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Kinesys Vector Software

Operating Manual
[ORIGINAL]

An automation software application

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1. Introduction

Kinesys Vector Software is a fully featured motion control sequencing system capable of controlling both fixed and variable speed devices. It incorporates cue editing and running functions for ease of use during a show. It also incorporates Manual mode that allows movement of individual or grouped devices.

Channels can be defined with default settings, software limits, unique names and drive configuration settings. This allows the system to accurately control devices within a short period of time, which is essential for shows or applications where lots of devices rely on the motion system being readily available.

Cues can be created with flexible functions including staggered starts and time-priority running. This allows advanced cues to be created without the need for multi-level cue sequences or separate timers. When cue sequences are required, they can be set up quickly using linking functions that allow cues to start on the completion of other cues, the positions of other devices, and with time delays and looping facilities if required.

The inclusion of presets and profiles allows global positions and global movement settings to be defined. Once defined, adjusting the settings of many moves and cues can be achieved by adjusting the settings of the relevant preset or profile and then that change will be implemented throughout the entire show.

Vector uses the concept of grouping. This allows several channels to be controlled as if they were one. This makes it quick and simple to select and move multiple channels at once. Grouping also means that if a fault develops in one channel, the entire group can be stopped.

Another key feature of the system is Simulation mode, which allows cues to be created and run offline. This allows for the safe testing of complex linked cue sequences and channel interaction and avoids potentially dangerous clashes between devices to be identified before anything is moved physically.

The graphical user interface utilises a familiar Windows interface to minimise the learning curve for new users and features moveable graphics windows to allow the customisation of the layout to whatever configuration users may find most ergonomic and user-friendly.

Vector runs on a standard Windows PC or laptop, as well as the Vector Console. For more details on the operation of the Vector Console, refer to the Vector Console operating manual (Document # 9200242).

2. Safety information

IF IN DOUBT ABOUT ANY ASPECT OF MOVING OBJECTS, ALWAYS SEEK PROFESSIONAL ADVICE BEFORE OPERATION.

Make sure this Operating Manual is always kept in a complete and fully readable condition and that it is always accessible to all operators of the software.

Safety warnings

- **Do a full risk assessment of the location where Vector and its connected devices will be used.**
- **Do not start movement operations until a qualified person has inspected the connected equipment, and confirmed that is in 100% working order.**
- **The functions within the Vector should not be relied upon as the sole means of stopping motion. Software-independent means of stopping movement must be provided, including a hardware emergency stop system that is compliant with all local regulations.**
- **Make sure all machine stop buttons, emergency stop buttons and enabling switches in the system have been tested and are functioning correctly.**
- **If you notice any unexpected or dangerous movements, use the emergency stop button/s on the connected devices to bring all movement to an immediate stop. Alternatively, release the enabling switch.**
- **Make sure all operators know the locations of the machine stop buttons, emergency stop buttons and enabling switches in the system.**
- **Make sure all attached loads are unobstructed and will not come into contact with other static or moving objects during movement.**
- **Make sure all attached loads are always visible to the operator where possible. If this is not possible, make sure the operator has reliable communication with a person who can clearly see the attached loads.**
- **Make sure all persons in the hazard zone underneath the lifting equipment are aware of the potential for movement.**

3. Setup and installation

If Vector has not been installed by the supplier, then it must be installed to the relevant laptop or PC manually. Installation is straightforward and uses a standard Windows setup program. If operating on a Vector Console, the software will be built into the console itself and there is no need for manual setup.

When the program starts for the first time, a licensing screen will appear. On the right side of the screen, a number shows the days remaining before the software will cease to operate without a correct unlock code being entered.

The license screen also displays the license code and a box underneath to enter an unlock code. This box will appear every time the program starts until the correct unlock code is entered. If you do not wish to enter the unlock code and there are days remaining, then you can click OK to start running the software.

To obtain the unlock code, contact support@taittowers.com or the company that supplied the software and quote the license code displayed on screen. The unlock code must then be entered in the box before clicking OK. Once the correct unlock code has been entered, a message will appear on screen saying that the software is now licensed. Note that the unlock code provided will be specific to the original machine where the software was installed; installing the software on further machines will require the purchase of additional licenses.

3.1 Software modes

Vector can be licensed in three modes as follows.

Demo mode: In Demo mode, Vector will always be in Simulation mode and communication with connected devices will not be possible. Simulation mode is indicated by the background colour of each channel status turning yellow.

Workshop mode: In Workshop mode, Vector can communicate with connected devices in Manual mode but when a cue is selected, the software will switch to Simulation mode. This mode is designed to be used in workshops to test and configure equipment. It is not intended to be used to fully run shows.

Full mode: In Full mode, Vector will run without restrictions.

3.2 Logging in

Before using Vector, you must log in to the software using the Login screen. This is to ensure unauthorized personnel do not access the system and to provide different levels of access to different users. The Login screen will look slightly different on the Vector Console as there will be an RFID logo. This means that the RFID key card can be used as an alternative method of login. For more details, refer to the Vector Console manual.

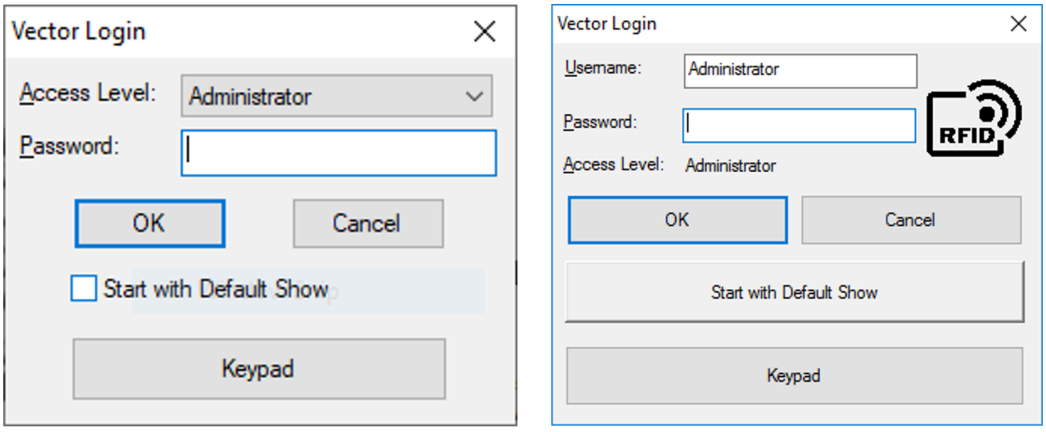


Figure 1. Login screen for standard software (left) and Vector Console (right)

There are three different user access levels: Operator, Programmer and Administrator.

Administrator: Administrators have permission to control all aspects of the system including adding, deleting and editing users and their passwords.

Programmer: Programmers have permission to edit and run cues. By default, they can also edit some aspects of the channel properties. They cannot change their password or their own permissions.

Operator: Operators have similar permissions to Programmers. By default, they can only run cues but cannot edit them. They cannot change their password or their own permissions.

3.2.1 Default show

Selecting "Start with Default Show" on the Login screen will bring up a blank show file that contains one empty cue and empty channel row as a starting point. If this option is not selected, Vector will open the last saved show file.

3.2.2 Default passwords

When the program is first installed, default usernames and passwords are set up for the three user access levels. The default username is the name of the user access level with a capitalised first letter. The default password is the same as the username but with a lower-case starting letter.

Default username	Default password
Administrator	administrator
Programmer	programmer
Operator	operator

It is strongly recommended that you change these passwords as soon as possible to maintain security, which can only be done by administrators in the Access & Security tab of the Options menu within "Tools".

If passwords for operators or programmers have been forgotten, they can be viewed in plain text by administrators.

3.3 Configuring the network

The computer that is running Vector must have an Ethernet network adapter set up for a fixed IP address in the range 192.168.18.x where "x" is the specific address of the computer. The IP address of the computer must be unique and different from the addresses of all connected devices; it is not possible to have two or more devices in the network with the same IP address. If in doubt, contact support@taittowers.com to determine what the exact IP address of the computer should be.

3.3.1 Setting the Network IP Address of the computer

Note: the following procedure is based on Windows 10. Other versiosn of Windows may appear slightly different.

1. Open the Network and Sharing Centre. This can be found in the Control Panel or by pressing the Windows and R key at the same time and then typing "ncpa.cpl" and pressing Enter.
2. On the left pane, click "Change adapter settings".
3. Right- click the network and select "Properties". Note that this step may need permission from the network administrator.
4. On the Ethernet Properties window, select the "Internet Protocol Version 4 (TCP/IPv4)" option and then click the Properties button.

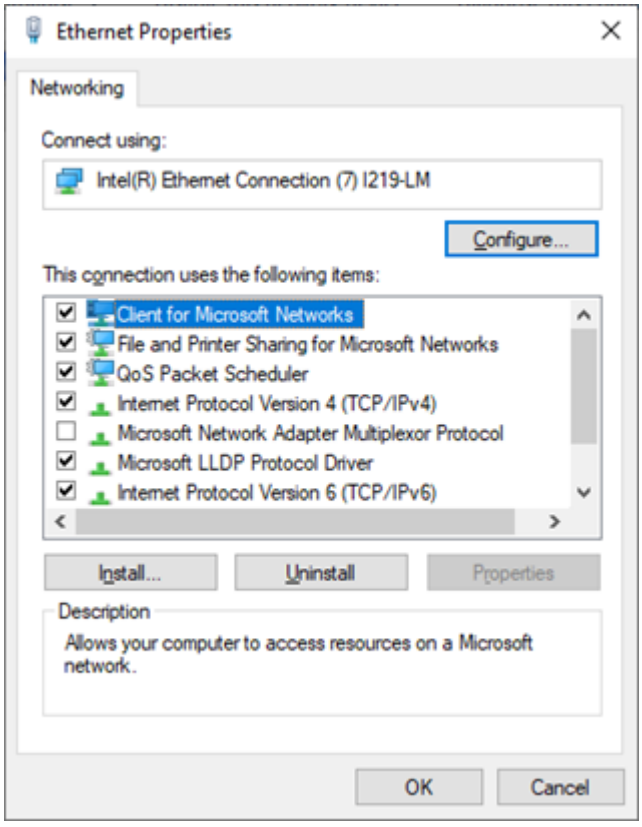


Figure 2. Setting the IP address - Ethernet Properties window

5. Select the "Use the following IP address" option.

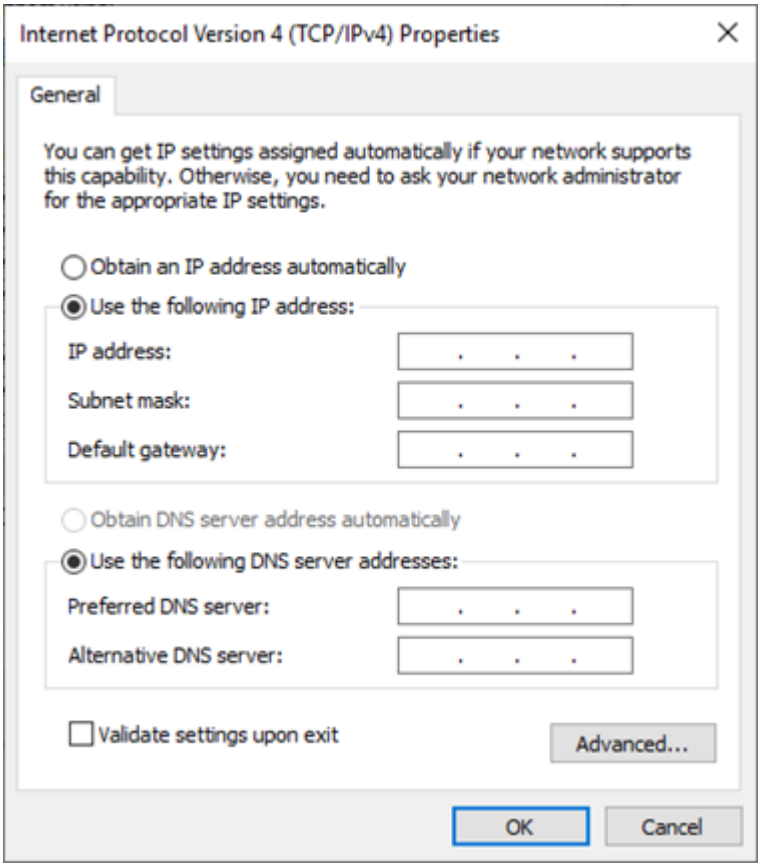


Figure 3. Setting the IP Address - Internet Protocol Version 4 Properties window

6. Enter the new IP address in the format 192.168.18.x, where "x" is the specific address of the computer.
7. Make sure the Subnet mask is set to 255.255.255.0.
8. Do not edit the Default gateway or any other fields on-screen.
9. Click the OK button.

3.3.2 Setting the IP address of connected Kinesys devices

The static IP address range for most Kinesys devices (e.g. Elevation, Libra, Velocity) is 192.168.18.xx (Subnet mask 255.255.255.0).

Apex devices use the range 10.xx.xx.xx (Subnet mask 255.0.0.0).

Note: the following procedure is based on Windows 10. Other versiosn of Windows may appear slightly different.

1. Do steps 1 to 4 in section 3.3.1.
2. Click the "Advanced..." button of the General tab (see Figure 3).
3. On the IP Setting tab click "Add...".

