



MARK ROBERTS MOTION CONTROL

POLYMOTION CHAT PRO 3.0



QUICK START GUIDE

Product code: MRMC-2121-00

Polymotion Chat Pro 3.0 Quick Start Guide

Product code: MRMC-2121-00

© 2022 Mark Roberts Motion Control Ltd. All rights reserved.

No part of this publication may be reproduced, transmitted, or translated by any means — graphical, electronic, or mechanical — including photocopying, recording, taping, or storage in an information retrieval system, without the express written permission of Mark Roberts Motion Control.

Although every care has been taken to ensure that the information in this document is accurate and up to date, Mark Roberts Motion Control continuously strives to improve their products and may make changes to the hardware, firmware, and software described in this document. Mark Roberts Motion Control therefore cannot be held responsible for any error or omission in this document.

All product names mentioned herein are the trademarks or registered trademarks of their respective owners.

Contact information

Mark Roberts Motion Control Ltd.

Unit 3, South East Studios

Blindley Heath

Surrey

RH7 6JP

United Kingdom

Telephone: +44 (0) 1342 838000

E-mail: info@mrmoco.com (sales and general enquiries)
support@mrmoco.com (customer support)

Web: www.mrmoco.com
www.mrmocorentals.com

Contents

Chapter 1	Polymotion Chat Pro 3.0	1
	Overview of the Polymotion Chat Tracking System	1
	Setting up Polymotion Chat Pro	2
	Connecting Cables (Example: Dell 1U Server)	2
	Launching Polymotion Chat Pro	3
	Setting up Polymotion Chat Pro using Network	
	Setup and Chat wizard	3
	Setting up the robotic heads for Polymotion Chat	
	Pro	11
	Polymotion Chat Pro Main page.....	12
	Axes sliders and joystick controls.....	13
	Note regarding Panasonic PTZ Head Zoom	
	Function.....	14
	Tracking Sensitivity	14
	Setting pan and tilt soft limits	15
	Tracking modes	16
	Starting Tracking	17
	Static zones.....	18
	Altering Static Zones.....	20
	Fine adjustment of autoframing zoom	
	position	20
	Motion Prediction	21
	Stopping Tracking.....	21
	Using the Multi-screen View (For Multiple Heads	
	only)	22
	Changing Tracking Settings in the Client View.....	22
	Polymotion Tab Settings	27

Appendix 1	Polymotion Chat Pro Installation	29
	Minimum Hardware Specifications.....	29
	Recommended Hardware Specifications	29
	Additional Hardware Requirements.....	29
	Installing Polymotion Chat	29
	Configuring the Polymotion System	31
	Configuring the Blackmagic DeckLink cards.....	31
	Installing Polymotion Launcher	31
	Installing CV Engine	37
	Licensing your Polymotion Product	40
	WRNCH Licensing.....	41
	Backup and Restore CV Engine Settings	42
	Import	42
	Export.....	43
	Save Config.....	43
	Restore Defaults	44
	Remote Client Configuration.....	45
Appendix 2	Troubleshooting.....	49
	Resolving Video Feed issues	49
	Handling Lost Video Feed Issue	49
	Graphic Card Device Driver Issues.....	51
	Handling Nvidia GPU issues.....	53

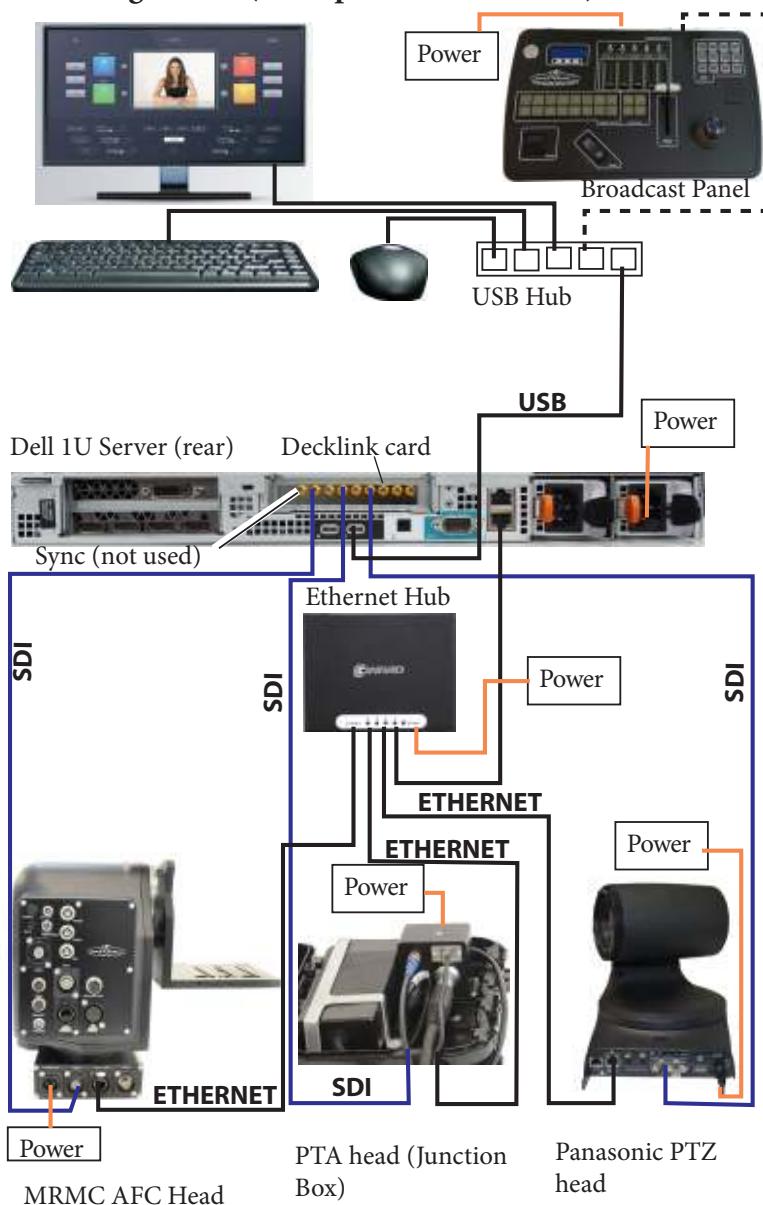
Chapter 1 Polymotion Chat Pro 3.0

Overview of the Polymotion Chat Tracking System

Polymotion Chat is an advanced broadcast camera automation system solution. The advanced integrated AI engine detects face and limbs building a model of the subject and uses this to control and predict movement delivering high quality and natural camera motion. The easy to use interface allows the operator to track using up to three robotic heads, define static zones (so the camera will only move when there is enough movement by the subject), create an offset to allow for graphics to be on screen with the talent, manage acceleration and deceleration so the movement remains natural even on very tight or wide shots and many other options.

Setting up Polymotion Chat Pro

Connecting Cables (Example: Dell 1U Server)



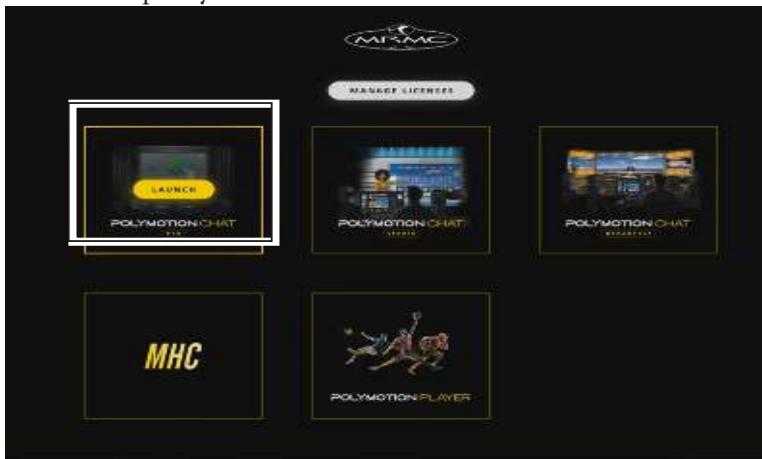
Launching Polymotion Chat Pro

MHC Polymotion Chat runs via a utility called Polymotion Launcher. To learn more about installing Polymotion Launcher, refer to Appendix 1 *Polymotion Chat Pro Installation* on page 29.

