to auto. Selecting Auto 16:9 for all AFD input codes will give an anamorphic aspect ratio conversion and for a 625-line output, WSS will be set to 16:9 full frame. When set to Auto 4:3 the output aspect ratio and WSS data will depend on the input AFD. Undefined/reserved and full frame codes will produce a Letterbox aspect ratio with the output WSS set to 16:9 Letterbox. Pillarbox 4:3, Pillarbox 14:9 and Letterbox greater than 16:9 will give a centre cut conversion and set output WSS to full format 4:3. Selecting Auto Adaptive for any full frame input will give an anamorphic aspect ratio with WSS set to full frame 16:9. Pillarbox 4:3 will give a centre cut conversion and set output WSS to full format 4:3. Undefined/reserved, Pillarbox 14:9 and Letterbox greater than 16:9 will make no change so the previous conversion will remain. On power up the default conversion will be Anamorphic.

Incoming AFD value	Explanation	Auto 16:9 Conversion (output WSS)	Auto 4:3 conversion (output WSS)	Auto adaptive Conversion (output WSS)
0, 1, 5, 6, 7, 12	Undefined/reserved	Anamorphic (full format 16:9)	Letterbox (box 16:9 centre)	No change, as previous
2, 8, 10, 14, 15	Full frame	Anamorphic (full format 16:9)	Letterbox (box 16:9 centre)	Anamorphic (full format 16:9)
9, 13	Pillarbox 4:3	Anamorphic (full format 16:9)	Centre cut (full format 4:3)	Centre cut (full format 4:3)
3, 11	Pillarbox 14:9	Anamorphic (full format 16:9)	Letterbox (box 14:9 centre)	No change, as previous
4	Letterbox>16:9	Anamorphic (full format 16:9)	Centre cut (full format 4:3)	No change, as previous

Response to SMPTE 2016 AFD codes

Note: Widescreen Signalling must be set to Auto for the output WSS to be automatically set by the incoming AFD data. These controls are disabled when the input is standard definition.

SMPTE 2016 AFD Code	Explanation and 16:9 input image example	Auto 4:3 correction (output WSS)	Auto adaptive correction (output WSS)
0, 1, 5, 6, 7, 12	 Undefined/reserved	 Letterbox 16:9 into 4:3	 Anamorphic
2,8,10,14,15	 Full frame 16:9	 Letterbox 16:9 into 4:3	 Anamorphic
3,11	 14:9 Pillarbox	 Letterbox 14:9 area into 4:3	 Anamorphic
4	 Letterbox image with aspect ratio > 16:9.	 Centre cut into 4:3	 Anamorphic
9,13	 4:3 Pillarbox in 16:9 frame.	 Centre cut-area	 Centre cut-out 4:3 area

Examples of Auto 4:3 and Auto Adaptive aspect ratio correction

7 Output AFD and WSS

There are three sets of controls associated with Active Format Descriptor (AFD). These are the inserter mode control, entire image aspect ratio selector (coded frame) and the group of 16 AFD codes.

The ANC data packets containing the AFD information are inserted within the active line portion of the fourth line after the switching line in the vertical ancillary space line.

The 16 available codes are described in the following table:

AFD code	Description	AFD code	Description
0	Undefined	8	Full Frame (as coded frame)
1	Reserved	9	4:3 Centre
2	16:9 Centre	10	16:9 Centre
3	14:9 Centre	11	16:9 Centre
4	16:9+	12	Reserved
5	Reserved	13	4:3 with shoot and protect 14:9 centre
6	Reserved	14	16:9 with shoot and protect 14:9 centre
7	Reserved	15	16:9 with shoot and protect 4:3 centre

Note: When inserting SMPTE 2016 data the inserter will blank any incoming SMPTE 2016 data.

7.1 Widescreen Signalling

Output widescreen signalling can be set to automatically follow the input AFD data or be manually selected. If WSS data should be present on the input video this can either be passed to the output unchanged or substituted for a user selected code. WSS data can also be set to be blanked.

Outgoing WWS codes	Explanation	Conversion
0001	Full format 4:3	Centre cut
1000	Box 14:9 centre	Letterbox
1101	Box 16:9 centre	Letterbox
1110	Full format 16:9	Anamorphic

8 Specification

General

Dimensions	Height 44.5mm (1U), width 439mm, depth 200mm.
Weight	2.75kg.
Power consumption	30 Watts.
Power input	90-264VAC, 47-63Hz.
PSU	Includes one 80 Watt power supply, with processor to report the PSU status and Wallbox fan status.