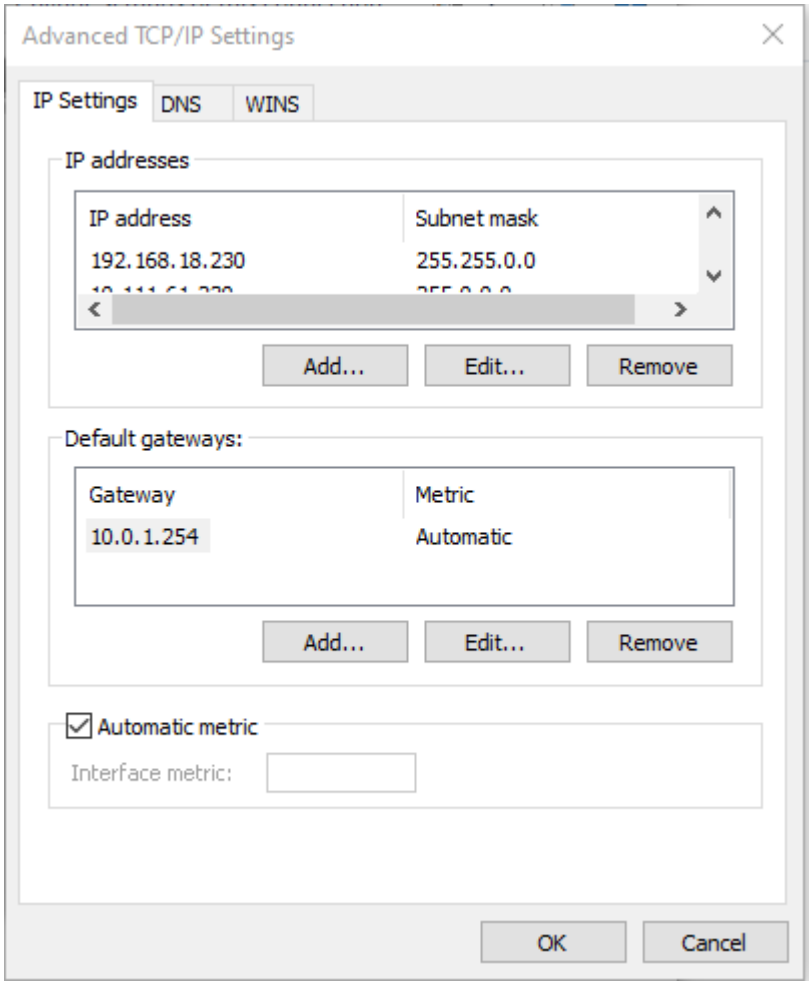


Figure 4. Setting the IP address - Advanced window

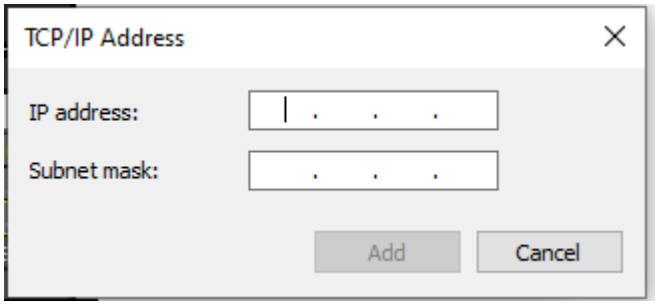


Figure 5. TCP/IP address pop-up window

4. On the TCP/IP Address pop-up window enter the IP address of the Apex device in the form 10.xx.xx.xx. Enter the Subnet mask as 255.0.0.0.
5. Click the OK button.

4. Terminology

Accel

Accel defines the rate that the connected device will accelerate in units of mm/s/s.

Alarm

Alarms are optional features that allow external digital inputs to be monitored for a quick diagnosis of the external switches and sensors. It communicates with external input readers using the communications protocol defined in the Options window.

Channel

A channel represents a single controlled axis. It can be any linear or rotational device that is capable of being moved to a position and of giving positional feedback about its position.

Copy

The copy function stores the information contained in the copied cue into an internal cue clipboard. All the moves stored within the cue will be saved. However, link information is reset so that when it is pasted back into the show it will show as a root cue.

Cue

A cue is a collection of moves. Cues can either be standalone in the case of un-linked root cues or can be part of a larger cue sequence. A show will usually consist of a series of cues grouped together in a specific order.

Cue sequence

Cue sequences are groups of cues that are linked to each other and can be made to loop back to the beginning of the sequence if desired. All cue sequences have one root cue which is the cue that starts off the sequence.

Decel

Decel defines the rate that the object will decelerate at in units of mm/s/s.

Delay

Delay allows individual moves within a cue to be delayed, creating a staggered start when the cue is running. It is displayed and entered in units of seconds but will allow an accuracy of two decimal places to be added.

Group

Groups are sets of channels that can be controlled as if they were one. Once channels are grouped this allows for quick cue creation and manual movement of multiple channels.

Link

Links describe the conditions under which a cue will start. Every cue has a link that defines its trigger characteristics. By default, a cue’s link is to attach it to the root as a standalone

cue and to assign it to the red playback. Changes to a cue's link are done by selecting the cue and then clicking on Link Functions.

Load

Before a cue or cue sequence can be run it must be loaded into a playback. The Load button is used to do this.

Loop

Cue sequences can be set up to loop back to the beginning after certain predefined conditions are met. Loops can be set as continuous, repeat limited or time limited. Only one loop can be used per cue sequence and loops are not possible on standalone cues.

Move

A move describes the motion of a single channel from its start to end position. It defines the target position, the ramp rates and either the speed it must travel at or the time it must take to complete.

Paste

A cue copied to the clipboard can be pasted back into the show, either as a new cue or to replace an existing cue. The cue will be reinserted as a root cue irrespective of the link information it previously contained. It will, however, maintain its original playback colour assignment.

Playback

A playback is the tool that controls the execution of cues. Every cue or cue sequence is assigned to one of four coloured playbacks. Each playback has a start and a stop key assigned to it on the keyboard. A cue must first be loaded into the playback and then it can be started or stopped any time after that. If a cue is stopped in a playback then it must be reloaded before it can be run again. The start key in the playback is also used to control the progress of a cue sequence when certain cues within the sequence are set to load and pause. This requires pressing the start key to run that section of the sequence and allows a sequence to be broken down into manageable sections without the need to stop or start the whole sequence.

Preset

A preset is a global position that can be used instead of manually entering a number when assigning a position to a move. A preset consists of a name and a position. The position can be changed if needed and the corresponding position is then applied to all moves that use that preset name as their target reference.

Profile

Similar to a preset, a profile is a global speed definition that can be used instead of manually entering the acceleration, speed and deceleration when assigning these details to a move. A profile consists of a name, acceleration, speed and a deceleration. These details can be changed if needed and the corresponding fields are then applied to all moves that use that profile name.

Speed

Speed is defined in units of mm/s. It defines the maximum speed that a channel will reach during a move. In some circumstances (e.g. when the start and target positions are very close together) the target speed may not be reached as the device will have to start decelerating before it reaches full speed.

Target

Target is the position that a channel will attempt to reach when a move is executed. It is defined in units of mm and is an absolute position, not a relative position. This means that the direction of travel is dependent on whether the current position is greater or less than the target position.

Time

In some circumstances, it may be desirable for a move to be complete in a set time instead of at a set speed. This is especially useful when the start position of the channel cannot be guaranteed. If a time is defined within a move, then it will take priority over any speed that may have previously been defined.

5. Keyboard shortcuts

Vector is designed to operate with a standard laptop or PC keyboard. All the normal Windows conventions are used for open, save, copy and paste etc. In addition, Vector uses software-specific keyboard shortcuts to enable all move commands to be issued quickly from the keyboard instead of a mouse click. These shortcuts are summarised below.

5.1 Windows commands

New file	Ctrl + N
Open file	Ctrl + O
Save file	Ctrl + S
Exit	Alt + F4
Copy cue	Ctrl + C
Paste cue	Ctrl + V
Paste as new cue	Ctrl + Insert

5.2 Navigation commands

Channel Up	Up arrow
Channel Down	Down arrow
Previous cue	Page Up
Next cue	Page Down
First cue	Home
Last cue	End

5.3 Run commands

All stop	Space bar	Notes
Cue load	F12	Moves the system into Running mode if in Editing mode when pressed.
Red start	F1	
Red stop	F2	
Blue start	F3	
Blue stop	F4	
Green start	F5	
Green stop	F6	
Yellow start	F7	
Yellow stop	F8	
Manual Channel Up	F9	
Manual Channel Down	F10	
Manual Channel stop	F11	
Manual Group Up	Shift + F9	
Manual Group Down	Shift + F10	
Manual Group Stop	Shift + F11	

5.4 Special commands

Dead man's handle (enabling switch)	Ctrl	Press and hold for duration of move.
Manual Channel Up (ignore faults)	Alt + F9	Allows movement even if other channels in the group show faults.
Manual Channel Down (ignore faults)	Alt + F10	
Manual Group Up (ignore faults)	Alt + Shift + F9	
Manual Group Down (ignore faults)	Alt + Shift + F10	

6. Options window

The Options window is accessible from the menu bar under "Tools" and allow options to be set that will affect every show that is loaded into Vector.

6.1 Access & Security

The Access & Security tab allows the administrator to set permissions and change passwords for themselves as well as operators and programmers.

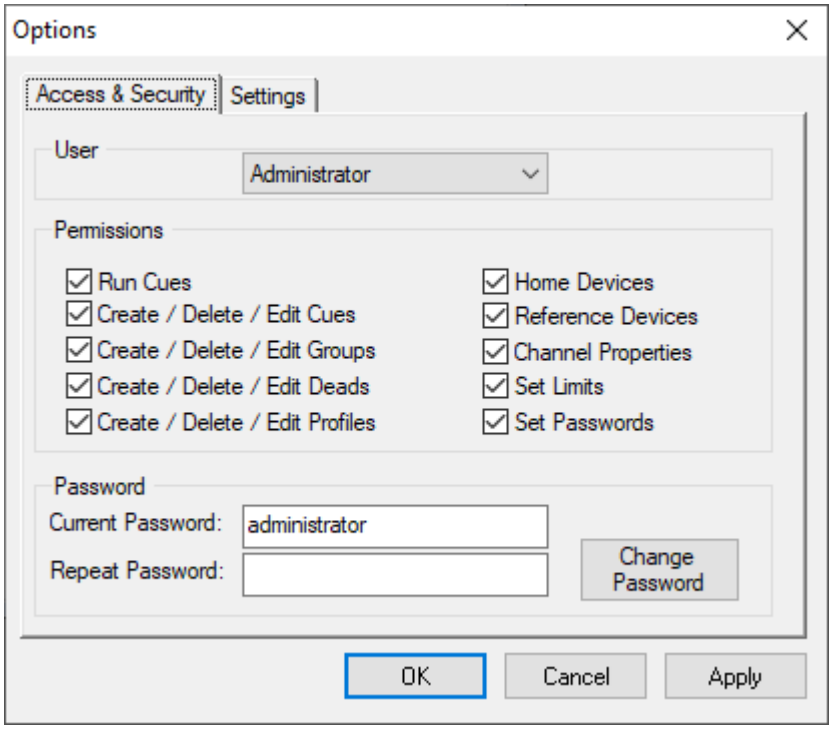


Figure 6. Options - Access & Security tab

User: This drop-down list allows the user to select which login level they wish to review.

Permissions: This is where the permissions for each user level can be altered by the administrator. In the example above, the permissions of the administrator are being reviewed. If these settings are viewed when logged in as operator or programmer they are shown locked out, which means they can be viewed but not altered.

Password: This is where the administrator can change the passwords for all three login levels. This is done by entering the password twice, once in the Current Password field and then again in Repeat Password, and then clicking the Change Password button. All passwords are encrypted before being stored to avoid unauthorised users being able to access the system. Passwords can be removed for login levels if required by leaving the two password fields blank before clicking the Change Password button. A message will appear to confirm this outcome.

6.2 Settings

This tabs changes the global settings in Vector.

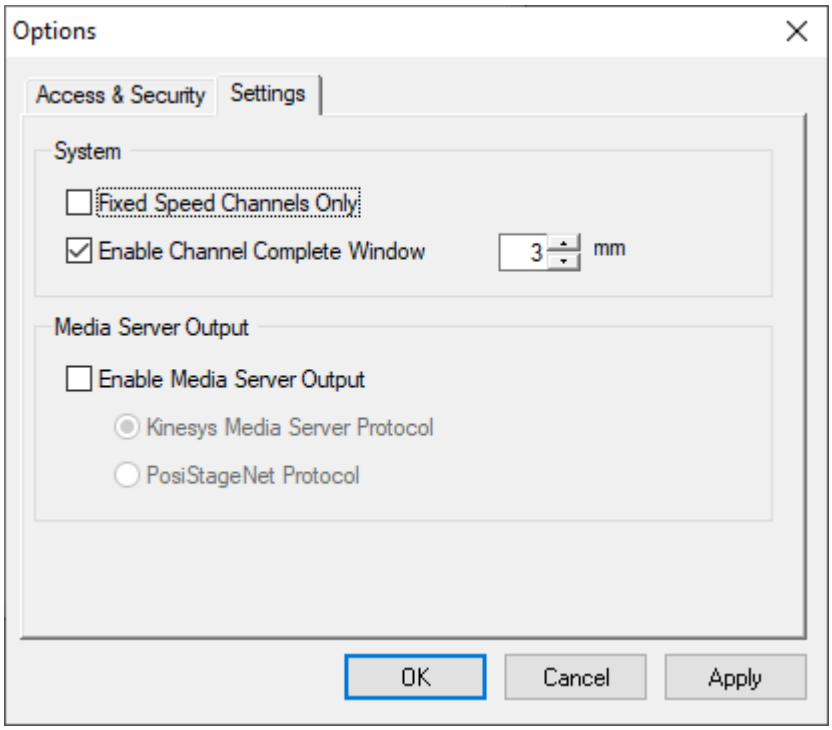


Figure 7. Options - Settings tab

Fixed Speed Channels Only: This option can be selected if fixed speed devices like chain hoists are being controlled. If selected, the Channel View window will not display the Accel, Speed, Decel and Time columns. This option must not be selected if the show contains any variable speed devices.