1. Use the icon on desktop to launch Polymotion Launcher.



2. Click/tap Polymotion CHAT PRO.



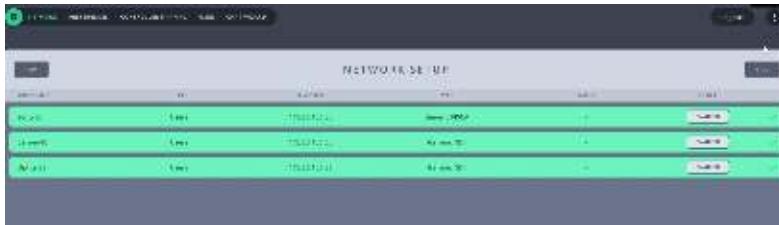
3. If you are launching this for the first time, you will be required to add a new license file or a license code. Contact MRMC Support for a new license. Refer to *Licensing your Polymotion Product* on page 40.
4. Once you have supplied a license code, MHC Server and Client are launched, login to MHC Client as Admin:
Username: Admin
Password: Admin1234

Setting up Polymotion Chat Pro using Network Setup and Chat wizard

1. Cable together the robotic heads, Polymotion PC, cameras, and joysticks participating in the Polymotion network. Also connect the PC with the cameras using appropriate cables and data converters

depending on method used for streaming the video. The possible incoming sources of videos used by Polymotion system are: **USB Device, RTSP Stream, Decklink and NDI**.

2. Use the FIND button to retrieve a list of available robots on your network. Add all the robots that would be part of the Polymotion Chat system in the MHC Network setup page. Remember to specify the robot type for each of the participating robotic head



If you are including Pan Bars in your Chat Pro system, ensure that you add them before any other robots. This will allow you to add the exact number of heads as in your Chat Pro license.

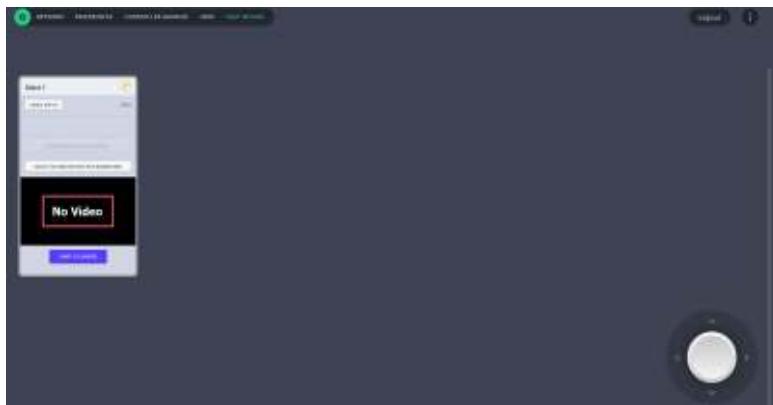
Note

If a selected robot does not go green, then check it is on the same IP address range as the server PC. The Find button does a network wide broadcast, therefore it finds heads even on different subnets.

Note

If an NDI protocol robot, such as that with a rig type of NDI_PTZ, is not being detected in Network setup page (turning green), then it is recommended that you download and install NDI Studio Monitor tool from NDI website. If the NDI Studio Monitor cannot detect the NDI protocol robot, then the Chat system will not detect it (as the Chat system uses the same source library as the NDI Studio Monitor for source detection).

3. Select Settings > **CHAT WIZARD**. This page shows the added robots as boxes where video feed from each of them can be set up.



4. Under **VIDEO INPUT**, select the source of the video feed.



5. Select the **DEVICE**. If the selected video input is **Decklink** or **USB device**, then **DEVICE** is the port receiving the video feed from the camera on the robot. If the selected source is **RTSP stream**, then add the RTSP stream address in the appearing box.

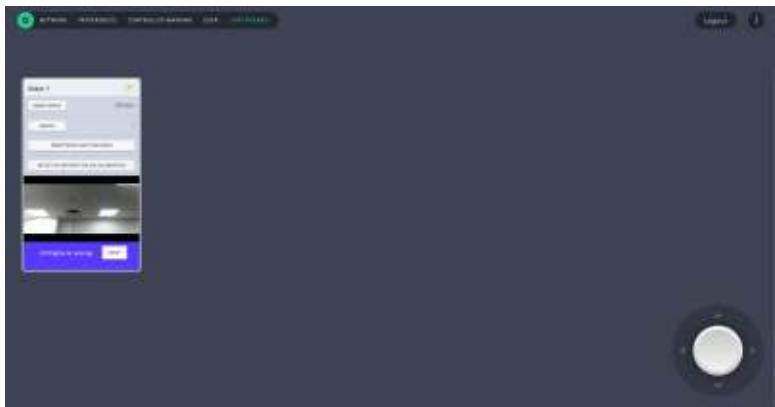


You can add up to 3 channels.

Tip

Use the on-screen joystick (pan-tilt) control to move the robot slightly for easily identifying the robot if you are not able to do so by the name of the robot.

6. Click **Start CV Engine** to start the program that enables Polymotion tracking in MHC. As you do so, notice that additional windows pop up, which can take up to 30 minutes; these windows are for MRMC CV Engine, a software application that runs in the background to enable Polymotion Chat, and must not be closed at any instance while using the system for accurate functioning.



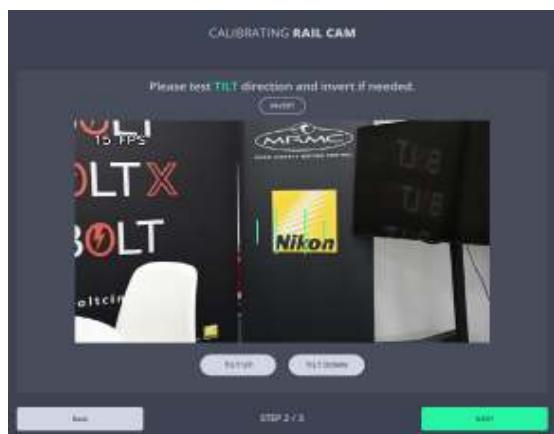
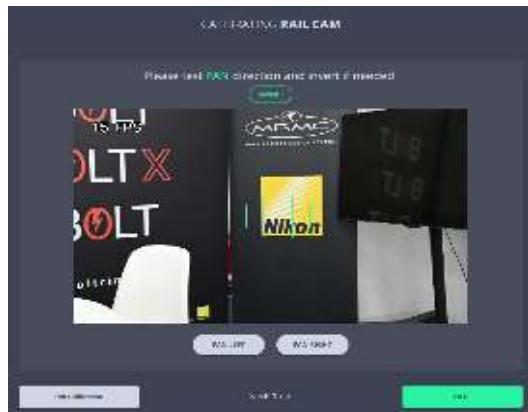
NDI video feed issues

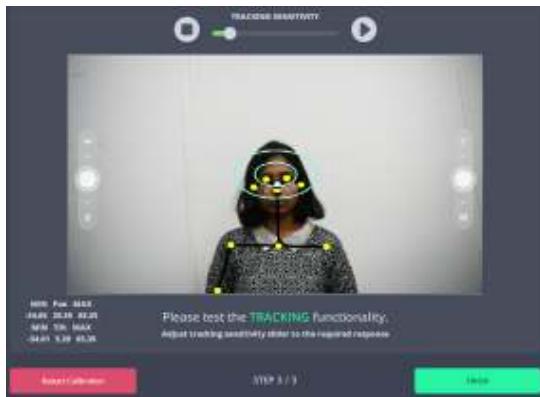
- If a video input was selected as NDI in Step 4 but is not displayed after clicking Start CV Engine, then it is recommended that you download and install NDI Studio Monitor tool from the NDI website. If the NDI Studio Monitor cannot detect the NDI video, then Chat system will not be able to detect it (as the Chat system uses the same source library as the NDI Studio Monitor for video source detection).
- On some servers or PCs, one of the two NDI heads or streams may not work if both NDI heads are connected to two different network ports of that server or PC. This issue can be resolved by connecting both NDI heads to a hub and then the hub to one of the network ports.

Note

After Polymotion Launcher installation, when CV Engine is started for the first time, a configuration process for graphics cards, called PoseNet Initialisation, is started which can take up to 30 minutes for a Dell 2U server and up to 20 minutes for a Dell 1U server. For each subsequent Polymotion Chat launch, this process will take only a few seconds. During PoseNet Initialisation, the video feed appears with a message “CVE PoseNet Initializaing”. After clicking ‘Start CV Engine’ for all participating heads, users are advised to wait for this message to disappear before using tracking functions in the Chat system.