Inputs

Video	One 3Gb/s or HD or SD fibre input per channel with reclocking. 270Mb/s or 1.5Gb/s or 3Gb/s serial compliant to EBU 3267-E, SMPTE 259M, SMPTE 292M and SMPTE 424M. Fibre inputs meet the SMPTE 297-2006 short-haul specification, allowing operation with single-mode and multi-mode fibre. Connector type: Dual LC. Optical wavelength: 1260-1620nm. Input level maximum: -1dBm. Input level minimum: Typical -20dBm (-18dBm 3Gb/s pathological).
Video standards supported	1080p 50/59.94/60, 1080i 50/59.94/60, 720p 50/59.94/60, PAL, NTSC. Input format auto selected.

Outputs

	Outputs are accessed via the ten BNCs on the front of the wallbox (five BNCs per channel). Per channel: two equalised and reclocked loop-throughs of the 3Gb/s, HD or SD input, plus two down converted SDI digital outputs and one down converted PAL/NTSC analogue output. Output frame rate same as input frame rate. Setting the digital output to a higher format than the input will be flagged as incompatible and the output will be replaced with black, blue or muted as selected in the output incompatibility mode menu. Composite: SD only. 1 Volt +/- 2% with syncs into 75 ohm. Selectable setup and Betacam levels. Digital: HD or SD SDI 270Mb/s to 1.5Gb/s serial digital compliant to EBU 3267-E, SMPTE-259M and SMPTE-292M.
Delay through board	Adjustable. Minimum delay 2us with SD input in bypass mode or 16 lines with an HD input.

Composite performance (SD only)

Processing:	Sampling: Video input is 10 bit processed for 12 bit output DACs.
Frequency response:	Luminance: +/- 0.3dB to 5 MHz. Chrominance: +/- 0.4dB to 2.5 MHz.
Noise:	< -67dB weighted luminance or chrominance.
Differential gain:	< 2% typ.
Differential phase:	± 1° typ.

Status monitoring

LEDs	Front panel LED indication: PSU rails present. Video input 1 and 2 present. Over-temperature. Fan speed Ok.

GPI inputs

Number and type:	None.

GPI outputs

Number and type:	None.

Input fail output

Type:	Black, Blue, Mute.

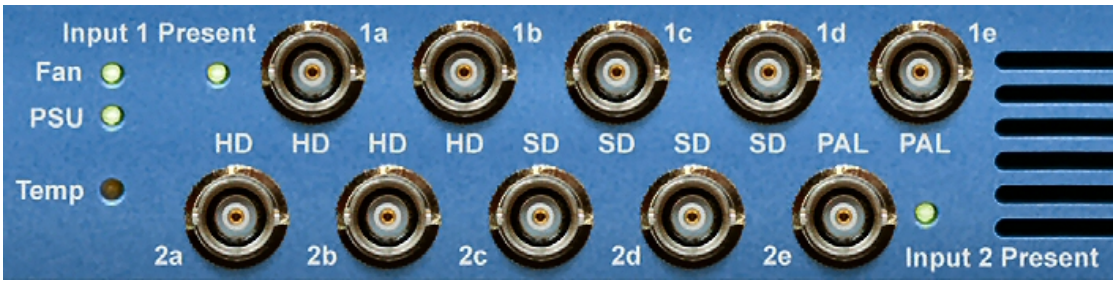
Down conversions

1080p50 to 625/50.
1080p59.94 to 525/59.94.
720p50 to 625/50.
720p59.94 to 525/59.94.
1080i50 to 625/50.
1080i59.94 to 525/59.94.

9 Troubleshooting

9.1 Front panel LEDs

The LEDs on the front panel provide useful power rail monitoring, input video status, fan and temperature monitoring.



Wallbox Q-Down front panel close-up

The following table summarises the front panel LED functions and colours:

Name	LED Colour	Function
PSU	Green	Good power supply (PSU) rails.
	Red	The power supply voltage is out of specification. Replace immediately.
Fan	Green	Normal operation.
	Red	Fan speed low, replace immediately.
Temp	Green	Normal operation.
	Red	Wallbox overheating! Check that fan inlet and outlets are not blocked.
Input Present	Green	Valid signal detected at the fibre video input.
	Off	No input signal detected.