Enable Channel Complete Window: This option defines the how close in mm a channel needs to get to its target before Vector assumes a move is complete.

Enable Media Server Output: This option allows the system to connect to a dedicated Media protocol, e.g. Kinesys or PosiStageNet.

7. Screen overview

The main screen consists of four core windows: Channel View, Show Overview, Cue Information, and Shortcuts. Each window's name is displayed on the ribbon at the top of the window. These names are used as references throughout this manual.

The core windows are always present on screen and cannot be closed, although they can be resized and moved to a position that suits the user. The window sizes and positions are stored by the software and then restored on startup. The original screen sizes can be reset by selecting "Reset Screen Size & Position" in menu bar under "Windows".

In addition to the four core windows, a number of other windows are available to allow different aspects of the system to be configured and for cues to be created, edited and run. All the main features needed to create shows are accessible from the Shortcuts window.

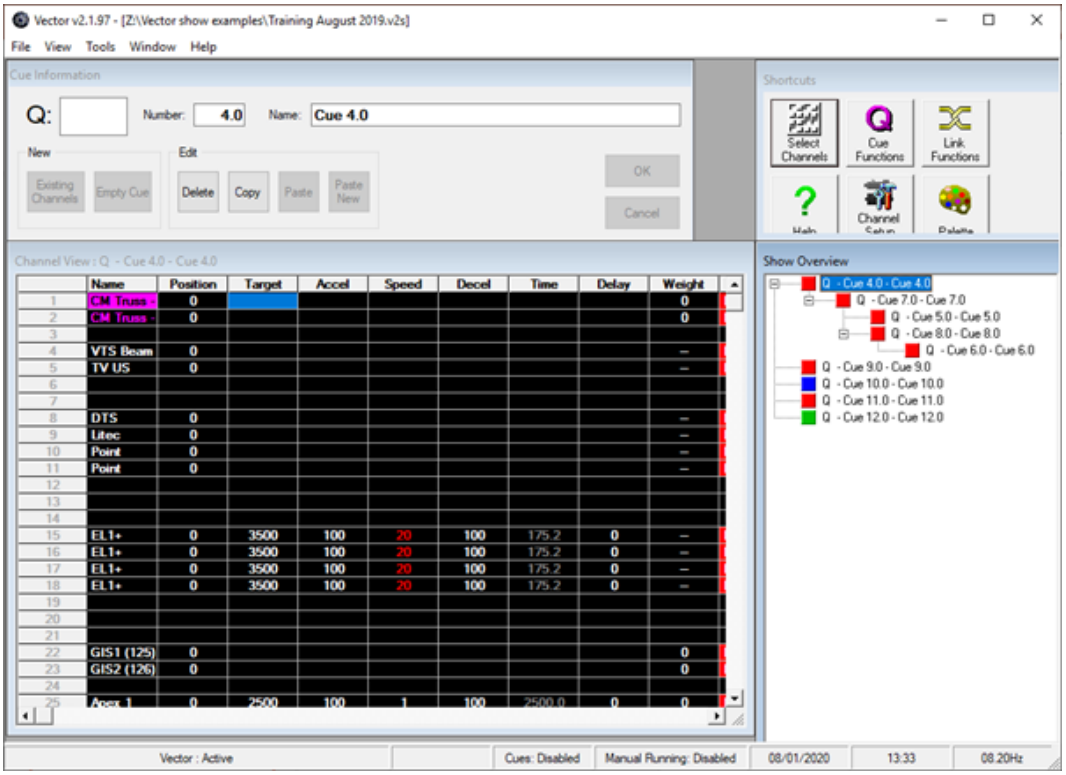


Figure 8. Screen overview

7.1 Show Overview

The Show Overview window displays a list of all the cues currently created in the show file. It shows their cue number, name and also the colour of playback that they have been assigned to. It shows the state of different cues, whether stopped, paused or running. It is also possible for the window to display every move within each cue, which can be useful for getting a more detailed picture of what each cue will do. For more details, refer to section 10.1.

7.2 Cue Information

The Cue Information window contains functions relating to the creation, deletion and editing of cues. The cue that appears in this window is the one that is highlighted in blue in the Show Overview window. For more details, refer to section 10.2.

7.3 Channel View

The Channel View window displays information about a channel's name, position, comms status and any moves that may be contained in the current cue. Channels can be put in any order and can also be arranged to leave gaps in the grid for easy grouping of channels. For more details, refer to section 11.1

7.4 Shortcuts

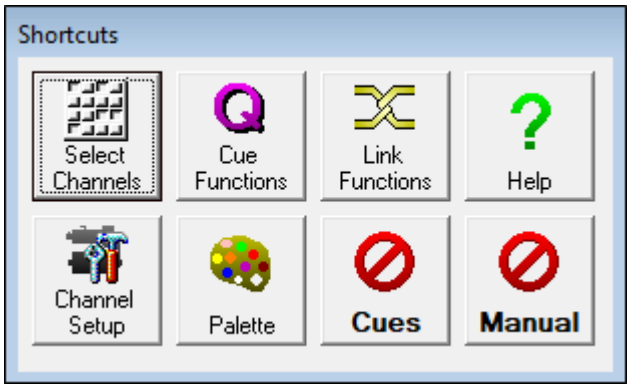


Figure 9. Shortcuts window

The Shortcuts window gives the user quick access to commonly used functions in Vector. Like the other core windows on the main screen it can be re-sized and moved to any part of the screen. Resizing the window causes the buttons to automatically reorder themselves to make best use of the window shape. The Help button gives access to the help guide within the software, which is similar to the content of this manual.

Other buttons in this window are explained in more detailed in the following sections.

- Select Channels - opens the Select window - refer to section 11.2.
- Cue Functions - opens the Cue Information window - refer to section 10.2.
- Link Functions - opens the Edit Link window - refer to section 12.
- Channel Setup - opens the Channel Setup window - refer to section 8.
- Palette - opens the Palette - refer to section 13.
- Manual - toggles Manual mode on/off - refer to section 9.
- Cues - toggles Running mode on/off - refer to section 14.

8. Channel setup

The Channel Setup window contains various properties that can be edited for each channel. Once set up, these will appear in the grid of the Channel View window. The Channel Setup window can be accessed in two ways: either by clicking on the Channel Setup button in the Shortcuts window or by double clicking the Name cell of an existing channel within the Channel View window.

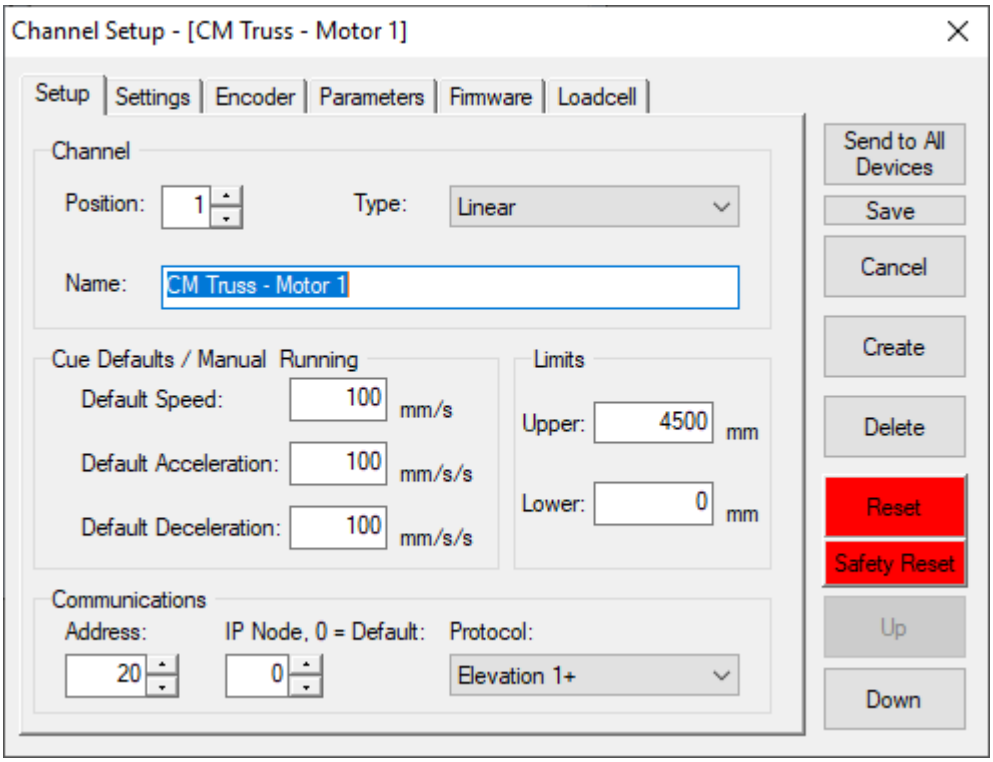


Figure 10. Channel Setup window

Pressing the Page Up and Page Down keys while the Channel Setup window is open will cycle through the channels and allow their properties to be edited. Note that while doing this, the text in the Name field and at the top of the window will change to the current channel name. The number in the Position field will also change as well as the various other parameters in the window.

8.1 Adding channels

To create a new channel, click the Create button on the right side of the Channel Setup window. A new channel will then be added to the grid in the Channel View window and will be assigned the next available whole number. The new channel will contain default settings and be assigned a default name, all of which can be edited within the Setup window.

8.2 Saving channels

To keep the settings and close the Channel Setup window without sending them to the channel's devices, click the Save button on the right. A message box will subsequently appear to confirm this choice. To save and also send the settings to the channel's devices, click the "Send to All Devices" button above the Save button.

8.3 Deleting channels

To delete a channel while the Channel Setup window is open, make sure the correct channel has been selected and then click the Delete button on the right. A message box will appear to confirm the action. Take care when deleting channels as the action is non-reversable and any moves associated with that channel will also be lost.

8.4 Reset buttons

Reset: This button is used for resetting the internal drive (VFD) in the connected controller (e.g. Elevation Drive or Apex Drive).

Safety Reset: This button is applicable to Apex Drive only and is a way of remotely resetting the Safe PLC within the drive.

8.5 Setup tab

8.5.1 Channel

Position: This number tells the software which row to put the channel on within the grid of the Channel View window. It must be a unique whole number and can either be entered as a number into text field or changed using the Up and Down arrows. When a new channel is created, by default the position will be the next available number in the sequence.

Type: This drop-down menu allows either a linear or rotational direction of movement to be specified. For details on rotational movement in Revolve mode refer to section 8.11.

Name: This is a descriptive name for the channel that makes it easy to recognize when selecting channels or when error messages are being reported.

8.5.2 Limits

The limits define the range that a device can travel within. The upper limit is the maximum position that the system will allow the device to travel to. Any move requests to positions greater than this are stopped at this value. The lower limit is the minimum position and requests to positions lower than this are also stopped.

The limit values are downloaded to, and used by, the connected controller for position monitoring and safety.

8.5.3 Communications

Address: This is the communications addressused for communications with the connected controller.

IP Node: For Elevation Drives, this is the IP address of the required Micro Transform. For other products this is the IP address of the connected controller (e.g. Apex Drive). This field specifies the last digit of the IP address, so a value of 6 would equate to an IP address of 192.168.18,6. If the value is 0 then the default value is used for the associated controller. For Micro Transforms, the default value is 51, for smart8 and Elevation24 controllers the default value is 61. Note when the protocol Velocity-Ethernode is selected then the IP address is ignored as the address field is used to define the IP address.

Protocol: This drop-down box contains a list of all the protocols that can be used with the version of Vector stored on the computer. Select the appropriate one for the controller that you are using.

8.6 Settings tab

This tab contains all the settings relating to how the channel moves. It also contains the controls to re-reference a channel (change its current position).

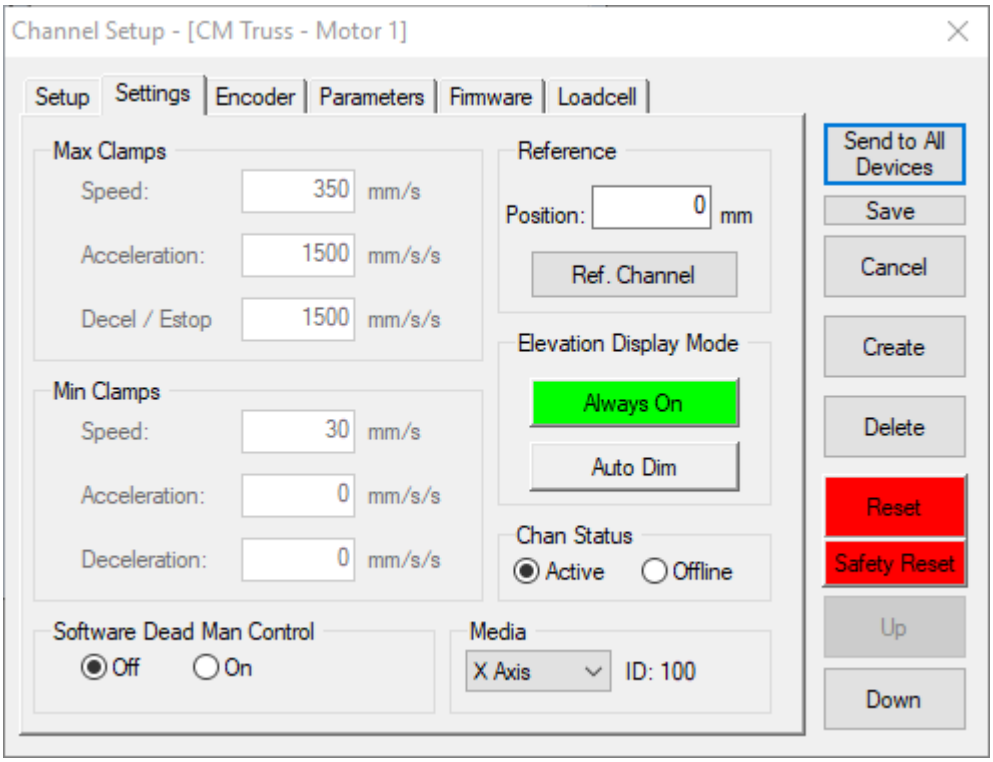


Figure 11. Channel Setup - Settings tab

8.6.1 Max Clamps

Speed, Acceleration, Decel/Estop: These settings limit the maximum speed that the device can be made to run. They also limit the ramp rates to ensure that violently fast starts and stops cannot be programmed by accident. By default, these fields are non-editable. To edit them, click on the Parameters tab and uncheck the ‘Parameters Locked’ checkbox in the bottom left corner of the window.