7. Click **Directions and Tracking** to calibrate Pan and Tilt axes. The pan and tilt axes direction should be set accurately for accurate tracking. For this, use the on-screen joystick control to check whether the robotic heads are moving in the direction of the joystick.

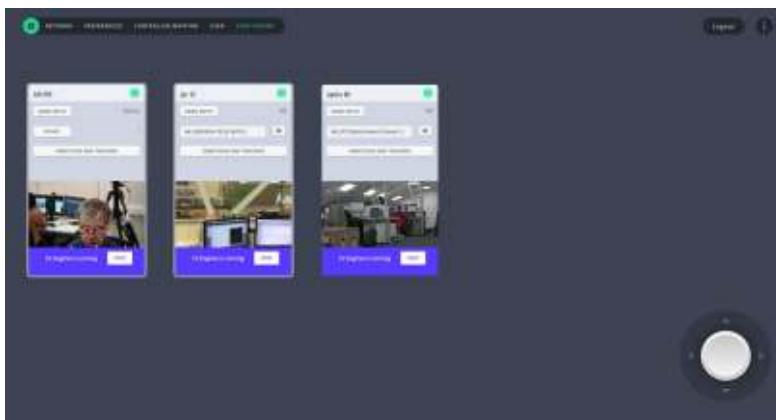




Click the **Home** button to home all axes; use the **Fix** button to fix any tripped axes, if required.

In this step, you can adjust the **tracking sensitivity** by clicking the play button to temporarily start tracking and then tweaking the sensitivity using the slider. To modify tracking sensitivity a person needs to be present in the frame to allow tracking to begin. If that is not possible, skip this step.

8. Repeat Steps 2-7 for all the robotic heads that are part of Polymotion Chat system.



Note

Log in as an Engineering type user. Use Settings  > User page to check whether one is already set up or create a new one.

Setting up the robotic heads for Polymotion Chat Pro

Provided all the participating robots are connected properly and video feeds from all the cameras are being successfully received and are correctly configured, your first session will involve logging in to the MHC Client.

Note

You can use the default ‘Operator’ or ‘Engineer’ account to log in to the MHC (Chat) Client display. Operator account allows access to all screens/settings except the Robot Settings page which includes the Polymotion and CV Engine tabs (refer to *Changing Tracking Settings in the Client View* on page 22). The default passwords are:

Username: **Operator**

Password: **password**

User name: **Engineer**

Password: **password**

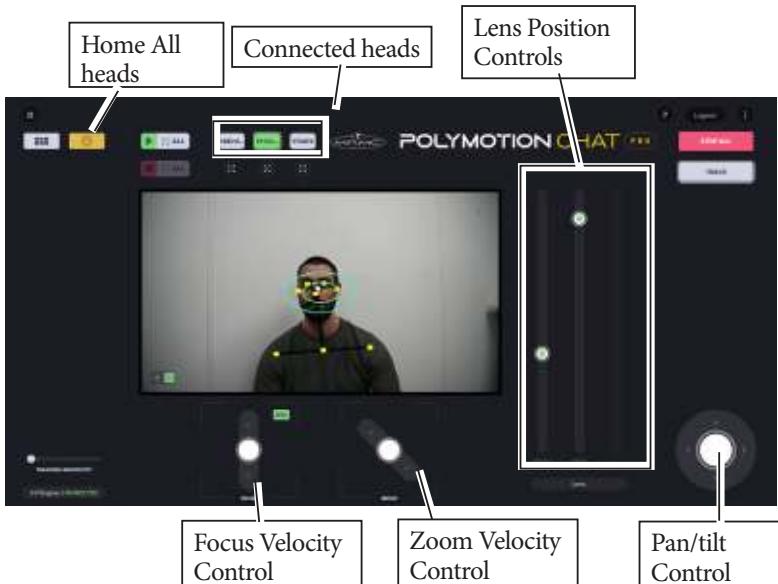


When you login to MHC Client, this multi-view screen view appears which shows the live feed from all the connected cameras. If you have only one camera, then it goes straight to the operator screen. You can

select the live feed from any camera to begin tracking and change the tracking settings for that camera.

For more detail on Multi-screen view, go to *Using the Multi-screen View (For Multiple Heads only)* on page 22.

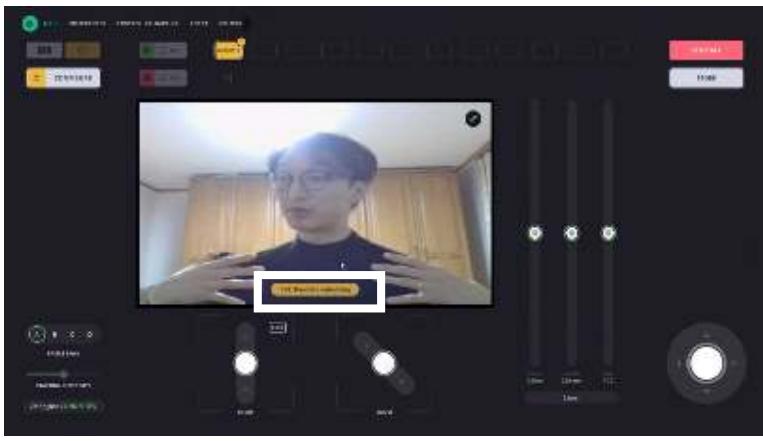
Polymotion Chat Pro Main page



The controls on the Main page can be used to move robotic head axes and set up and run presets which can be later used to follow targets automatically.

Note

When Chat Main page is started for the first time after Chat installation, the CVE PoseNet Initialization process is started and a message appears in the LiveView window. This process will continue for up to 30 minutes depending on the number of heads in your Chat configuration. For each subsequent launches, this will take only a few seconds. While this process is in progress, the tracking controls will not function in the Chat program.



Axes sliders and joystick controls

The Focus and Zoom Velocity sliders can be used to move the lens axes in either direction. They are velocity controls in that the further they are pushed the faster the axes move.

The Pan /tilt joystick control is a directional control for Pan and Tilt axes.

The Focus, Zoom and Iris sliders on the right are position controls in that they can be used to move the lens axes to specific positions shown by the markings as stored in the lens table for the lens physically installed on the robotic head. It is important that the lens table is set up properly in > **Robot>Lens tab** for these to function accurately.

Important

End stops on Focus and Zoom are not supported for Panasonic PTZ devices.

In order to get the pan and tilt end stops to work smoothly for Panasonic PTZ heads, Chat system uses the settings in the head. The applicable models incorporate an EEPROM for storing the settings, and each time a command that changes the settings is received, data is written in the EEPROM. The number of times data can be written in the EEPROM is limited so if data is sent frequently, the model will cease to operate normally when the maximum number of times for writing the data has been reached. Therefore, it is recommended that end stops are not changed frequently for PTZ heads to prevent EEPROM from failing.

Note regarding Panasonic PTZ Head Zoom Function

On the Panasonic PTZ head, if you are on a wide zoom setting, the head can focus quite closely, such as 0.5m. However when you zoom in to the telephoto end of the zoom, the closest the head focus is about 3m. The software in the Panasonic knows about this and will move the focus slider up when you zoom in.

Also if you are at the tight end of the zoom and try to move focus to a close position, the software in the head will not allow you to do this. It will move to the closest possible focusing distance.

Tracking Sensitivity

Tracking sensitivity determines how quickly the camera moves in reaction to the target moving away from the reference point, i.e. the deflection from the desired position. This feature gives better control over lower speeds. For example, when the slider is at the half way mark the sensitivity demand is only 20%. Use a high tracking sensitivity value for generally wide on zoom.

Tracking sensitivity automatically adjusts based on the lens FOV or zoom level. The more zoomed in the lens is, the less the camera is panned and vice versa. You should have the lens table set up for this to function accurately.

Setting pan and tilt soft limits

If the subject moved to an undesirable position, having set the soft limits will prevent the robotic head from moving further in that direction. Carefully set the soft limits for pan and tilt axes to prevent the robotic heads from moving to positions outside the desired area.



To set soft limits:

1. Use the joystick to position an axis at a point that you want to set as minimum limit.
2. Click the first SET button to set the minimum limit.
3. Similarly, position the axis at the point you want to set as maximum limits.
4. Click the second SET button to set the maximum limit.
5. Use steps 1-4 to set soft limits for the required axes in all the participating robotic heads. Use the arrows shown in the above picture to navigate between the robotic heads.