9.2 Maintenance

Warning: **These servicing instructions must only be carried out qualified personnel only. To reduce risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.**
Refer also to the general safely summary in the installation chapter.

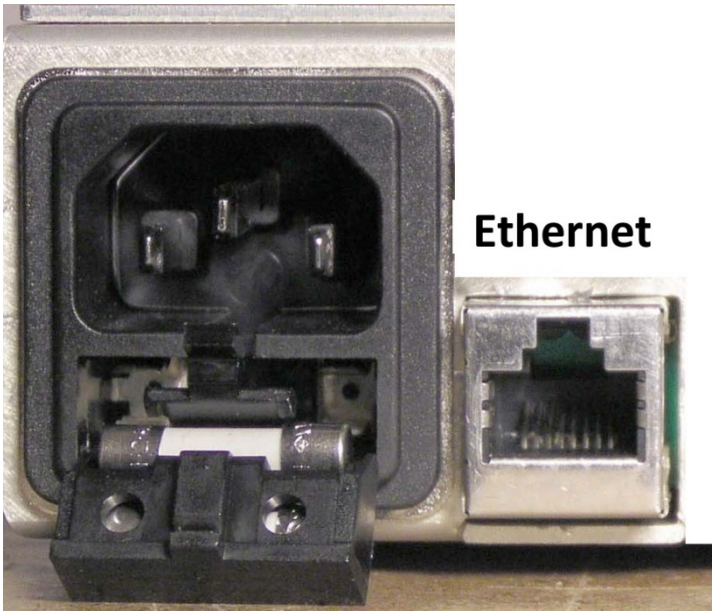
Note: **There are no user adjustments inside the Wallbox Q-Down. In the event of equipment failure, it will be necessary to contact Crystal Vision for detailed instruction on how to dismantle the case to replace faulty parts.**

Replacing the mains input fuses

The mains input fuse is fitted inside the IEC 320 connector at the rear of the unit. A spare fuse is also stored inside the connector. The fuse can only be accessed when the power cord is disconnected.

The sequence is as follows:

- Disconnect the power cord from the rear of the frame
- Using a flat bladed screwdriver or similar tool gently lever out the fuse drawer from the IEC connector using the tab visible at the bottom of the connector depression
- Remove the defective fuse and replace with either the spare fuse or with a 3A, 250V time delay fuse
- Replace the fuse drawer and reconnect the power cord



Rear connectors showing IEC mains input and fuse tray with main and spare fuses

If a fuse blows repeatedly this indicates a fault either in the power supply module or elsewhere. Return the frame and/or power supply to the manufacturer or dealer for repair.

Note: Replace the fuse only with one of the same type and rating (3A, 250V time delay).

Software upgrades

Software upgrades for the **Wallbox Q-Down** are done via the Ethernet connection. See section Software Upgrade. This should only be undertaken when requested by Crystal Vision.

9.3 Fault finding

No video output:

Check that there is a valid fibre input and that the Input LED is green.

Check that the fibre input enable control has not been disabled.

Check that the SDI output format and analogue output format controls have not been changed from ‘SD’ and ‘CVBS’.

No front panel LEDs illuminated:

Check that the frame is powered and that the fuse is intact.

Check that the frame PSU is functioning and replace if necessary (contact Crystal Vision for assistance).

Check that the panel is cabled correctly (contact Crystal Vision for assistance).

Temp LED is red:

Check that cool air is able to circulate through the front panel grilles and out of the ventilation holes at the front of the wallbox.

Check that the panel and PSU fans are operational and that the FAN LED is not red.

Fan LED is red:

Check that the fan is plugged in correctly.

Try replacing the fan (contact Crystal Vision for assistance).

Wallbox Q-Down does not appear in the available cards list:

Some cards take longer than others to finish their initialisation routines - try waiting at least 30 seconds for all cards to initialise.

Unable to connect via Ethernet:

Ensure that PC LAN controller is in the same IP group as the wallbox.

Run cmd/ipconfig to ensure PC IP address is correct.

Use ‘ping’ to try connection.

Disconnect network and try a single wallbox to PC connection.