8.6.2 Min Clamps

Speed, Acceleration, Decel/Estop: These settings limit the minimum speed that the device can be made to run and behave in the same way as the Max Clamps as described above.

8.6.3 Software Dead Man Control:

A Dead Man’s Handle (enabling switch) can be implemented onto each channel. When "On" is selected, the Ctrl key must be pressed for movement to be initiated and held for the duration of the move; releasing it will cause the movement to stop. When "Off" is selected, this functionality of the Ctrl key is disabled.

8.6.4 Reference:

The position entered is where that channel is set to when the Ref. Channel button is pressed. Although positions outside the channel's limits will be accepted by the software, some remote devices will reject them if they are outside the current limits. In these cases, it is necessary to increase the limits, download the information and then reference the channel. The limits can then be reset and downloaded.

8.6.5 Elevation Display Mode:

These buttons are only available when "Elevation 1+" (Elevation Drive) is selected in the Protocol drop-down menu on in the Setup tab. They allow the user to toggle between different display types on the Elevation Drive for a particular channel.

8.6.6 Chan Status:

If a channel is selected to be offline, then the Vector will not send any movement commands to that channel (It cannot be moved by Vector). However, the channel will continue to provide status information.

8.6.7 Media:

This drop-down menu allows the user to select a specific direction of movement on an axis or a rotational movement about an axis for the media server output of a channel. Each movement type is assigned an "ID" from 100 to 103 to the right. In order for this to be active, access the Options window from the Tools menu and make sure the "Enable Media Server Output" option is enabled.

8.7 Encoder tab

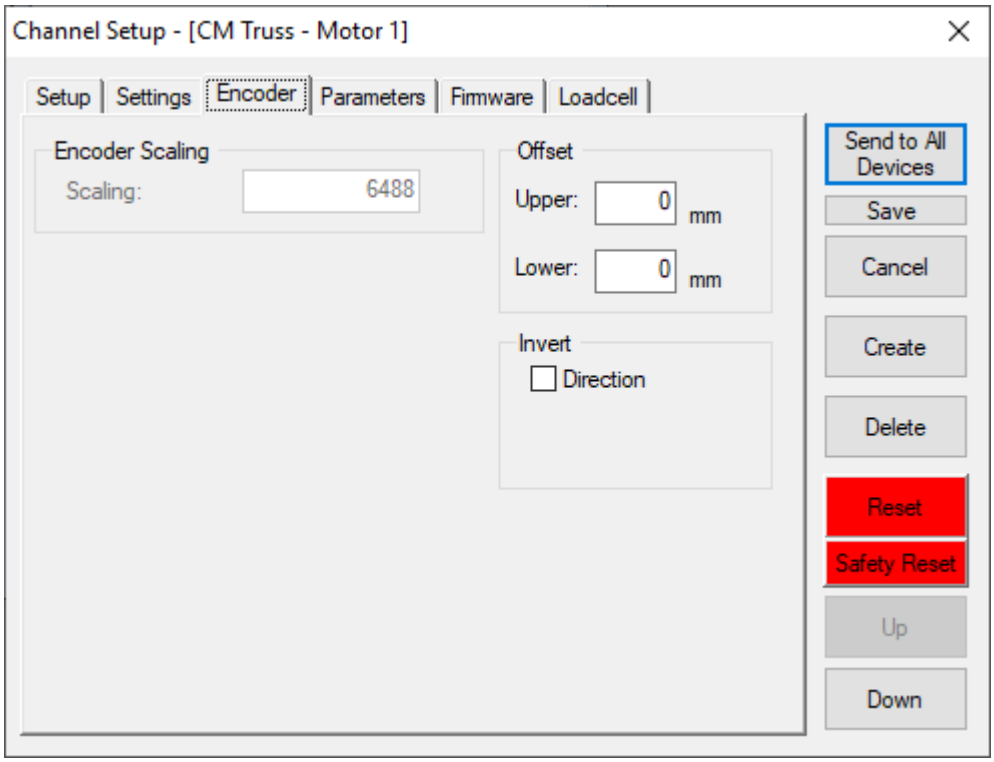


Figure 12. Channel Setup - Encoder tab

8.7.1 Calculating the encoder scaling

The encoder encoder scaling parameter converts the number of encoder pulses derived from the device to physical distance travelled in millimetres. This value is calculated differently for different Kinesys controllers. If the encoder scaling value is incorrect the result may either be no movement from the hoist, or it may overshoot or fail to reach its target position as well as running at incorrect speeds.

For the majority of Kinesys devices, the following formula should be used to calculate the new encoder scaling, which will typically result in a four digit number

$$New\ encoder\ scaling = \frac{Old\ encoder\ scaling\ \times Distance\ object\ physically\ travels}{Distance\ software\ says\ object\ has\ travelled}$$

To measure and determine the new encoder scaling use the following method:

1. Mark or note the physical starting position of an object you are moving.
2. In Vector, create a cue with a target of 1000 mm (1m) and run that cue to its full distance.
3. Measure how far the object has actually traveled.
4. Calculate the new encoder scaling using the formula above and enter this value into the Encoder Scaling field.

Offset and Invert: Small adjustments to the upper and lower encoder scaling can be made in the two Offset fields, limited to a maximum value of 99 mm. In addition, the direction of travel can be inverted with the selection of the Direction checkbox.

8.8 Parameters tab

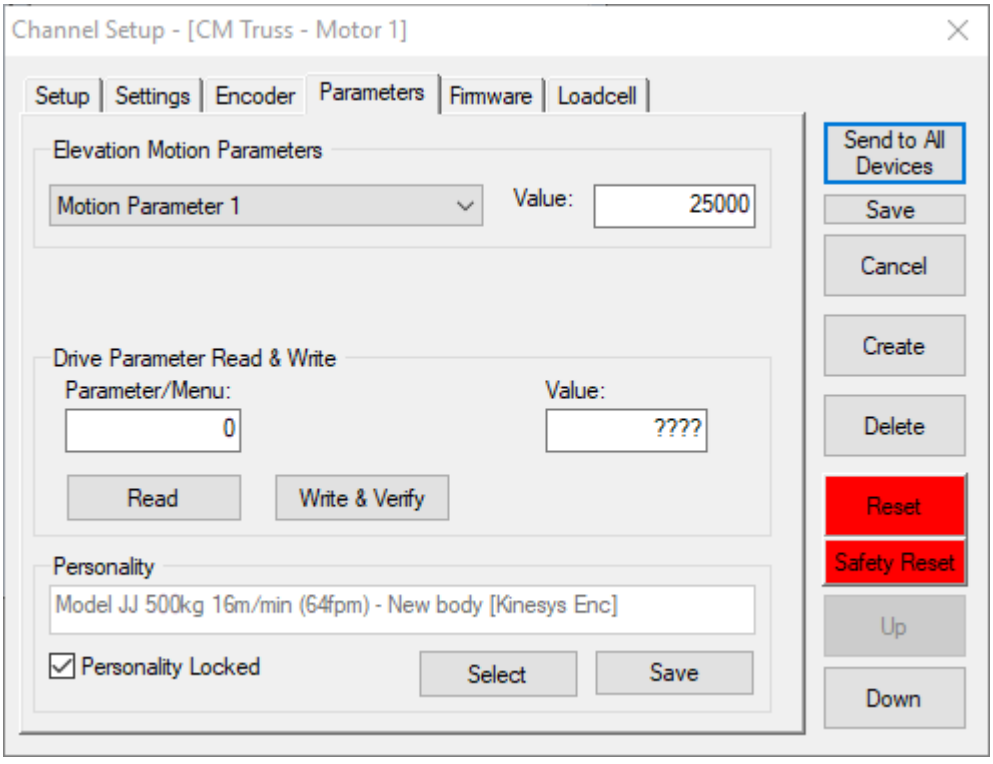


Figure 13. Channel Setup - Parameters tab

Motion Parameters: Motion parameters allow remote configuration of individual parameters within the drive. The settings change depending on the drive system so refer to individual product manuals for specific motion parameters supported by each product.

Drive Parameters: The Drive Parameter section allows for special configuration of individual parameters within the drive. The settings change depending on the drive system so refer to individual product manuals for specific drive parameters supported by each product.

Personalities: To allow simple configuration, the “Personality” of a device connected to a particular channel can be set; this will assign default values the drive parameters. A personality file is chosen by clicking the Select button and navigating to the correct file within the Windows explorer and then clicking the Save button to implement the file.

The "Personality Locked" checkbox will lock certain editable functions within the different tabs such as the maximum/minimum clamps in the Settings tab and the Encoder Scaling value.

8.9 Firmware tab

Some motion controllers support flash firmware upgrading within the Firmware tab on Vector. If this is required, then firstly search and locate the required firmware file using the Browse button. If a correctly formatted file has been found, then a description of the file will be shown in the box below along with the file name of the selected file.

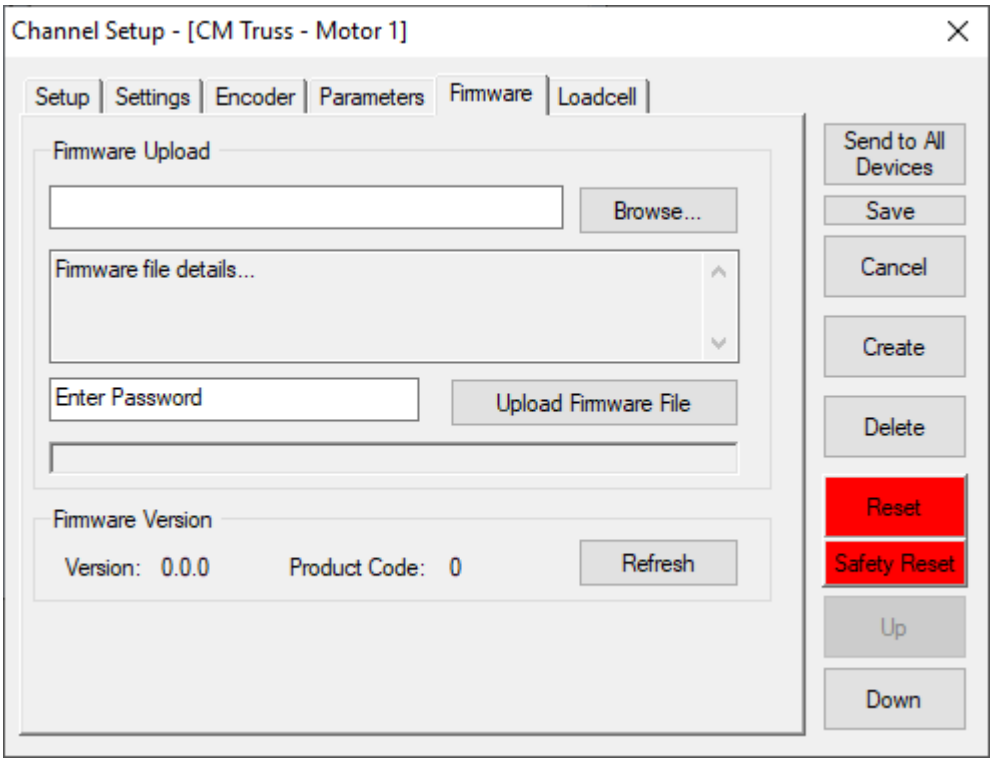


Figure 14. Channel Setup - Firmware tab

This can also be used to determine the current version of firmware in a device- this will be shown in the Firmware version section of the screen.

To ensure that only authorised uploads are permitted a password must be entered before firmware uploading. Once this has been entered, click on the Upload Firmware File button. After accepting the confirmation request, the file upload progress will be shown. There will be a pause of a few seconds before the file uploads. This is normal and allows the remote device to configure itself ready to receive the firmware upgrade.

The The default password for firmware downloads is ‘vector’. It is recommended to change this password as soon as possible to maintain security.

8.10 Loadcell tab

This tab is used for configuring the loadcells connected to a channel.