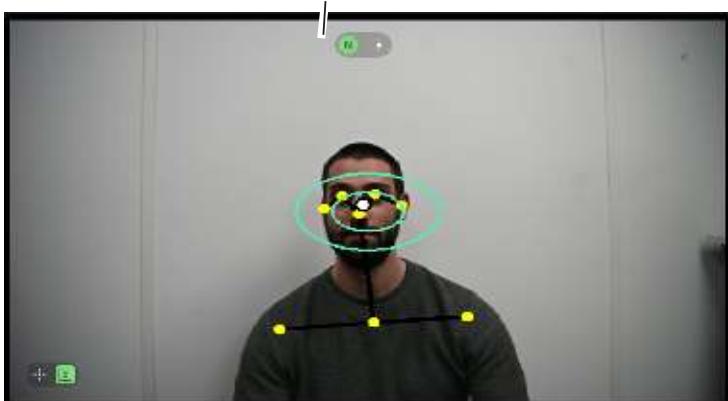
Note regarding Panasonic head's preference limits

All preference limits are cleared when Panasonic head is removed from MHC or added to MHC. Therefore, the user needs to re-set them when adding the head in MHC.

Tracking modes

Tracking modes allow you to set how much of the target(s) will be kept in the frame while tracking the target. Polymotion Chat Pro system uses auto framing for this. Depending on the set tracking mode, the Chat system works out the extent which the target will kept in the frame. This is called **autoframing**. In default tracking mode of 'Normal', autoframing is not applied. In all other tracking modes auto framed target is indicated by the yellow rectangle. The vertical green lines indicate the stop zone for autoframing. This can be adjusted by the zoom velocity control while in autoframing modes. In autoframing modes, the stop zone only applies to the pan axis, tilt is handled automatically.

Normal tracking mode applied



Tracking mode	Description
N	Normal tracking: Default tracking mode in which Chat system adjusts pan and tilt to keep the subject at a point in the frame.

Tracking mode	Description
	Head and shoulder tracking: This is an auto framing tracking mode in which the chat system adjusts the pan, tilt and zoom to keep only the head and shoulder of the target in frame. When using this framing type, you can use the positional zoom slider on the right to make fine adjustments to zoom position.
	Half body tracking: An auto framing tracking mode in which the Chat system keeps the half body up to the waist in the frame.
	1-person tracking: An auto framing tracking mode in which the Chat system keeps the full body of the target in the frame provided lens can zoom wide enough to capture the whole person.

Starting Tracking

Enabling tracking on a tracking preset does not automatically start tracking. There are three ways to begin tracking:

- **Using  for each head:** Use the MHC controls to position the head to the desired target and the click  to begin tracking the target.
- **Using :** Use the MHC or joystick controls to position the head(s) to the desired target and the click  to begin tracking the target for all heads.
- **Using  :** This button can be used to start tracking on the active head.

Once tracking has started, all tracking robotic heads have  appear under head select buttons. The tracking modes appear on the LiveView display allowing the user to dynamically change the tracking mode while the head is tracking.



Static zones

The green boxes or ellipses appearing on the target in LiveView are called static zones – inner zone and outer zone. The camera moves only as much to place the white dot representing the target inside the inner zone. When the target moves but is still inside the outer zone, the camera does not move. A smaller zone means target is more closely followed, resulting in more camera movement. A larger zone means less camera movement, as the target is free to move around without the tracking reacting.

Note regarding Birddog Autofocus function

When a preset is saved with AF on, enabling it and changing the AF state will not reflect in the preset when it is enabled again. This happens because of the preset memory function in the Birddog PTZ camera. If set to ON then the complete state of the head will be saved (including AF state) when a preset is saved. If set to OFF then only the pan, tilt, zoom and focus is saved to a preset. This needs to be turned off in the on-screen display. You can access the display via NDI Studio Monitor (password: birddog).

In the OSD, go to SYSTEM --> PRESET MEMORY --> OFF. Exit the menu and close NDI Studio Monitor.



Altering Static Zones

On the bottom left of liveview, switch allows you to toggle between **edit static zone** and **choose person** options. Use the appearing arrows and other options to edit the static zones as required, and then exit the edit mode. When the little framed person icon is selected the user can choose which person on screen will be tracked. Click on the person's face to select them to be tracked



Fine adjustment of autoframing zoom position

While auto-framing, if you move the zoom position control then two pairs of green horizontal lines appear in the live view. You can then fine tune the size of half body, zoom will then be adjusted by MHC to use the new size. The yellow box should fit to the green lines once the zoom had been adjusted. This is only a temporary setting, if you go to another preset, it is forgotten.



Motion Prediction

This adds a thin white line depending on which way the target is moving/facing and gives the tracking demand an extra boost depending on the level of the setting in the CV-Engine tab. For more information, refer to page 22.



Stopping Tracking

At any point, you can turn tracking off on all participating robotic heads by clicking/tapping .

You can stop tracking on the currently selected head by using the pan and tilt joystick control. As soon as you move the joystick the tracking will be disengaged. Another way of stopping tracking on individual robotic heads is by clicking/tapping under the head-select button.

can be used to stop all movement on all robots, akin to an emergency stop button.

Using the Multi-screen View (For Multiple Heads only)

Click/tap the Multi-screen view (≡) button to view the live video feed from up to 12 connected heads. This view is available only when you have more than one connected head. You can click the view from any of the connected heads to switch to viewing the feed from that head in the main LiveView window. The presets visible on the screen will be for the head you have selected.

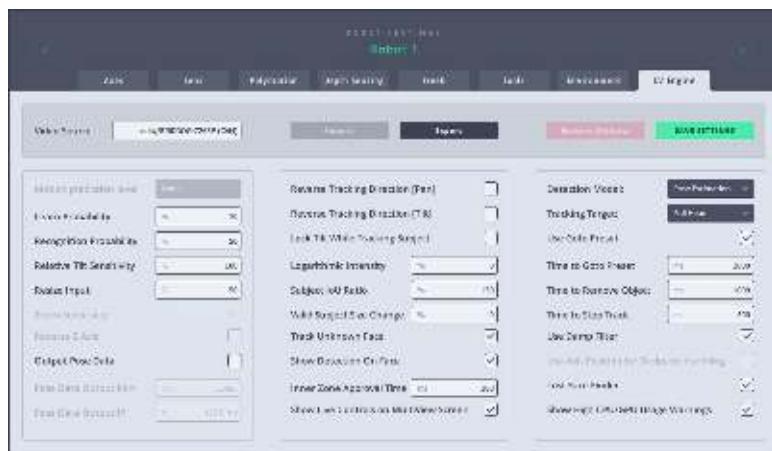
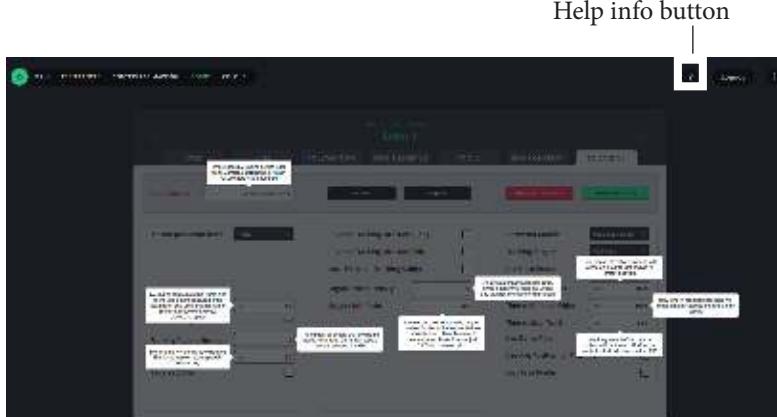
Selecting a head will not alter the current tracking settings on any other head. In other words, the tracking options and presets are head-specific.



Changing Tracking Settings in the Client View

If you want to quickly change some tracking options whilst you are logged in as a engineer-type user, you can use the ⚙ > ROBOT > CV Engine tab.

Click ⓘ on top-right to display info boxes for all fields.



Video Source: Use this box to change the Video Input for camera tracking. Simply enter the name of the input stream along with the port number (**x**):

- USB: **Camerax**
- Decklink: **DeckLinkx**
- RTSP: RTSP stream address

- NDI: NDI stream address

Motion prediction level: Level of prediction of direction of target movement. Default is None and can be set to Low, Medium or High.

Resize Input: CV Engine can reduce the frame size of the captured video. If resize input is over 50% then CV-Engine will run slowly.

Motion prediction level: Level of prediction of direction of target movement. Default is None and can be set to Low, Medium or High. Applicable to MRMC heads only.