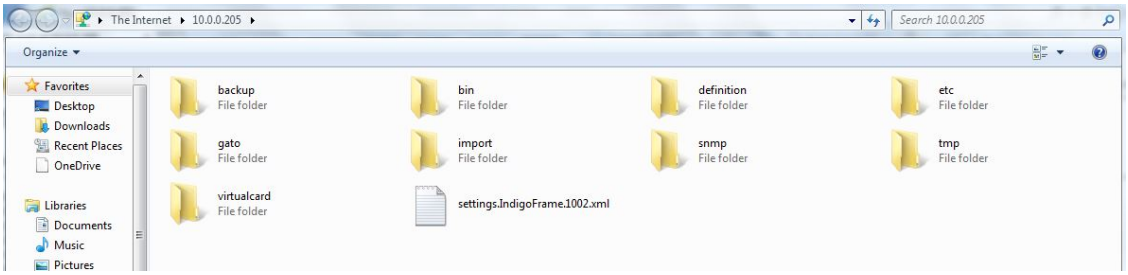
Wallbox IP address forgotten:

Contact Crystal Vision who will give instructions on how to reset IP address to 10.0.0.201.

10 Wallbox memory

10.1 File Structure

Wallbox Q-Down has backup memory located in the Front Panel Processor and is accessible via FTP. The file structure consists of a number of folders all of which contain files for different aspects of wallbox control. For example, some folders contain the files created by automatic backup of card's settings, others contain files for manual restoration of a card's settings. To access a frame via FTP with Internet Explorer type: ftp:// followed by the wallbox IP address i.e. ftp://10.0.0.205. Files can be copied to and from a PC folder via FTP.



Typical FTP file structure as viewed by Internet Explorer

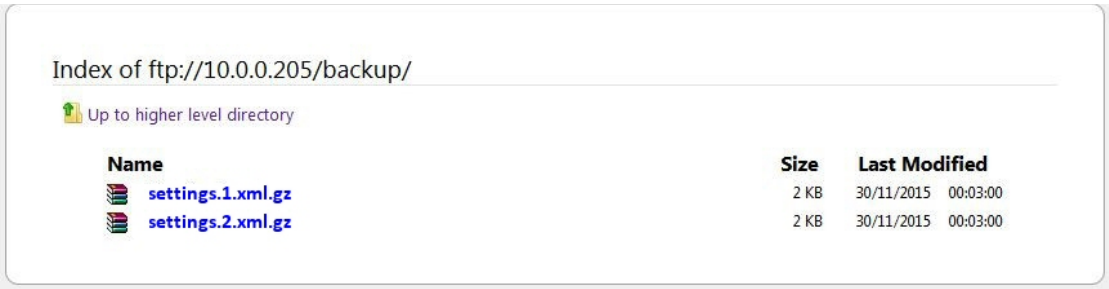
Folder (or file)	Function
backup	**Contains each slot's automatic backup files.**
bin	**No user content.**
definition	**No user content.**
etc	**Contains files for password protection.**
gato	**No user content.**
Import	**Contains settings files for manual restoration.**
snmp	**Contains the files for SNMP configuration.**
tmp	**No user content.**
virtualcard	**Contains virtual card's xml definition files.**
settings.frame.1004.xml	**File containing automatic backup of wallbox settings.**

trace.log	**No user content.**

10.2 Cards

The wallbox Front Panel Processor automatically backs up every card's settings whenever they are changed. These values can be restored automatically or manually as required – *see section VisionWeb Setup Pages for more details.*

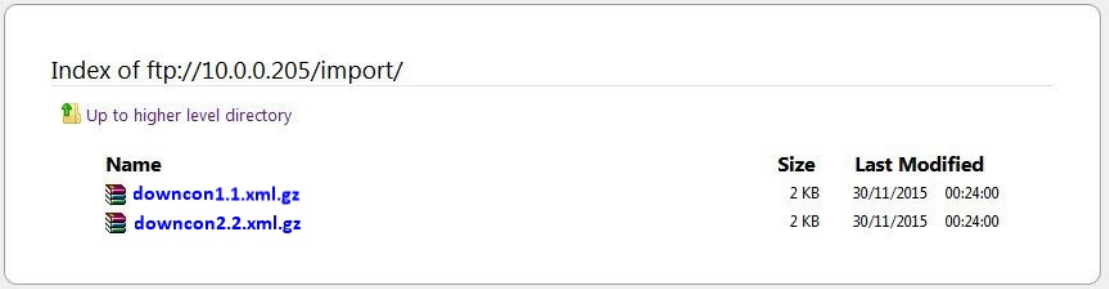
The settings files for automatic backups are stored on a slot by slot basis and have filenames 'settings.N.xml.gz' where 'N' is the slot number. These files are stored in a folder 'backup' which is accessible by FTP:



Typical contents of 'backup' folder showing settings for slots 1 and 2

If the 'Auto Restore' option is enabled then these files are automatically resent to the card in the slot on power up, reset and when a card is re-inserted.