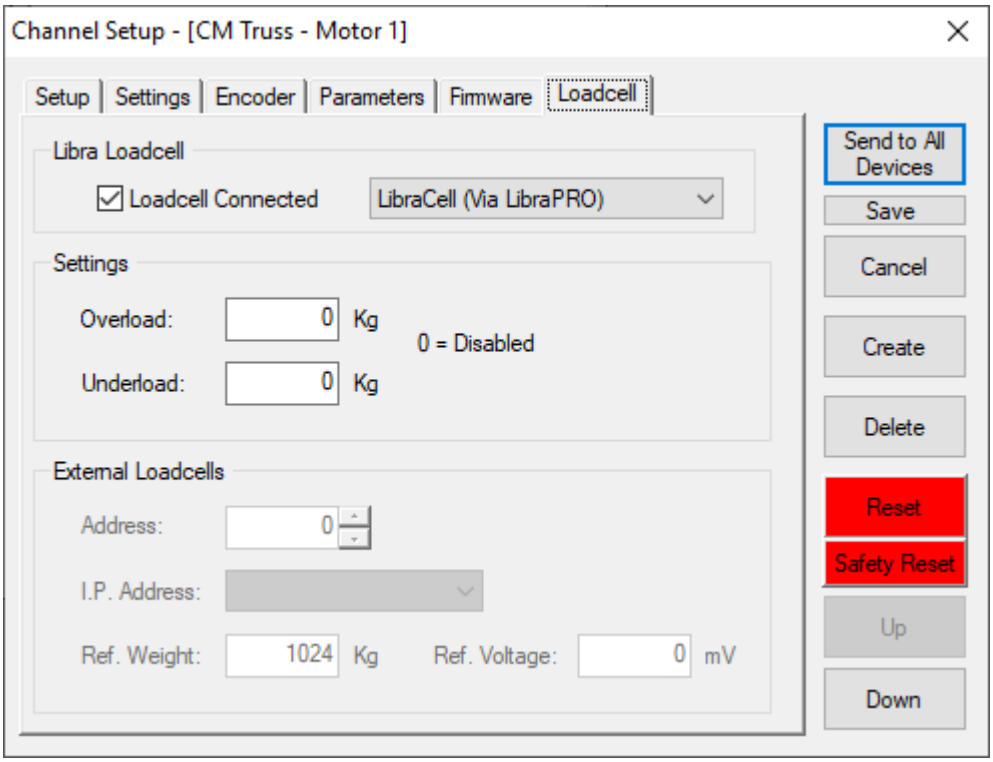


Figure 15. Channel Setup - Loadcell tab

If a channel has a loadcell associated with it, the loadcell properties can be set up in this tab. The checkbox indicates that a loadcell is connected this channel and from the dropdown menu, the correct type of loadcell can be selected from the list. If the device is not listed, select "Custom Cell" and set the "Ref. Weight" manually in the field at the bottom of the tab. For all other listed Loadcell types, the "Ref. Weight" will change automatically and will not be editable. If set to a value other than 0, the Overload and Underload values are used to stop movement up and down respectively if the loadcell on that channel is returning a load that is out of range.

8.11 Revolve mode

Revolve mode can be selected from the "Type" drop-down menu in the Setup tab. When selected, the channel works as follows:

- The bottom limit is 0.
- Moves have no top limit.
- The letter M can be entered into the Target cell on the Channel View window to indicate a move to maximum.
- +ve speeds generate clockwise movement.
- -ve speeds generate anticlockwise movement.

9. Manual operation

Vector has the ability to run using manual operation where individual channels or groups can be run without the use of cues. In Manual mode, no cue needs to be created or target positions set. Instead, when a channel is run manually the speed and target position are derived from the properties set for that channel.

To enable manual mode, click the Manual button in the Shortcuts window. It will then turn from a red stop sign to a green tick to show it is enabled:

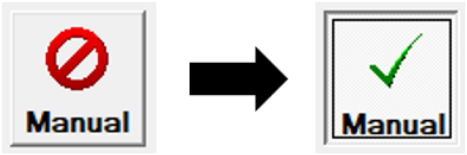


Figure 16. Switching to Manual mode

The status bar at the bottom of the screen will also change to "Manual Running: Enabled".

When the Cues button in the Shortcuts window is pressed, manual mode will also be enabled by default and both buttons change to a green tick. Pressing the Manual button again will disable this function whilst still being able to run cues.

Manual mode in Vector is not the same as using Manual mode on the front of a controlling device such as Apex Drive or Elevation Drive, which is a way of moving the device directly from the controls on the front panel.

When a channel is part of a group, any motor in the group showing a fault will cause all movement in the group to stop. Also, if the group's position window has been exceeded this will be treated as a group fault. To continue movement under these conditions the ALT or Shift key must be pressed at the same time as the F9 or F10 keys.

9.1 Moving channels in Manual mode

To run an individual channel, select it from the Channel View window to make it active. Then press the F9 key for upward movement or the F10 key for downward movement. To stop the channel at any time, press the F11 key. If using Vector Console, up and down movement can be achieved using the joystick - refer to the Vector Console operating manual for more details.

9.2 Moving groups in Manual mode

The movement of groups is the same as channels, with the exception that the Shift key must be pressed at the same time as F9, F10 or F11. If a fault develops on a channel and the group has the auto halt option selected, then all the other channels in that group will be stopped. Once a group is moving, channels within that group can be run individually in the opposite direction if required. However, once a channel is moving as an individual channel instead of as a group any fault on that channel will not halt the group. This applies even if the group was originally moving as part of a group move.

Once a group has started moving, other groups or individual channels can be selected to run as well if required.

10. Creating and editing cues

Once channel properties have been set up, the next step is to create cues which form the basis of a show.

Creating, deleting and editing cues is done using the Cue Information window, which is described in section 10.2.

Clicking the Cue Functions button in the Shortcuts window will make the buttons within the Cue Information window available for the selected cue. The same function can be achieved by simply clicking any text field within the Cue Information window.

10.1 Show Overview window

The Show Overview window displays a list of all the cues that have been created in the show file and is an important tool for navigating and editing cues.

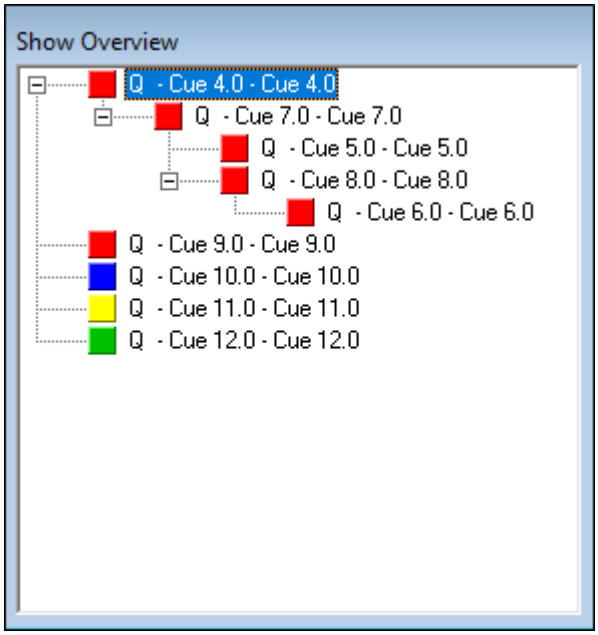


Figure 17. Show Overview window

Cues in the Show Overview window are stored and displayed in ascending numerical order. Note that this is not necessarily a chronological order in which the cues will run in a show.

The details in each row from left to right are: the short cue note, cue number and longer cue name/description. These concepts are explained in more detail in section 10.2.1. The information shown in this window will automatically update whenever any details of a cue are changed in the Cue Information window.

The coloured symbol to the left of the cue note indicates both the state of the cue and the coloured playback to which it is assigned. While the system is in Editing mode these will all be shown as squares to indicate a stopped state. Once a cue is loaded into a playback, a pause symbol will be shown in its place and when the cue is running this will be replaced by a play symbol.

The blue highlight bar indicates which cue is currently selected or active. Cue navigation can be achieved by either clicking on a different cue, using the Page Up and Page Down keys or by using the Home and End keys to go straight to the top or the bottom of the list respectively.

Cue sequences work in a similar way to a Windows folder structure. If a cue has other cues linked to it, then a plus sign will be shown next to the description, which when clicked will display the cues stored beneath it. By default, all cue sequences are shown fully expanded.

All moves within a cue can be shown by double-clicking on an empty area within the Show Overview window that does not contain text, as shown below. Double-clicking an empty area once more will collapse this view.

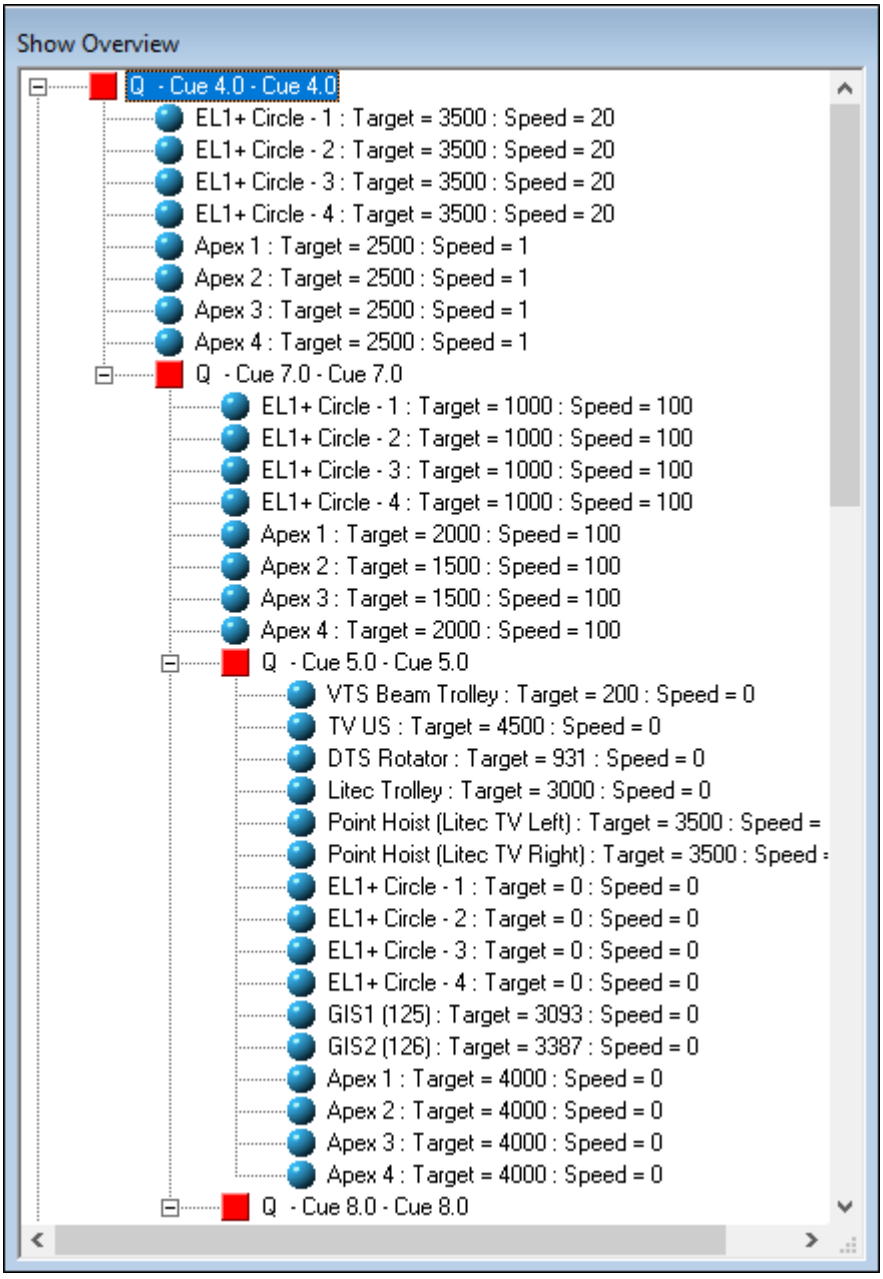


Figure 18. Show Overview window - expanded

10.2 Cue Information window

The Cue Information window is where new cues are created and existing cue parameters can be edited.

To use this window either click on the window itself or click the Cue Functions button in the Shortcuts window. The window will stay active until either OK or Cancel are pressed, at which point the Cue Functions button in the Shortcuts window will no longer be greyed out.

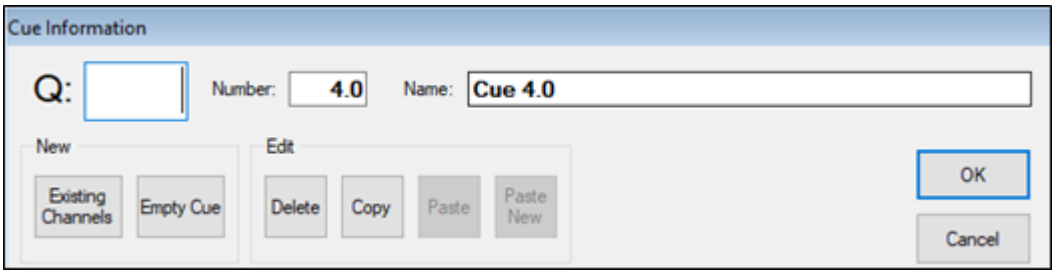


Figure 19. Cue Information window

10.2.1 Editable text fields

The three text fields at the top of the window are used to describe the cue in various ways as follows.

Short Cue Note (Q): This is the text field to the right of "Q:". It is an optional field and allows users to give the cue a short descriptive name with a maximum of three characters. If no value is entered here, then the text displayed in the Show Overview window will simply show ‘Q’.

Cue Number: This is the text field to the right of "Number:". This number determines where in the Show OVerview window the cue will be displayed. It can be changed at any time if a particular order of cues is required and can have one decimal place if needed. The number must be less than 100000.0 and greater than 0.1.

Cue Name/Description: This is the text field to the right of "Name:". This field allows the user user to give the cue a more descriptive or memorable name, making it easily identifiable when scrolling through a large list of cues in the Show Overview window. The name does not have to be unique. For example, if a user chooses to repeat a cue several times in a show then this is allowed. If no value is entered here then the name will be automatically assigned as the cue number.

10.2.2 New buttons

Creating a new cue can be done by clicking either of the "New" buttons on the left side of the Cue Information window. When a new cue is created, it will be assigned the next available whole cue number in the sequence and appear at the bottom of the Show Overview list.

Existing Channels: Clicking this button will create a new cue that duplicates the data from the currently selected cue. It is similar to the copy and paste functions but allows for an entire new working cue to be created quickly with a click.