Learn Probability: New face image probability lower than this value will be learnt and added to the library.

Recognition Probability: Confidence threshold for a face recognition to be considered valid.

Relative Tilt Sensitivity: A factor to control the tilt movement in relation to the pan.

Resize Input: CV Engine can reduce the frame size of the captured video. Reduce this value to increase the processing speed. If resize input is over 50% then CV-Engine will run slowly.

Zoom Sensitivity: Sensitivity of zoom during auto-framing. This is based on zoom speed in axis settings.

Reverse Z axis: Toggle switch to reverse direction zoom axis in response to the moving subject.

Reverse Tracking Direction [Pan]: Reverse the direction of pan in response to moving subject.

Reverse Tracking Direction [Tilt]: Reverse the direction of tilt in response to moving subject.

Lock Tilt While Tracking Subject: When this option is turned on the robot should not tilt after the target is inside the inner stop zone.

Logarithmic Intensity: This will cause the robot to move slowly when the target is at the centre of the screen and quickly at the edge.

Subject IoU Ratio: Intersection Over Union Ratio. This is how closely you want to follow the target. It compares the bounding box of the current target with the bounding box of target in the previous frame. The default is 150% overlap, which means the position between frames is allowed to be 50% off, otherwise it is considered to be a different person.

If the target is moving around quickly you need a large IoU so that the tracking is able to hold on to the target. The drawback is that the larger the IoU, the greater the chance of the tracking jumping to a different target. Hence a small IoU, such as 110% will reject false targets but will lose the intended target if they move quickly.

Valid Subject Size Change: This setting is the minimum target size filter and allows the user to set the size of the target to be detected. Default is 0, which means the setting is off, and any target will be detected regardless of size. However, it is advisable to set it at a non-zero value. For example, if a target in the background is less than half the size of the main subject, and the value is set at 50%, they will not be detected.

Track Unknown Face: When checked an unknown subject is tracked even when it is not recognised.

Show Detection on Face: When checked tracking points and lines on face are shown.

Inner Zone Approval Time: Duration in ms when the subject is confirmed to be in the inner stop zone.

Show Live Controls on MultiView Screen: Toggles showing of tracking controls on MultiView video windows.

Detection Model: Indicates whether the robotic head is a tracking head or non-tracking head.

Tracking Target: Position of the detection point (White dot), derived from the pose estimation points.

Use Goto Preset: Turning this feature on will move the robotic head to the preset position when the target is lost for more than the time set in Time to Goto Preset field.

Time to Goto Preset: How long in milliseconds after losing the target that the tracking will cease and camera will go to preset position.

Time to remove Object: This is the amount of time from when the target is lost to when the robotic head returns to the preset.

Time to Stop Track: This is the amount of time from when the target is lost to when the robotic head stops moving the motors.

Use Damp Filter: Turning this feature on will smooth out the robotic head movement when the target goes out of the outer stop zone.

Use Axis Position for Tracking: Turning this feature on will use the axis position of the robotic head to improve tracking performance.

Lost Face Finder: Automatically move the tilt upward if the subject suddenly moves out of the top of the frame.

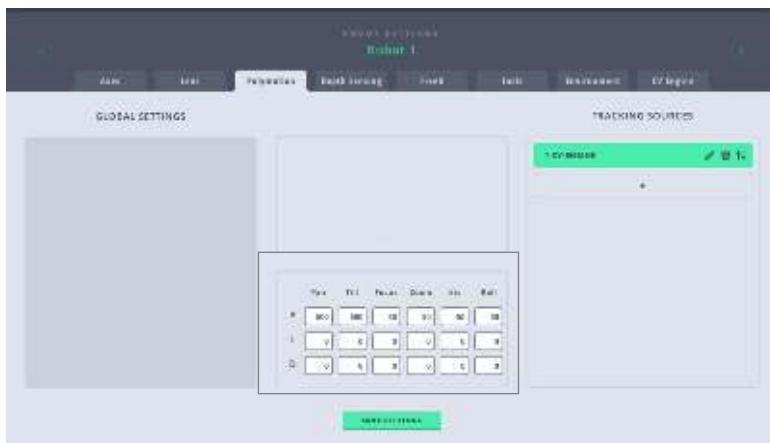
Restore Defaults: Restores to factory default settings.

SAVE SETTINGS: Saves the settings to the current configuration.

Export: Allows you to export the settings to a file. Navigate between heads to save settings for different heads.

Import: Import settings from a file.

Polymotion Tab Settings



The tracking settings are normally not changed and should be left at '100%'.
27

Appendix 1 Polymotion Chat Pro Installation

Minimum Hardware Specifications

- Operating System: Windows 10
- CPU: I7 or equivalent
- Graphics Card: NVIDIA GTX1080 or greater (GPU must be NVIDIA to support CUDA)
- RAM: 16GB

Recommended Hardware Specifications

- Operating System: Windows 10
- CPU: I9 or equivalent
- Graphics Card: NVIDIA RTX4000 (GPU must be NVIDIA to support CUDA)
- RAM: 32GB

Additional Hardware Requirements

- Storage: 512GB SSD
- Video Ingest: AJA U-Tap
- The host PC has to have on board graphics on the motherboard which must be capable of running OpenGL 4.3 or higher

Installing Polymotion Chat

1. Set up the PC with a static IP address.
2. Using Black Magic Desktop Video setup software to reconfigure all the connectors on your Decklink card to be inputs.
3. Install the two main components of the Chat system, CV Engine and Polymotion Launcher. Use the correct installers depending on the system targeted for deployment:

- Installer files required for Dell Server based Chat System [Approx. 2.5GB]
 - MHCPolymotionLauncherSetup_x64-v3.0.0.2
 - CV-Engine_Setup_Server_v3.0.exe
 - CV-Engine_Setup_Server_v3.0-1.bin
 - CV-Engine_Setup_Server_v3.0-2.bin
- Installer files required for light installation [Approx. 2GB]

Note

Light installer is used for upgrading an existing Chat System or Systems with correct graphic drivers pre-installed.

- Polymotion Launcher
- CV-Engine_Setup_Light_v3.0.exe
- CV-Engine_Setup_Light_v3.0-1.bin
- CV-Engine_Setup_Light_v3.0-2.bin

Configuring the Polymotion System

Steps in this section are performed by MRMC as part of the factory settings. However, operators can use these as a reference when troubleshooting any issues should they occur.

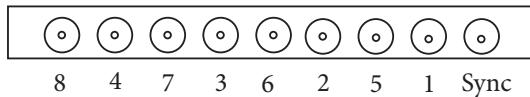
Configuring the Blackmagic DeckLink cards

If you are using Blackmagic Decklink cards for receiving the video feed in your Dell 2U server, ensure that the DeckLink receiver in the media server is configured for receiving the SDI feed from the connected cameras.

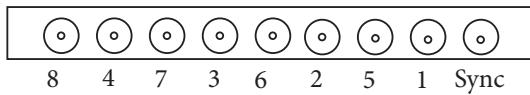
For optimum performance of the Polymotion system, you can have up to five SDI channels connected to the media server.

The port numbers configured by MRMC in the DeckLink cards (from left to right) are:

Card 1



Card 2



If this data does not accurately appear or does not correspond to the cards that are actually cabled to receive a video input from a camera, then refer to the Troubleshooting section for a workaround.

Installing Polymotion Launcher

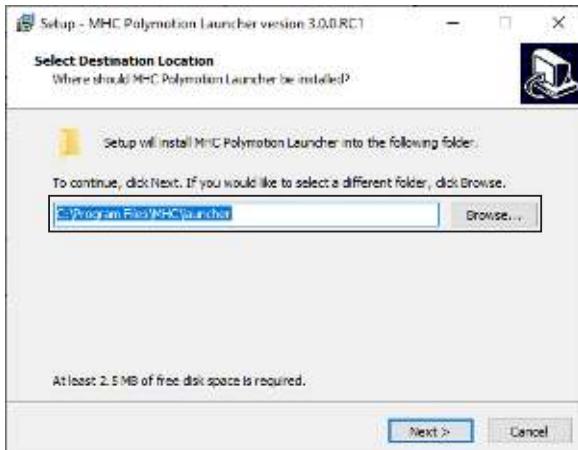
Polymotion Launcher is a utility that allows you to install additional instances of MHC corresponding to each Polymotion system, such as Polymotion Chat and Polymotion Player. Follow the instructions to install Polymotion Launcher:

1. Double-click **MHCPolymotionLauncherSetup_x64-v3.0.0.RC3.exe** to launch the installer for 64-bit OS installation.

Caution

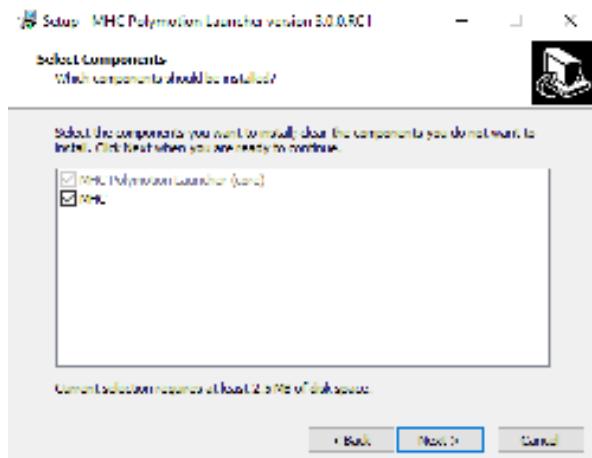
MHC v3.0 doesn't support backward compatibility from 64-bit to 32-bit installation.