With an FTP connection from a PC it is possible to copy these files, rename them if necessary, to make them more relevant, and use them for the manual restore operation. Settings files for manual restoration are stored in the folder 'import':



Typical contents of 'import' folder showing renamed settings files for two slots

Currently, files cannot be 'drag and dropped' from the backup folder to the import folder but must be copied into a PC local folder first. The transferred file can be renamed to something more relevant to its function. Manual restore gives the option of using a single settings file from the import folder to be sent to one or more slots. This is particularly useful for initial setting up of multiple cards which need to be configured identically as only one need be configured and then applied to the others. When copying any settings via FTP the frame will require a reboot in order for the new settings to take effect.

10.3 Wallbox

The wallbox front panel processor automatically creates a backup file whenever its configuration is changed such as network or slot labelling.

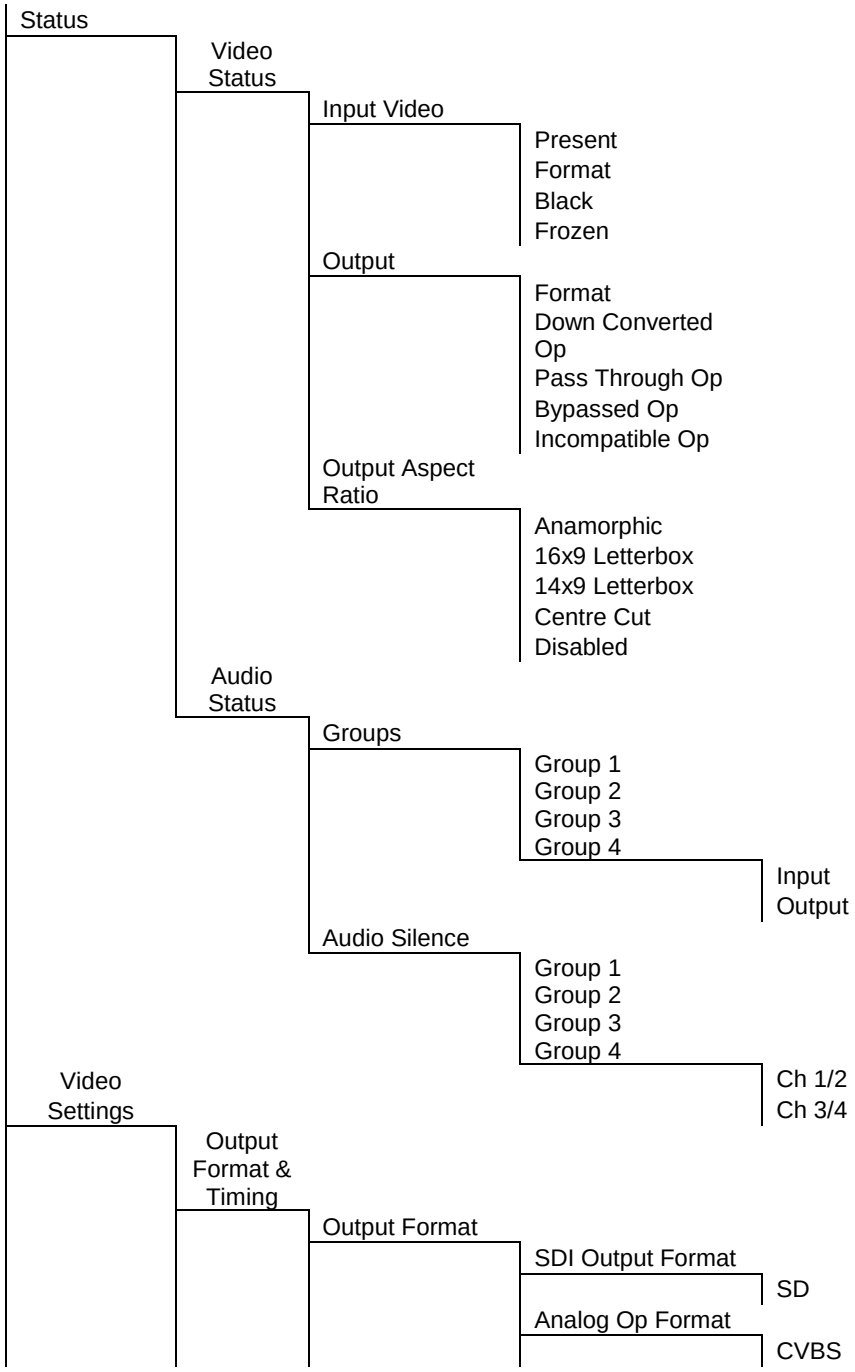
The backup file for the wallbox is in the root directory and is labelled ‘settings.Indigoframe.1004.xml’. The filename may change according to the firmware fitted but will be of that form. It is worthwhile copying this file onto a PC in case the front panel processor is replaced then the file can be copied back to restore previous settings.