Empty Cue: Clicking this button will create a new cue that has no moves or channels associated with it. Once created, the grid in the Channel View window will be empty.

10.2.3 Edit buttons

Delete: Clicking the delete button will initially bring up a confirmation message, and then if you still wish to proceed the selected cue will be deleted. Take care when doing this as the action is non-reversable.

Note that pressing the Delete key on the keyboard will not delete cues; this can only be done using the Delete button in the Cue Information window.

Copy: Clicking this stores the current cue into an internal clipboard with the intention of pasting and duplicating it. It stores all the associated moves but resets any link information so that when the cue is pasted it will be shown as a root cue.

Paste: Clicking this will paste the previously copied cue on top of the cue that is currently highlighted blue in the Show Overview window. To paste over a different cue, navigate to it within the Show Overview window first. A warning message is displayed before the cue is overwritten.

Paste New: Clicking this creates a new cue on a new line in the Show Overview window, using the next available whole cue number.

Copy and paste functions use the standard Ctrl+C and Ctrl+V keyboard shortcuts, while the shortcut for Paste New is Ctrl+Insert. Only one cue can be stored in the clipboard at a time.

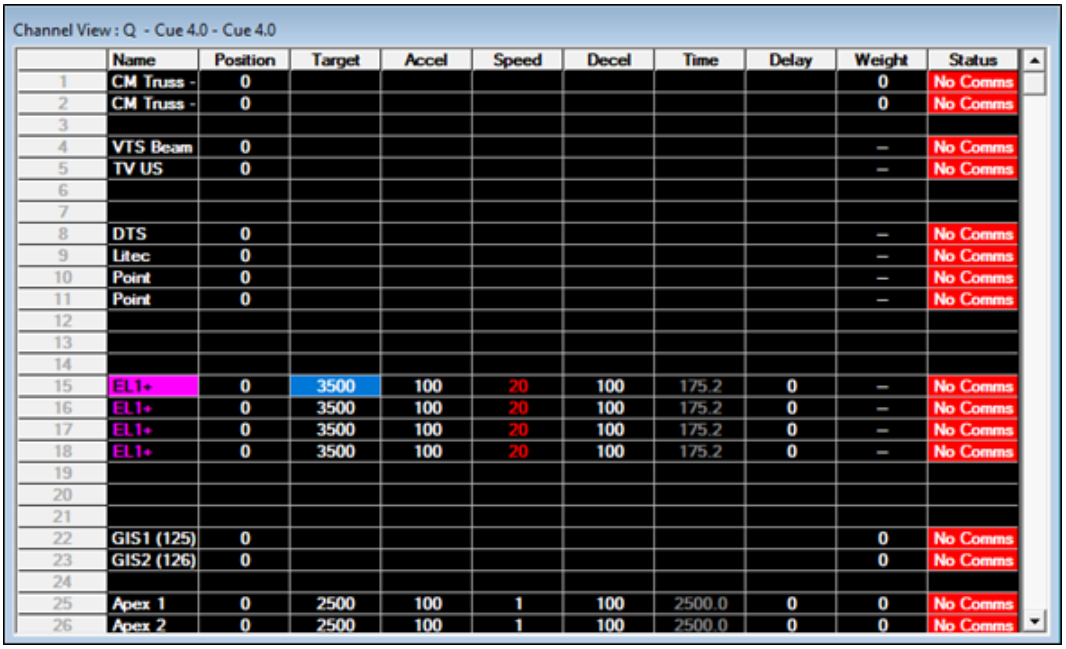
10.2.4 OK/Cancel buttons

These buttons either confirm or reject changes made to the cue. Cancel will not undelete any cues that were deleted while the window was active and also will not remove any cues that were created while the window was active.

Note that once the OK button is clicked, the buttons within the Cue Information window become greyed out with the exception of Copy and Delete. In addition, the Cue Functions button in the Shortcuts window will become clickable again.

11. Creating moves

In order for cues to generate physical movement of connected devices, they must be set up using moves in the Channel View window. Moves are the parameters that define a target position, speed, acceleration or deceleration for a given channel.



	Name	Position	Target	Accel	Speed	Decel	Time	Delay	Weight	Status
1	CM Truss -	0							0	No Comms
2	CM Truss -	0							0	No Comms
3										
4	VTS Beam	0							–	No Comms
5	TV US	0							–	No Comms
6										
7										
8	DTS	0							–	No Comms
9	Litec	0							–	No Comms
10	Point	0							–	No Comms
11	Point	0							–	No Comms
12										
13										
14										
15	EL1+	0	3500	100	20	100	175.2	0	–	No Comms
16	EL1+	0	3500	100	20	100	175.2	0	–	No Comms
17	EL1+	0	3500	100	20	100	175.2	0	–	No Comms
18	EL1+	0	3500	100	20	100	175.2	0	–	No Comms
19										
20										
21										
22	GIS1 (125)	0							0	No Comms
23	GIS2 (126)	0							0	No Comms
24										
25	Apex 1	0	2500	100	1	100	2500.0	0	0	No Comms
26	Apex 2	0	2500	100	1	100	2500.0	0	0	No Comms

Figure 20. Channel View window

11.1 Channel View window

Each row in the grid represents a channel that would have been set up in the Channel Setup window previously. The columns within the grid represent various parameters that define the moves; most are editable, but some are not, and this will depend on how each channel has been set up.

11.1.1 Active cell

By default, the active cell in the grid will be dark blue with white text. For example, in Figure 20 the active cell is row 15 in the Target column. The active cell can be moved around the grid using the arrow keys on the keyboard. Pressing Enter will make the active cell move to the row below and pressing the Tab key will move it one space to the right. Alternatively, each cell in the grid can simply be clicked and it will become the active cell.

When moving up and down channels, the active cell will automatically skip any empty rows. Clicking on an empty cell in the grid will turn a nearby occupied cell into the active cell by turning it dark blue as well all the empty cells in between. The new active cell can be either above or below the empty cell that was clicked.

If an active cell is within a channel that is part of a group, then the Name cell of the active channel will turn violet with black text. The exception to this is when the Name cell itself is active, in which case it will remain dark blue with white text. All other channels within the group will remain black but the text will turn violet to show that they are part of a group. For example, in Figure 20 cells 15 to 18 are cells that form part of a group.

11.1.2 Entering data

To edit data inside a cell or to enter new information into an empty cell, either click on the cell or navigate to it with the arrow keys and begin typing. Do not double-click a cell as this will bring up the Palette instead.

The cell will turn light blue when data is being type into it. The format and length of numbers that can be entered changes for different columns and these are explained in more detail in section 11.1.4. Once entered, press Enter or Tab to store the information and move to the next cell.

Press Escape or click another cell in the grid to cancel the entered data and restore the previously entered data.

11.1.3 Deleting data

Deleting move data from a given cell cannot be done using the Delete key on the keyboard. Instead, click the Select Channels button in the Shortcuts window, then the click relevant large buttons on the grid so they are deselected and finally click OK. For more details on the Select Channels button, see section 11.2.

11.1.4 Channel View columns

Note: Each column can be expanded by hovering over the right edge of the column name cell until the double arrow icon appears, and then clicking and dragging to the right. When the file is saved, Vector will remember these column sizes on the next startup. To then reset the columns to their original size, select "Reset Column Widths" in the Windows drop-down menu at the top of the screen.

Name: This column is read only and displays the name of the channel. By default, the name is displayed in white text with a black background. Double-clicking any cell in the Name column will bring up the Channel Setup window for that channel where the Name can be changed if user permissions allow.

Position: This column shows the current position in mm reported by the device in each channel and is also read only. On startup, the system will attempt to set up communications with all channels; if this fails then a current position of zero is displayed. When the system is in Simulation mode, a virtual position will be shown that will start at the current position but will change as simulated movements are performed. The current position will be restored when the system is put back into Active mode. Double clicking the Position column will bring up the Reference Position window, where a new reference position for that channel can be specified.

Target: This column displays the target position in mm that has been programmed for a particular channel. Only channels with moves in the currently displayed cue will have data in this cell. By default, the text is shown in white. However, if the text is light blue this indicates that the target shown is outside the software limits. If the cue is run with the target in this state, the target position sent to the device will be adjusted automatically to prevent the device running outside its limits. The target can be either positive or negative and is limited to seven characters. This corresponds to a maximum value of 9,999,999 mm and a minimum value of -999,999 mm. Double clicking a cell in the Target column will bring up the Palettes window, which can be used to create global reference positions. This is discussed in more detail in section 13.

Accel: The acceleration rate is defined in units of mm/s^2. Only positive values can be entered in this column.

Speed: The speed is defined in units of mm/s. Only positive numbers can be entered and care must be taken to ensure that speeds are not greater than the maximum speed of the attached device. If the text is shown in white, then the move will have speed priority, which means that the device will travel at the entered speed towards its target. Typing the word STOP in the cell will cancel all moves within that channel and make the Target, Accel and Decel cells non-editable.

There re two exceptions to this: the first is when the target is too close to the current position for there to be enough distance to reach the speed before it has to decelerate to its target position. The second is when the move has time priority instead of speed - if this is the case then the speed will be displayed in grey text and the value will change as the distance between the current and target position changes.

Decel: The deceleration rate is defined in units of mm/s^2. Only positive values can be entered in this column.

Time: The time is defined in seconds. By default, this value is shown in grey text, which indicates that the move has speed priority. In this case, the value shown is the time the device will take to travel from its current position to the target position based on the speed and ramp values entered. To specify how long a device will take to complete the move, a value can be entered into the time field. This will change the move from speed priority to time priority and will change the text in the time field to white. The system will then automatically adjust the speed value in the move to ensure that the time of travel will be what was specified.

The exception to this is when the distance between the two positions is so great that the move cannot be completed in the time specified based on the ramp rates that have been entered. In this case, either a longer time period must be entered, or the ramp rate must be made faster. Note that the time entered is the time taken from the moment the device starts moving. Therefore, if a delay is included in the move then the total move time will be the sum of the time value and the delay value. Although the time value is displayed to a resolution of 0.1 seconds, values can only be entered in whole numbers of seconds.

Weight: This column is non-editable and used to display the weight in kg of a channel's load. A non-zero value is only displayed if the channel has a load cell associated with it.

Status: The status column has a dual function: the colour of the cell indicates the status of the communications for that channel and the text provides information about the what the device is currently doing. Double clicking a cell in the Status column will also bring up a more detailed message window and possible remedies to status errors.

Cells in the status column can either be red, yellow or green.

- Green indicates good comms between the computer and the device.
- Red indicates that the device is turned off or there are no comms at all.
- Yellow indicates intermittent comms, an unknown comms error or the channel is switched to offline mode.

It should be noted that offline devices can have a negative effect on the overall comms speed to the other connected devices. In cases where a device will be offline for a long period, it may be advisable to make a copy of the show file and delete the offline channel within that file. If a device is turned back on while the system is running, then the colour will change from red to green once comms have been re-established.

In the case of a red fault message, double-clicking the field will display a message box describing the fault code that is being reported and, if known, the manufacturer's description of the fault; this can help to diagnose the fault quickly. A full list of status messages is shown in section 15.

11.2 Select window

The Select window can be accessed by clicking the Select Channels button on the Shortcuts window. This window shows a grid of large buttons, with each button representing a channel. Buttons that appear "pressed in" have moves associated with that channel.

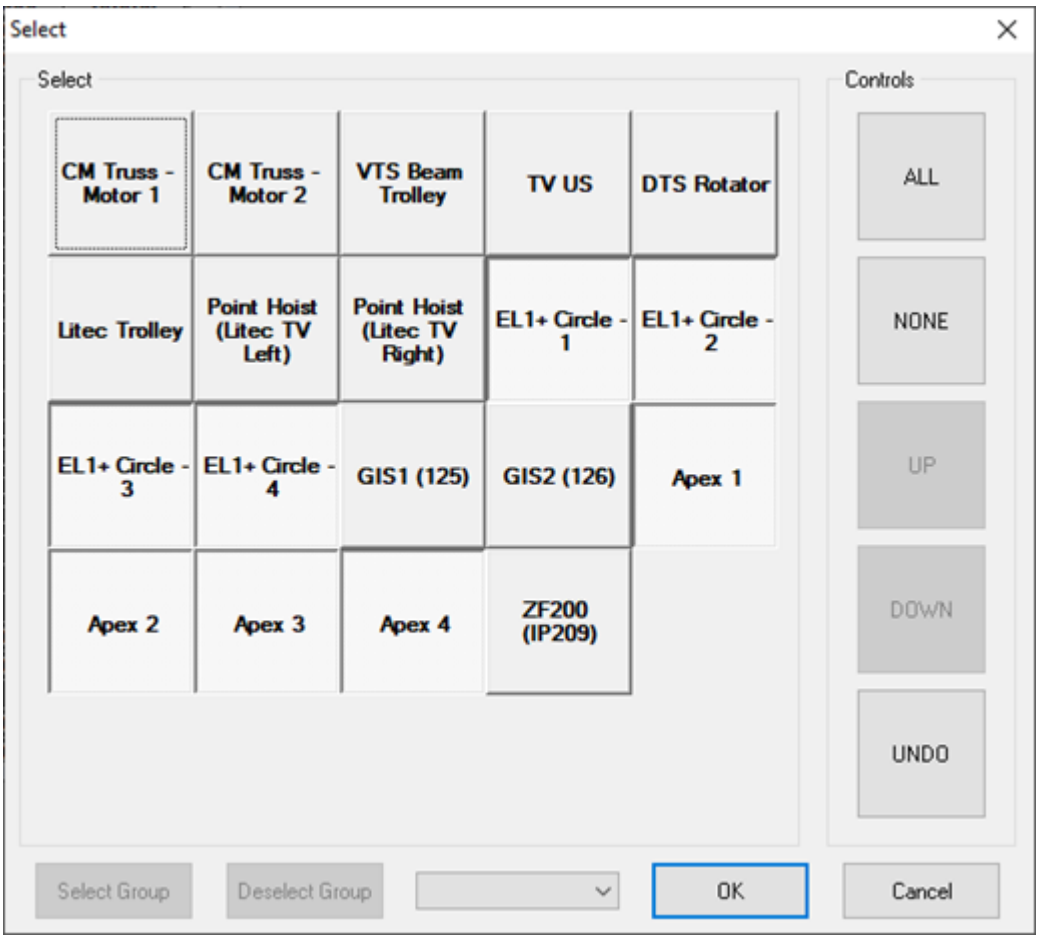


Figure 21. Select window

Turning the grid buttons on and off is a quick way of adding or deleting move data on multiple channels.