2. If not already removed, delete the MHC Server and MHC Client shortcuts from the Desktop screen.
3. If not already removed, delete the MHC Server and MHC Client shortcuts from the Desktop screen.
4. Specify the location of the MHC application on your hard drive. By default it is installed in **C:\Program Files\MHC\Launcher**. Click **Next..**

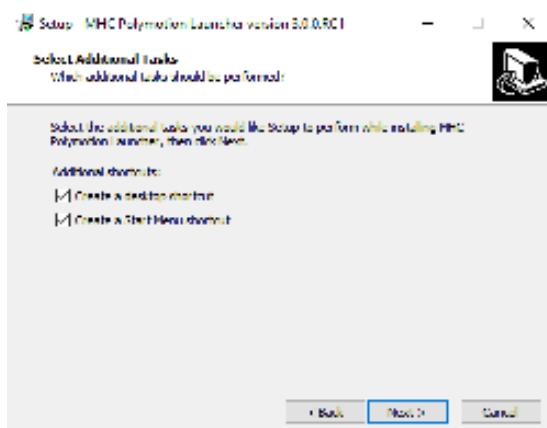


Polymotion Chat Pro 3.0 Quick Start Guide

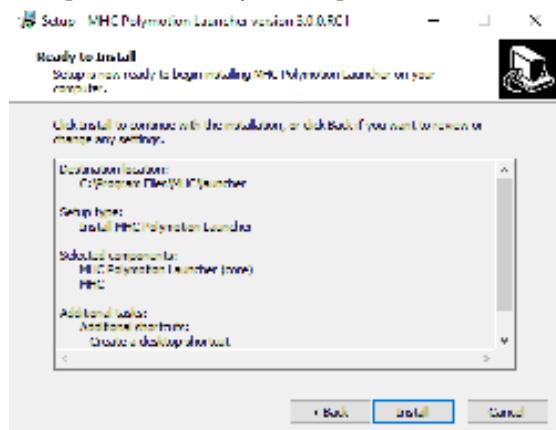
5. On the next screen, select MHC. Click Next.



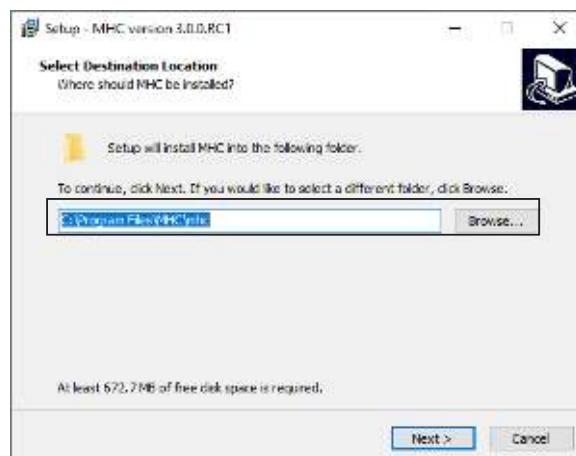
6. Click Next.



7. The next screen summarises the components selected for install. Click **Install** to install the MHC Polymotion Launcher (Core) - the default component of all Polymotion products.

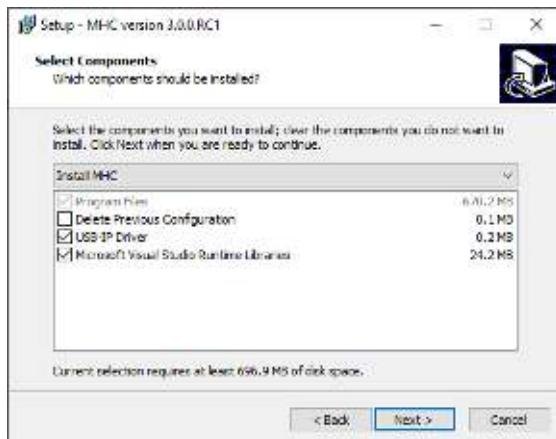


8. Ensure that you choose the install location as one within the MHC folder to install MHC. Click **Next**.

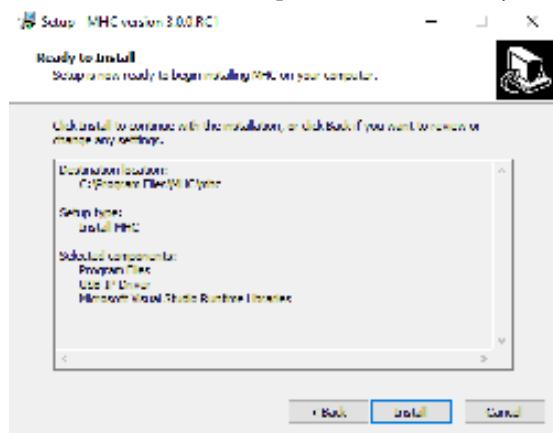


9. Specify whether the installation is upgrade or a new installation and select components to install. The installer auto-selects the

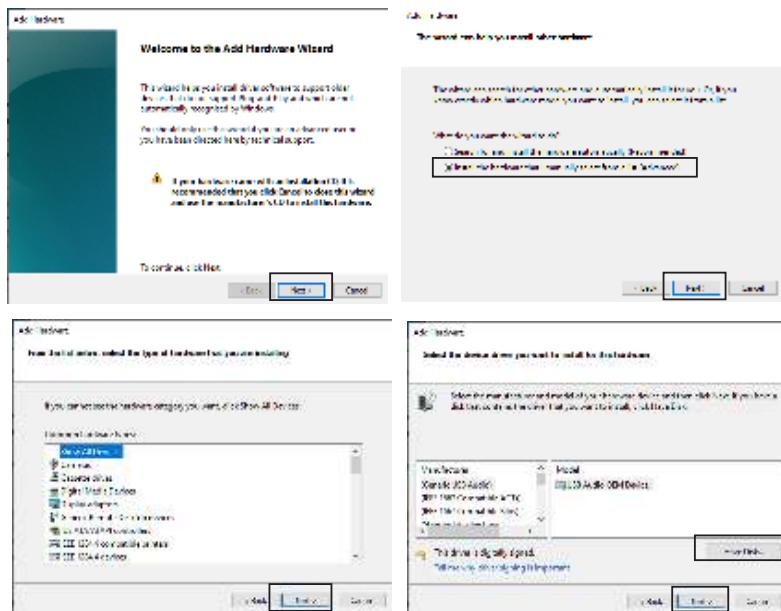
components depending on whether its a new installation or an upgrade.



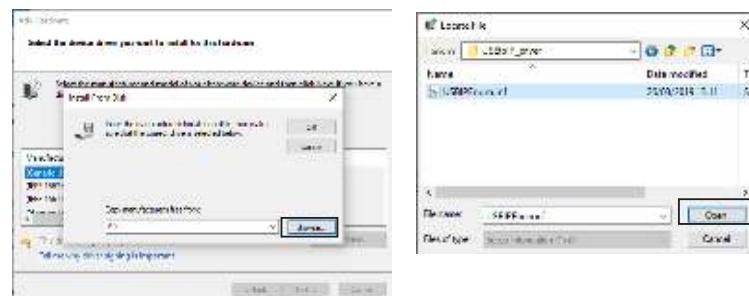
10. The next screen shows the components that are ready to be installed.