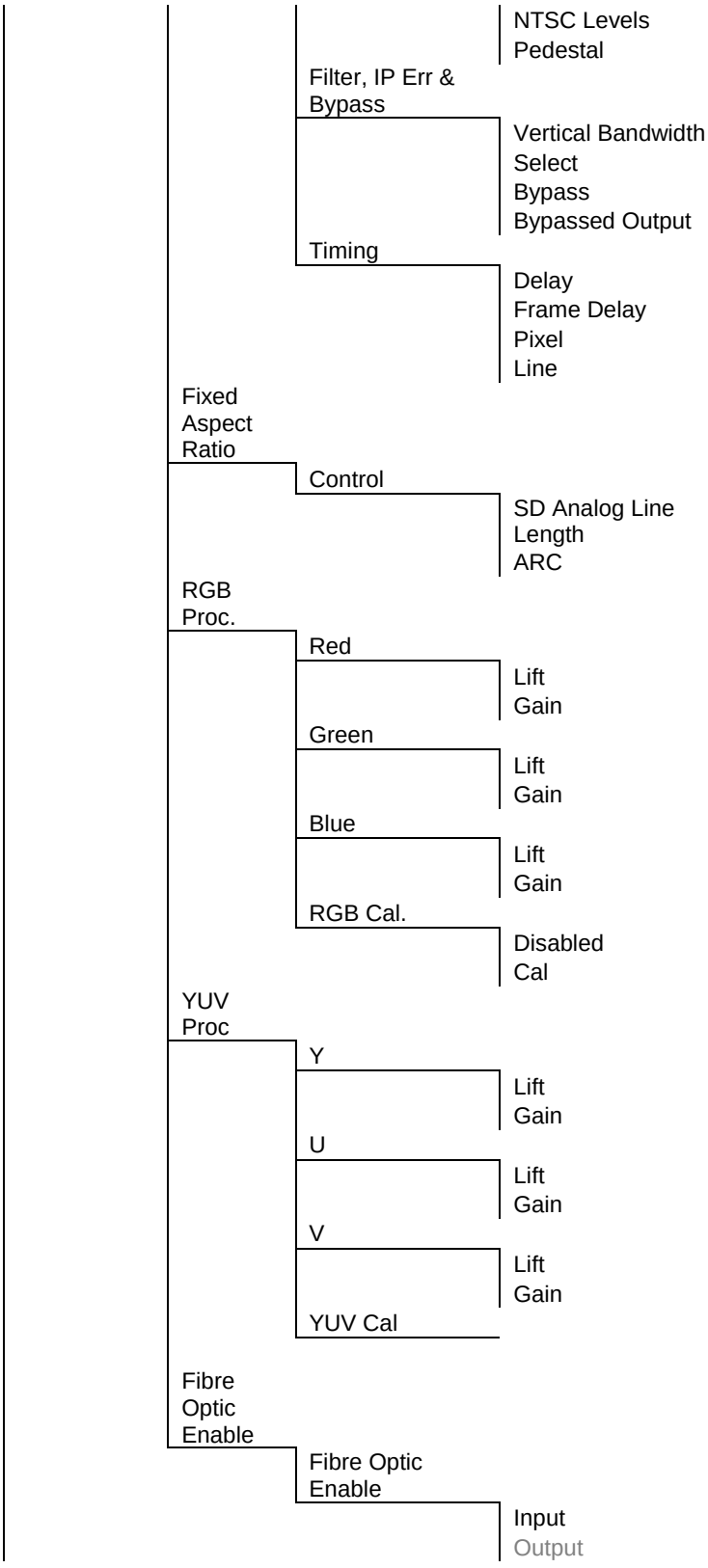
When copying any settings via FTP the wallbox will require a reboot in order for the new settings to take effect.