If no move data is currently assigned to a channel, clicking its button on the grid will add default values in that channel to create moves. Clicking "OK" will then close the window and populate the selected cells with move data in the Channel View window.

All/None buttons: Clicking the All button will populate every available channel with move data regardless of which channels were previously selected. The None button has the opposite effect and removes move data from every channel in the grid.

Up/Down buttons: The window can display up to 25 channels at a time on the grid. If there are more than 25 channels, use the Up and Down buttons to scroll to another grid.

Undo button: Undo removes all the changes that have been made since the window was opened. It has the same effect as pressing Cancel and then re-opening the window.

Select Group/Deselect Group: Entire groups can be selected and deselected in one go using these buttons. First click on the dropdown arrow at the bottom centre of the screen to choose a group. Once a group is chosen, the Select Group and Deselect Group buttons will become available and clicking will then either select or deselect all the channels in that group. For details on how to set up groups, see section "Groups" on page 45.

OK/Cancel buttons: OK saves the changes you have made to the selected channel/s. Moves will be created and deleted in the cue as appropriate and the window will close. Cancel ignores any changes that have been made and simply closes the window.

12. Linking cues

Cues can either be standalone operations can or be linked to other cues in a defined sequence.

To link cues, click on the Link Functions button in the Shortcuts window. This will bring up the Edit Link window. Note that the current cue being edited is displayed within the text of the square brackets at the top of the Edit Link window.

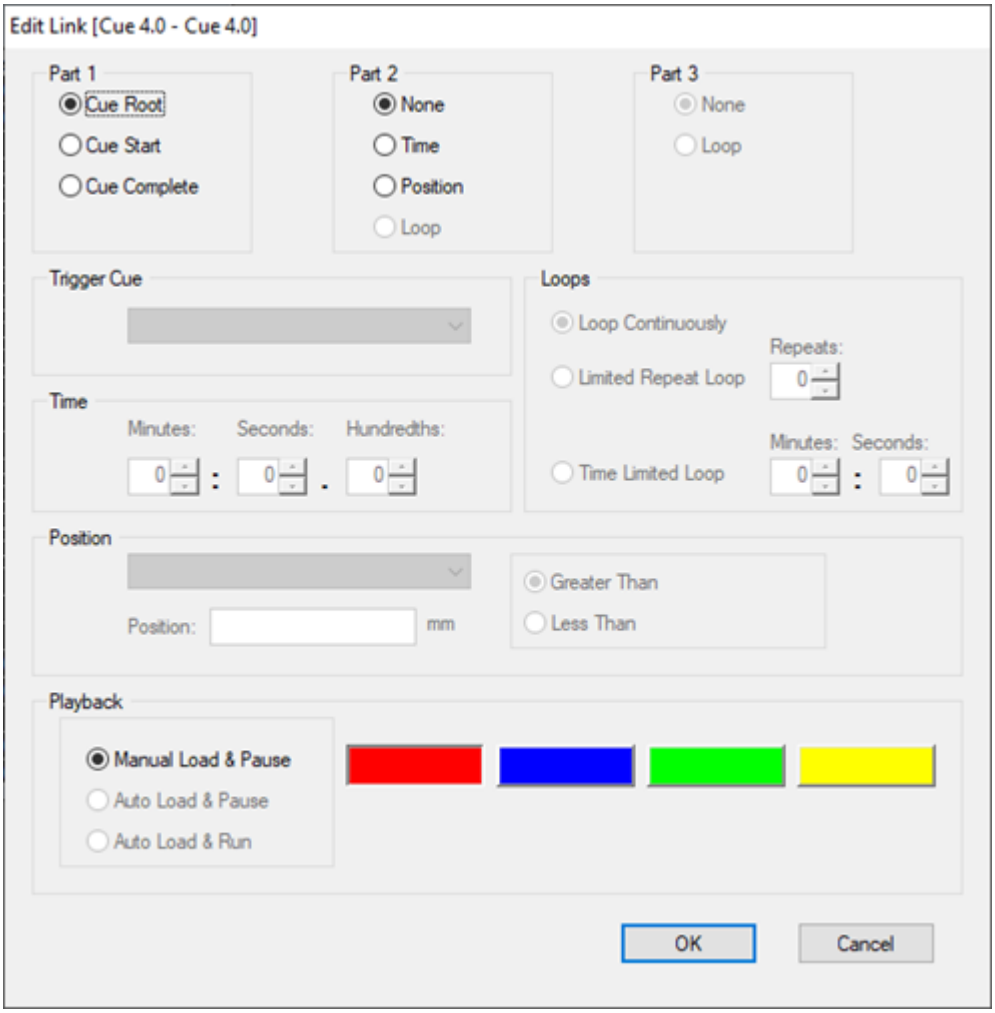


Figure 22. Edit Link window

At the top of the there are three areas containing radio buttons: Part 1, Part 2 and Part 3.

12.1 Part 1

Cue Root: If this is selected, then the cue will either be a standalone cue containing no linked cues or it will be the first cue in a sequence of links. By default, all new cues are created as root cues.

Cue Start: If this is selected, the cue will start at the same time that another cue starts. The second cue is known as the trigger cue and can be selected from the "Trigger Cue" drop-down menu .

Cue Complete: If this is selected, the cue will start once the trigger cue has ended. The trigger cue can be selected from the drop-down menu in a similar manner to Cue Start.

12.2 Part 2

None: None is the default option and means that trigger cues will begin instantaneously with no delay after the Cue Start or Cue Complete signals.

Time: This option allows a time delay to be added between the current cue and the trigger cue. When this is selected, the Minutes, Seconds and Hundredths fields in the Time area become editable.

Position: This option allows the cue to start when another channel has reached a specific position. When selected, the drop-down menu and text field in the Position area become editable. The drop-down menu lists each channel in the system and the position in mm can be entered into the field. The position can either be greater or less than the number entered using the two radio buttons to the right.

12.3 Part 3

If either "Time" or "Position" are selected in Part 2, Part 3 gives the option to create a loop based on the settings of the time or position by selecting "Loop".

12.4 Playback settings

The bottom area of the Edit Link window contains the four different coloured playback options for the cue. Clicking one of the coloured boxes will assign the cue that colour. If two cues are linked together but they were originally assigned different colours, a warning message will appear on screen when OK is clicked that reads "All links in the sequence will have their playbacks set to match the root cue". When OK is clicked again and the window closes, the linked cues in the Show Overview window all have the same coloured symbol next to them.

The other radio button options are used to determine how the cue is loaded into the playback. If Cue Root has been selected in Part 1, then the only option available is "Manual Load & Pause", which means the playback can only be loaded, played and stopped manually by using the key commands or buttons if using Vector Console.

The other two options are used for linked cues, which by definition have to be automatically loaded. "Auto Load & Pause" will automatically load the cue into the playback but will not run it until the command is given by the user, whereas "Auto Load & Run" will run the cue in addition to loading it automatically. As a general rule, it may be best to use "Auto Load & Pause" until you are sure of how the different channels will interact, as it can always be changed to "Auto Load & Run" later when the show is operating as intended.

12.5 Ok/Cancel buttons

After setting up the link functions in the Edit Link window, click OK to save the settings and close the window. When this is done, the cue will sit on the next level down in the Show Overview window indicating that it has been successfully linked to another cue. Clicking Cancel will cancel any changes made and close the window.

13. Using the Palette

The Palette can be used to create a show that has global position references and global speed profiles. There are two ways to access the palette; either by clicking on the Palette button in the Shortcuts window or by double clicking any cell in the Channel View window that the palette can affect such as Target, Accel, Speed and Decel.

The Palette is made up of three tabs; Presets, Profile and Groups. If the Palette is opened by clicking the Palette button then the Groups tab will be shown and if it is opened by double clicking on a cell then the Presets tab will be shown.

13.1 Presets

The Presets tab allows users to create a global position system and create a name for a specific position as opposed to just a number, for example "top", "middle" or "bottom".

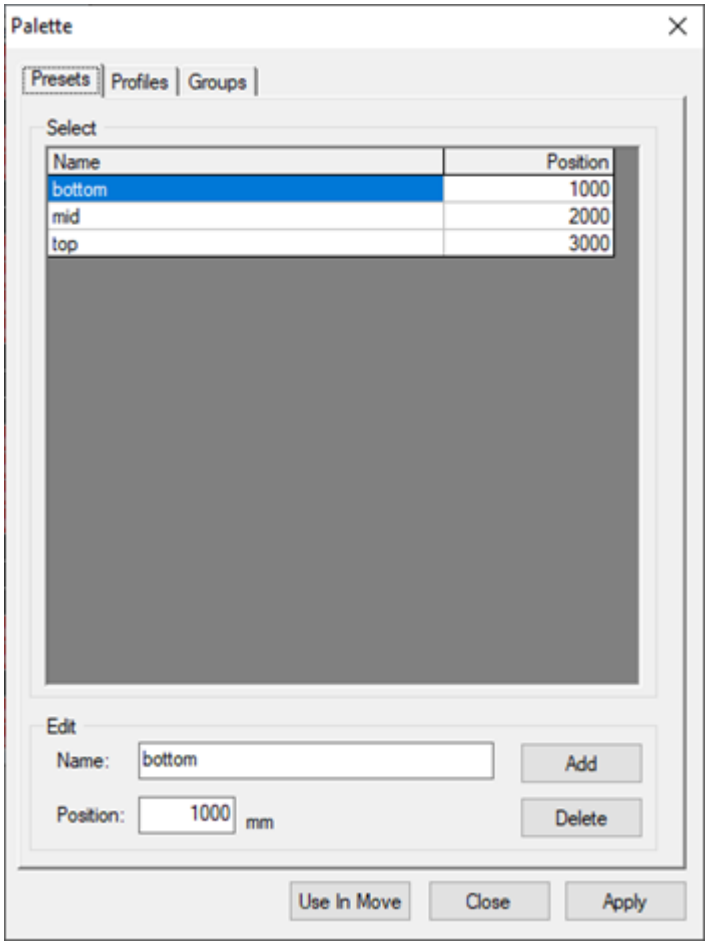


Figure 23. Palette window - presets

An example of where this feature may be useful is on a touring show, where the top limit may change relative to the ground for different venues. Rather than changing each individual channel's position manually it saves time to only change the limit of the preset. The change is then automatically applied to every cue that contains that preset name. In the example above, the top limit for a new venue could be changed from 3000 to 3500 and this would update any cue that contains the 'top' preset.

To create a new preset, start typing the name of it in the Name field at the bottom of the window and then assign its position in mm in the field below. Click the Add button on the right and the new preset will appear in the list above. It is not possible to create two presets with the same name. If this occurs, an error message will be displayed.

To delete a preset, select the preset from the list and then click the Delete button. Then confirm the action in the resulting warning message.

Click the "Use In Move" button to apply the preset to the channel that is currently active in the Channel View window. The name of the preset will then appear in the Target column on the active channel.

Once a preset has been created, it is then possible to type its name into any cell in the Target column in addition to numerical values. In the example shown in Figure 23, typing "top" into the cell would apply the "top" preset to it.

13.2 Profiles

The Profiles tab allows users to create a global speed profile and to name it in a similar manner to presets.

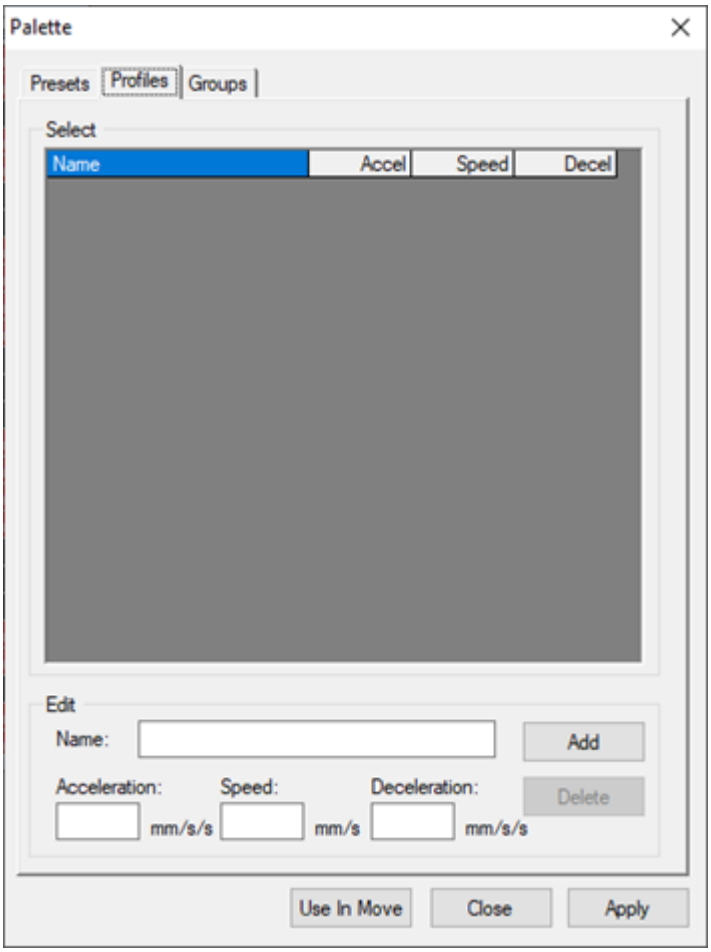


Figure 24. Palette window - profiles

To create a profile, type a suitable name for it in the Name field at the bottom of the window. Then enter numerical values in the Acceleration, Speed and Deceleration fields. Click the Add button on the right and the new profile will appear in the list above.