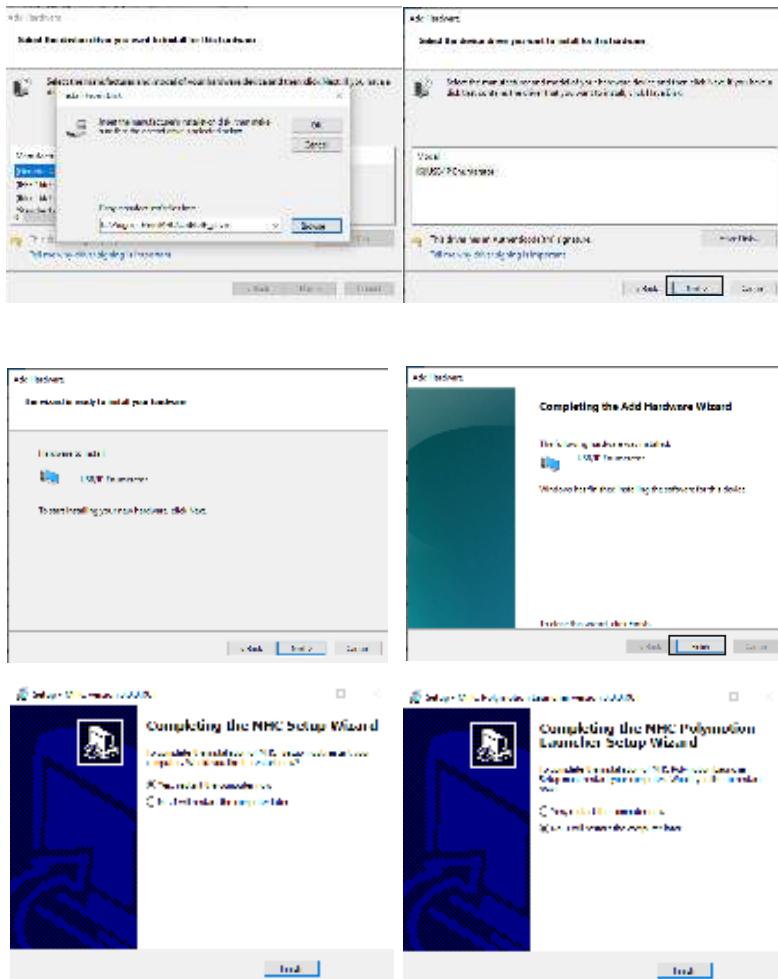
11. Follow the on-screen instructions.



12. Click **Browse** and navigate to C:\Program Files\MHC\USBtoIP_driver\USBIPEnum.inf.



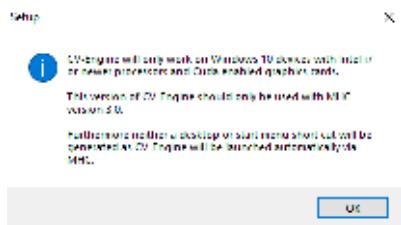
Polymotion Chat Pro 3.0 Quick Start Guide



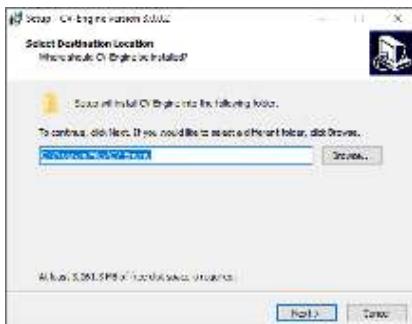
Installing CV Engine

1. After installing Polymotion Launcher, double-click **CV_Engine_Setup_Server_v3.0.0.2.exe** to start the installation. When a message appears asking for confirmation, click **Yes**.

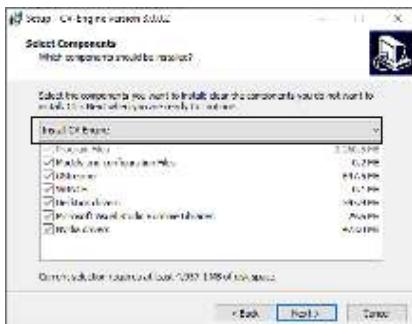
2. Click **OK** on the Setup message.



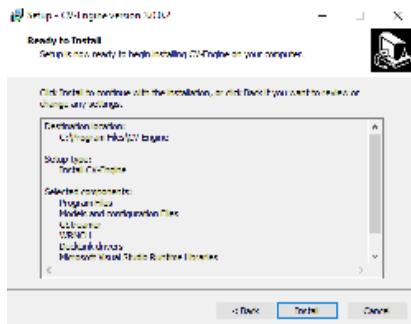
3. Select the installation folder and click **Next**. You should normally not need to change the default path.



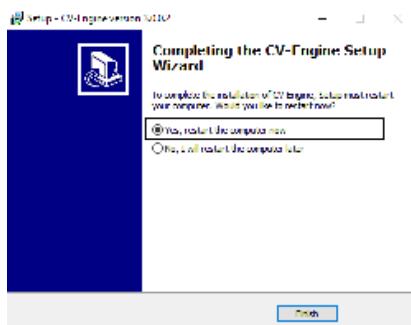
4. Click **Yes** if a message appears that the folder already exists.
5. Click **Next** to conform installation of all the components. If this is not a new installation and you want to upgrade an existing installation, select Upgrade CV Engine from the dropdown list.



6. Click **Install** on the next screen of the installation wizard.

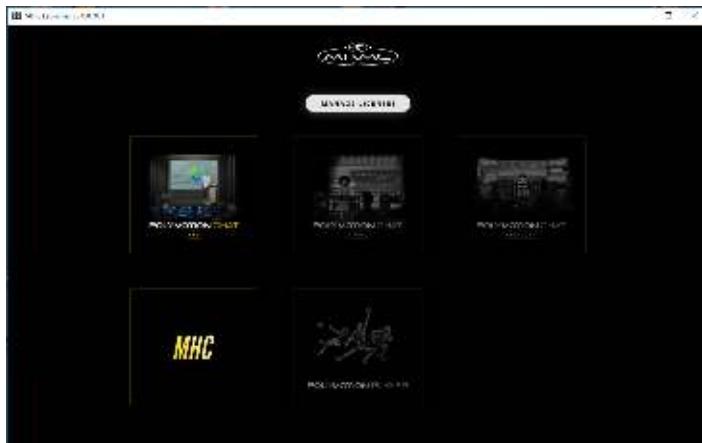


7. It is recommended that on the final screen you select the option to restart the computer and click **Finish**.



Licensing your Polymotion Product

If you have recently installed MHC, when you launch MHC Polymotion Launcher, click **Manage Licenses**.



On the Licenses window, click the Copy button the bottom of your MHC screen to copy the UID and paste it your license request including any other products such as Polymotion Chat or Polymotion Player to broadcast.support@mrmoco.com.



On the receipt of your license file, save it on to the disk, launch Polymotion Launcher. Click the **Add new licence file** button and select the new license file. Once the license is added, you will be ready to use the product.

WRNCH Licensing

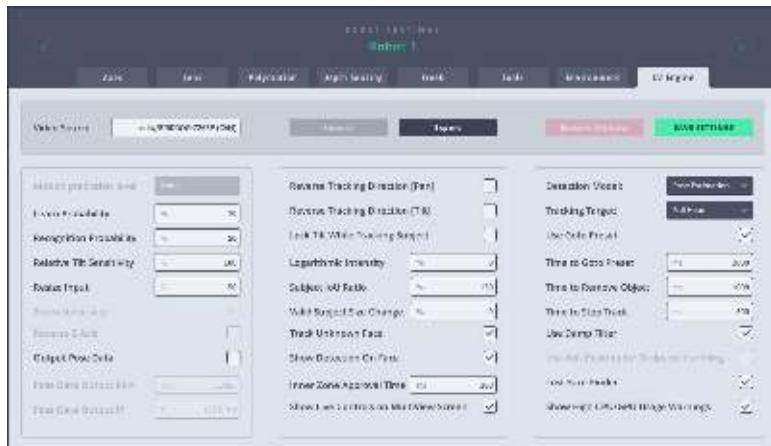
To be able to use motion tracking with MRMC Polymotion products, you require an updated WRNCH license. This license is fixed to the machine hardware (motherboard and network device) and is permanent until 14 September 2022 to the node with Polymotion Chat Pro systems installed at the factory. After this date, perform the following to update the license:

1. After the complete installation of Polymotion Chat and CV Engine, run utility zlmhostid.exe (download available from TBC) on the host PC.
2. Utility will generate text file **zlmhostid.txt**. Text file will be saved to the folder from which the utility was run. Append the name of the file with PC name and Company name, for example **zlmhostid_PC79_mycompany.txt**.
3. Email the text file to Broadcast.Support@mrmoco.com along with your customer details.
 - 3.1 MRMC will then process this and email you an additional license file. **Note** that this process may take a couple of days.
4. Copy the license file you receive into folder “C:\Users\<user name>” (where <user name> reflects your user details).
4. Restart your PC and Launch Polymotion Chat.
 - 4.1 Polymotion Chat will now be fully licensed and ready to use.