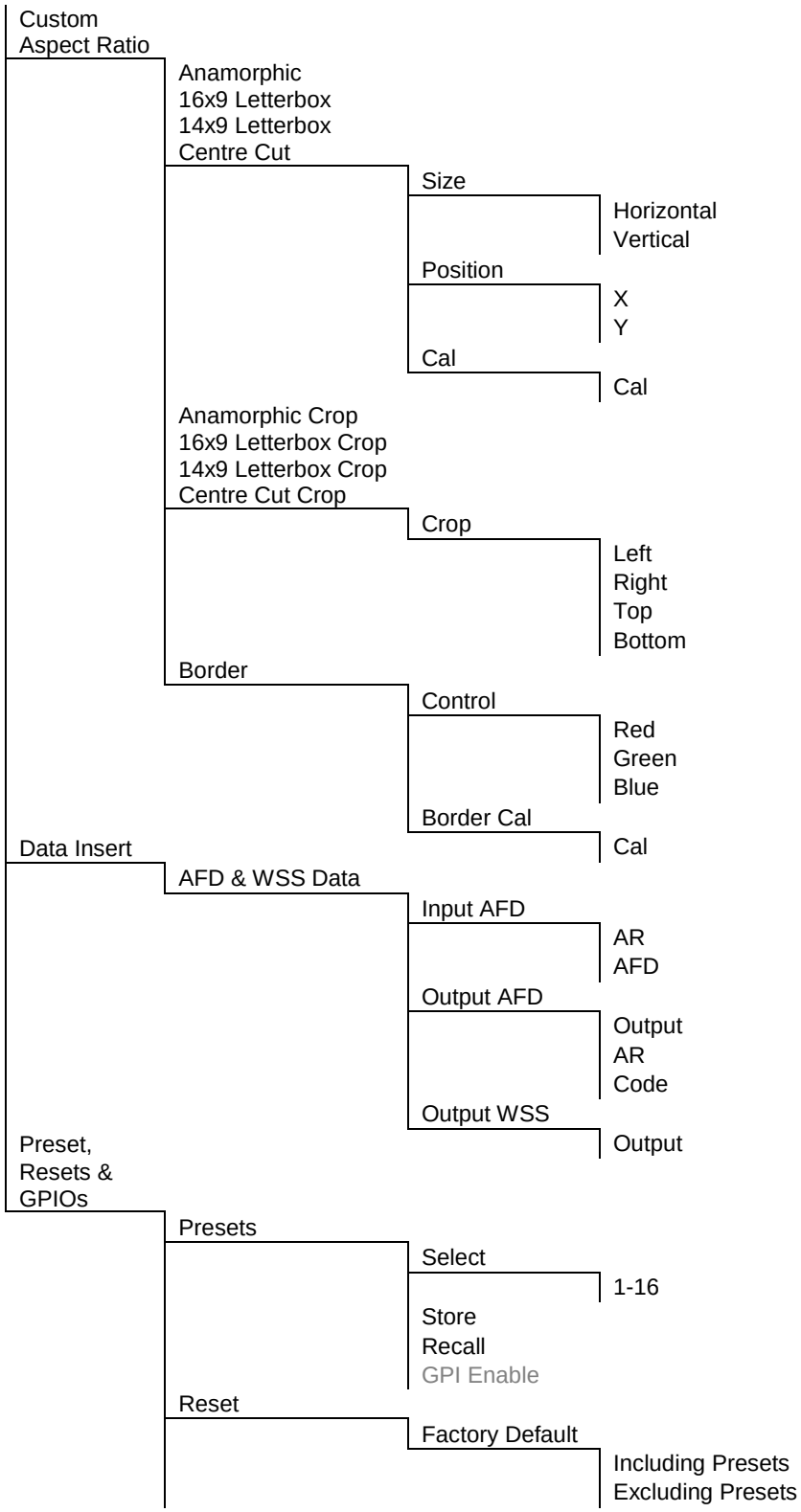
11 Appendix 1

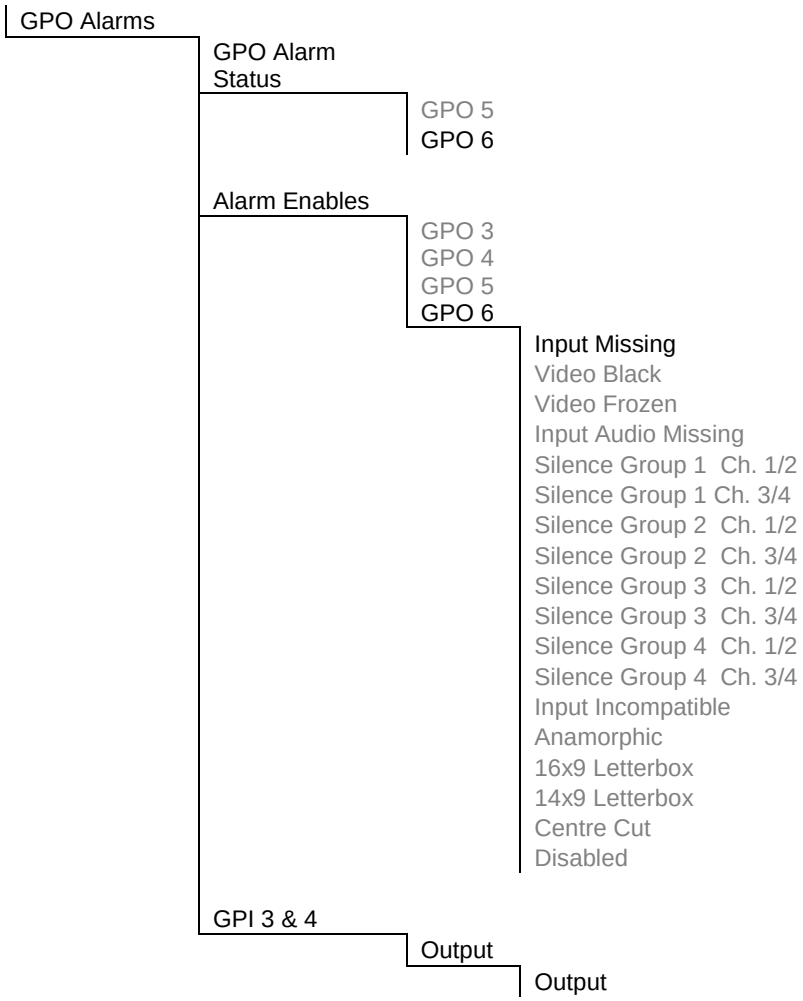
11.1 Menu Tree

The basic menu structure for remote control of **Wallbox Q-Down** consists of the following menus and sub-menus.




NTSC Levels
Pedestal
Filter, IP Err & Bypass
Vertical Bandwidth
Select
Bypass
Bypassed Output
Timing
Delay
Frame Delay
Pixel
Line
Fixed Aspect Ratio
Control
SD Analog Line Length
ARC
RGB Proc.
Red
Lift
Gain
Green
Lift
Gain
Blue
Lift
Gain
RGB Cal.
Disabled
Cal
YUV Proc
Y
Lift
Gain
U
Lift
Gain
V
Lift
Gain
YUV Cal
Fibre Optic Enable
Fibre Optic Enable
Input
Output


Custom Aspect Ratio
Anamorphic
16x9 Letterbox
14x9 Letterbox
Centre Cut
Size
Horizontal
Vertical
Position
X
Y
Cal
Cal
Anamorphic Crop
16x9 Letterbox Crop
14x9 Letterbox Crop
Centre Cut Crop
Crop
Left
Right
Top
Bottom
Border
Control
Red
Green
Blue
Border Cal
Cal
Data Insert
AFD & WSS Data
Input AFD
AR
AFD
Output AFD
Output
AR
Code
Output WSS
Output
Preset, Resets & GPIOs
Presets
Select
1-16
Store
Recall
GPI Enable
Reset
Factory Default
Including Presets
Excluding Presets



The above menu structure is the path to access the various **Wallbox Q-Down** controls and status. Note: Controls shown in grey are non-functional.