Note that all three numerical fields must contain a number; if one does not, an error message will be displayed when the Add button is clicked.

To delete a preset, select a profile in the list and then click the Delete button. Then confirm the action in the resulting warning message.

Click the "User In Move" button to apply the profile to the channel that is currently active. If a channel is part of a group then the profile will be applied to all channels within that group. Once "Use In Move" is clicked, the name of the profile will appear in the Speed column of the relevant channels.

13.3 Groups

Groups allow multiple channels to be run with one key press and allows those channels to be accessed quicker.

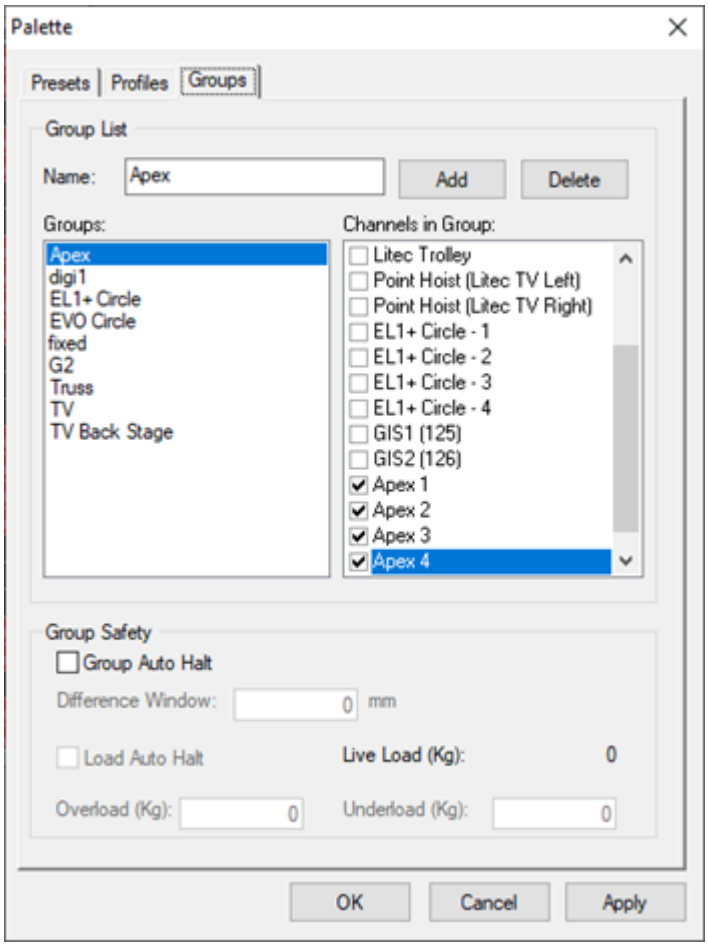


Figure 25. Palette window - groups

Available channels are listed in the "Channels in Group" pane on the right side of the window. To create a new group of channels, start by typing the name of the group in the Name field at the top. Then select which channels you want in the group using the checkboxes on the right and finally click the Add button. The new group will then appear in the Groups pane on the left. In the example above, a group called "Apex" has been created, which contains the four Apex channels as selected in the "Channels in Group" pane.

If a channel is added to a group that is already a member of another group then a warning message will be displayed to make sure the user aware of this.

To delete a group, select it from the Group pane and then click the Delete button. Then confirm the action on the warning message.

To edit the details of an existing group, such as the name or the channels that it applies to click the Apply button at the bottom of the window. The changes made will then be automatically applied to all the affected cues and channels.

13.3.1 Group Safety

This section of the Groups window allows various group safety settings to be configured.

Group Auto Halt: If this checkbox is selected and a channel reports a fault that meets the conditions set here then all other channels in that group that are currently running will stop.

Difference Window: This value defines the maximum difference in mm between any motors in a group that will cause the group to halt. When "Group Auto Halt" is active the Difference Window will always be active for every channel in the group. To disable this feature, set the Difference Window to value larger than the maximum possible difference between any two motors in a group.

To allow manual movement of a motor so that its position can bypass the Difference Window press the ALT key during movement.

Load Auto Halt: If load cells are active within any channels of the group, "Live Load" displays the current total load calculated by the load cells.

Selecting the "Load Auto Halt" checkbox allows the Overload and Underload values to be edited. The Overload value is the upper load limit at which all movement will stop, and the Underload value is the lower limit.

14. Running cues

Once all cues have been created and linked together if necessary and all presets, profiles and groups are configured, the cues can now be run and movement can begin – this forms the basis of a show. To enable this mode, click the Cues button in the Shortcuts window or press F12 on the keyboard and ensure that the button changes from a red stop sign to a green tick.

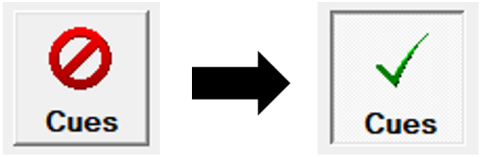


Figure 26. Cues button

In addition, ensure the playback bar appears at the bottom of the screen containing the red, blue, green and yellow playback boxes. This indicates Vector is now in Running mode.

Figure 27. Coloured playbacks

Once in Running mode, all editing options are disabled. If you want to make changes to cues or channels, switch back to Editing mode by clicking the Cues button again.

Switching from Running mode to Editing mode automatically causes a stop command to be sent to all channels. This is a safety feature to ensure that no channels are still running while the system is being edited.

14.1 Playbacks

Playbacks are central to the execution of shows as they allow multiple cues to be loaded, played and paused. Four playbacks are available and can be operated independently of each other. If two or more separate playbacks share the same channels, the playback you pressed first takes precedence and any additional playbacks with conflicting channels are canceled.

The keyboard keys central to playback operation are as follows.

Operation	Key
Turn on Running mode	F12
Red Start	F1
Red Stop	F2
Blue Start	F3
Blue Stop	F4
Green Start	F5
Green Stop	F6
Yellow Start	F7
Yellow Stop	F8
All Stop	Space

If using Vector Console, the Play and Pause buttons on the console can be used instead of the keys and releasing the enabling switch will stop all movement.

15. Status messages

The following list shows the Status messages that could be shown in the Status column of the Channel View window.

Note: Double clicking any fault status message in the grid will bring up a message box with details on the fault and suggestions on how to resolve it.

Status message	Description
(DMH)	Channel Faststop not active (press enabling switch)
Aborted	Move aborted
Accelerating	Channel accelerating
Boot	Channel reporting it's in Boot loader mode
Braking	Channel stationary and braking
Comms Fault	Internal error in control box
Decelerating	Channel decelerating
Disabled	Channel is disabled or has no devices connected
DN Hard Limit	Lower hard limit reached
DN Soft Limit	Lower soft limit reached
DN Ult Limit	Lower ultimate limit reached (all movement inhibited)
Drive Trip	Channel reporting drive tripped
Encoder Fault	Channel reporting encoder fault
Estop Active	E-Stop button pressed on that channel
Ext Flags	Fault on that channel
Local Control Active	Channel is in Local Control mode
Moving	Channel moving
Moving DN	Channel moving down
Moving UP	Channel moving up Channel has no communications
No Comms	Channel has no communications
OK	Channel OK and ready to run
OK (DigMaster)	Channel OK to run, channel is Digital Lock Master
OK (DigSlave)	Channel OK to run, channel is Digital Lock Slave
OK (Limits Off)	Channel OK to run, soft and/or hard limits bypassed
OK (Mimic Enc)	Channel OK to run, also encoder is in Mimic mode
OK (No Enc)	Channel OK to run, no encoder on channel
OK (Revolve)	Channel OK to run, channel is in Revolve mode
Over Load	Overload limit reached
Over Load (Libra)	If Libra load cell is on channel, overload limit reached
Over Speed Error	Over speed error reported on channel
Power Off	Channel reporting drive power off
Remote Control Active	Channel is in remote control mode
Reset	Channel resetting
Status (xx)	Unknown status error, xx = error code
Under Load	Underload limit reached

Status message	Description
Under Load (Libra)	If Libra load cell is on channel, overload limit reached
Under Speed Error	Under speed error reported on channel
UP Hard Limit	Upper hard limit reached
UP Soft Limit	Upper soft limit reached
UP Ult Limit	Upper ultimate limit reached (all movement inhibited)
WReset	Channel resetting

16. Simulation mode

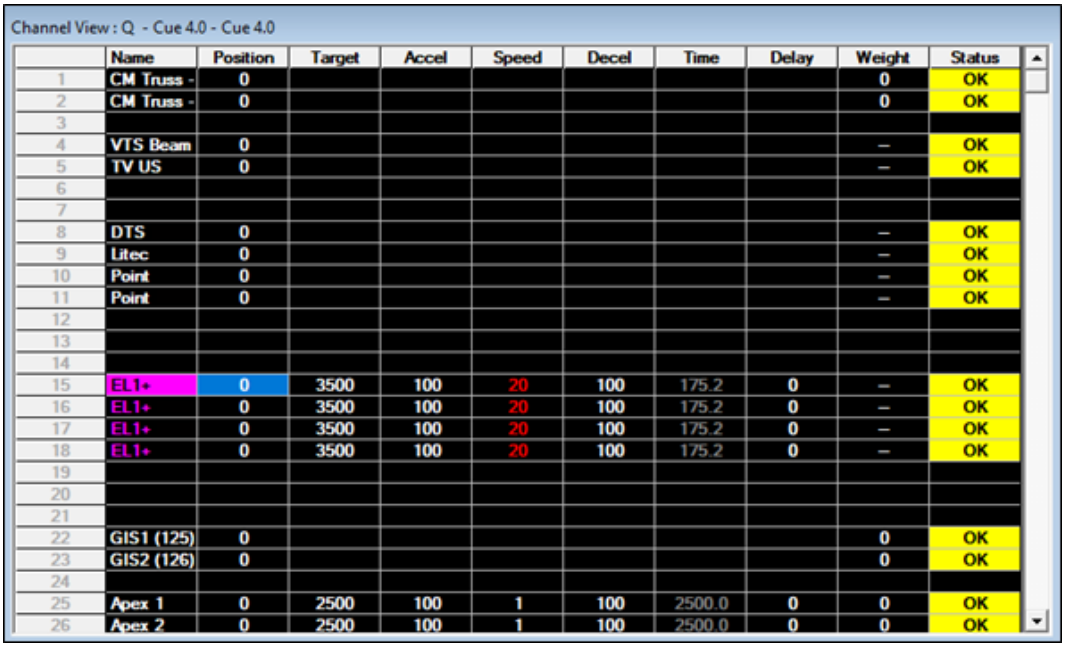
The default mode of operation in Vector is Active mode, which gives the user full control of channels, allowing them to be programmed, edited and moved.

Simulation mode allows full editing functions but stops communications to real world devices. Any channels that are requested to move will not move but instead will recreate the position change information internally to provide position changes on the screen as if the channel was moving.

The position changes as it would in the real world at the speed that has been requested. Ramp information is ignored however, so timed cues may show as completing in slightly different times in Simulation mode.

Simulation mode can be turned on and off in the Tools menu at the top of the screen and can only be changed when in Editing mode. Position updates are not performed in Simulation mode, so the current position displayed on the screen will not refresh until Simulation mode is turned off.

If Vector is running in simulation mode, the background colour of the Status column in the Channel View window will change to yellow and display "OK", as shown below. The status bar at the bottom of the screen will also display “Vector : Simulation”.



	Name	Position	Target	Accel	Speed	Decel	Time	Delay	Weight	Status
1	CM Truss -	0							0	OK
2	CM Truss -	0							0	OK
3										
4	VTS Beam	0							–	OK
5	TV US	0							–	OK
6										
7										
8	DTS	0							–	OK
9	Litec	0							–	OK
10	Point	0							–	OK
11	Point	0							–	OK
12										
13										
14										
15	EL1+	0	3500	100	20	100	175.2	0	–	OK
16	EL1+	0	3500	100	20	100	175.2	0	–	OK
17	EL1+	0	3500	100	20	100	175.2	0	–	OK
18	EL1+	0	3500	100	20	100	175.2	0	–	OK
19										
20										
21										
22	GIS1 (125)	0							0	OK
23	GIS2 (126)	0							0	OK
24										
25	Apex 1	0	2500	100	1	100	2500.0	0	0	OK
26	Apex 2	0	2500	100	1	100	2500.0	0	0	OK

Figure 28. Simulation mode

17. Contact and support

If you would like to get in touch with TAIT in regards to any aspect of Vector or other products, please use the following contact details.

Email: info@taittowers.com / support@taittowers.com

Telephone: +44(0) 20 8481 9850

Website: www.taittowers.com/products

17.1 Feedback

If you find that Vector does not include a feature that you would find useful, then please let us know. It may be that is has just been disabled in this version of the software. We will consider all suggestions for features and changes to the operation of Vector, and you may find them appearing in the next version release.

In the unlikely event that you find that Vector is not behaving how you would expect, then please let us know this as well. If we don't know the problem then it can't be fixed. Please give as much detail as you can about what you have found and if you think it will help us please send us the show file you were working on when it happened.

Please send all feedback to vector.feedback@taittowers.com

Please include the following in your message:

- Name
- Company
- Email address
- The computer and operating system you are using
- The version of Vector you are using