Note: a future version of Polymotion Chat/CV Engine will remove the need for this additional licensing step.

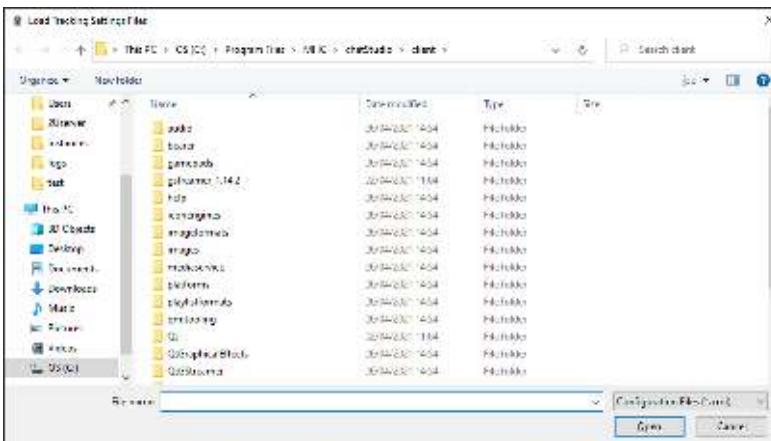
Backup and Restore CV Engine Settings

The four buttons at the top of CV Engine tab allow you to backup and restore CV Engine settings.



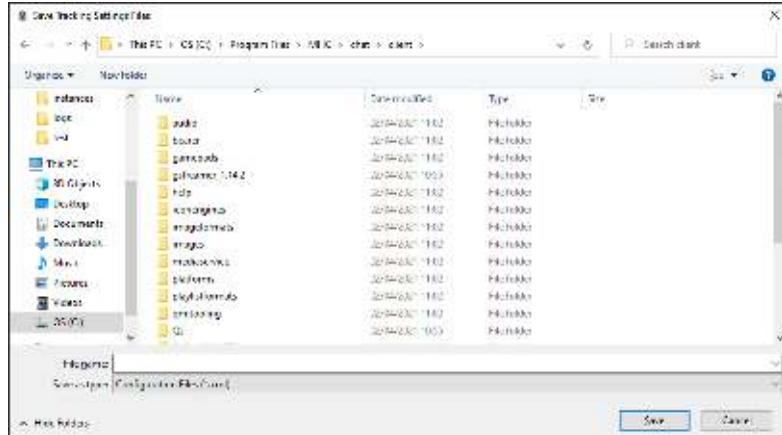
Import

Clicking the Import button opens a new window. If you had already exported your tracking settings for a head as a `<Your_CV-Engine_config>.xml` file using Export button before, you can import the exported settings.



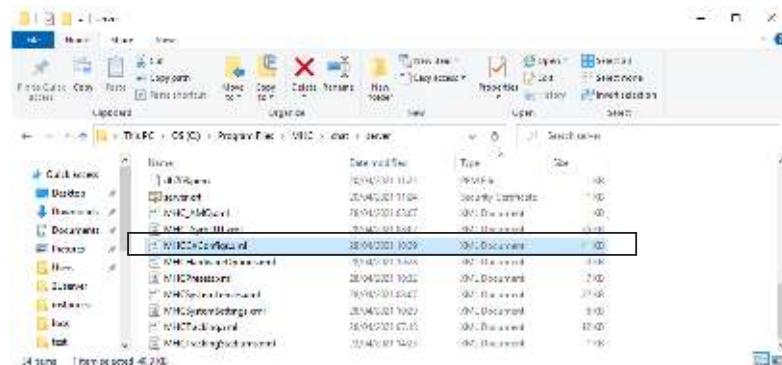
Export

When you want to back up your current tracking settings, you can export an XML file using the Export button. Later, you can load the settings using the Import button. Note that the Chat software version from which you exported the setting must be identical to the one you import.



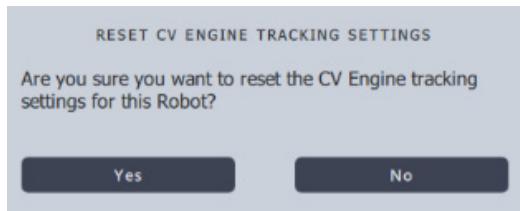
Save Config

Clicking Save Config button will save CV Engine settings in `<path to MHC server>\MHCCVConfigs.xml`. If you want to back up current tracking settings of all heads and load it up later, you can copy `MHCCVConfigs.xml`, and load settings later using the Import button.



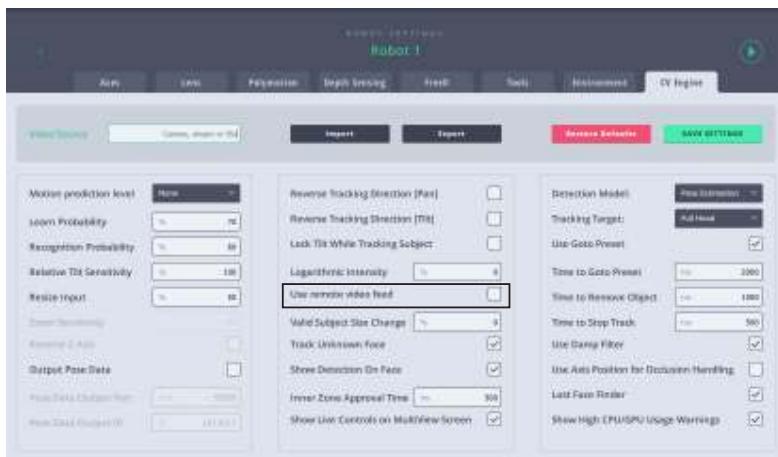
Restore Defaults

After clicking the Restore Defaults button, you will be prompted for confirmation if you really want to reset all CV Engine config. A confirmation will remove all your current settings and restore factory default values. So remember to export the settings if you need a backup because “MHCCVConfigs.xml” file saved by “SAVE SETTINGS” button will also be cleared up.



Remote Client Configuration

1. Install MHC as normal on the MHC Server machine and note that machine's IP address.
2. Install MHC with the "Client only" option on the remote client.
3. Start up client and server on their respective machines.
4. In the CV Engine tab of a MHC client, select Use Remote Video Feed.



5. If multiple servers are detected then a popup will appear to select the desired MHC server IP. Select the correct MHC server and click SELECT.



However, if there's only one MHC server detected, a confirmation popup appears.



MHC has now automatically configured remote video feeds for all robots.

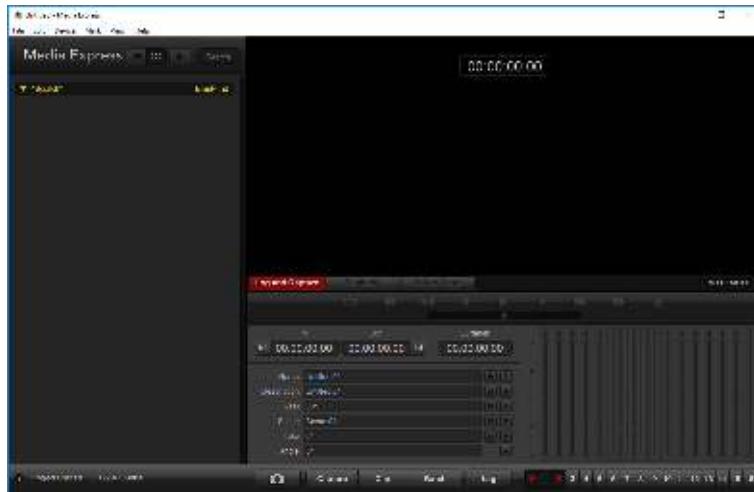
6. Go to Chat wizard and setup the required video input feed in to CV-Engine.

Appendix 2 Troubleshooting

Resolving Video Feed issues

Blackmagic Media Express can be used to verify that video feeds are connected to the correct input ports. Use the device menu to switch between inputs and view the incoming video feeds. Make sure that incoming video format is compatible with the installed Blackmagic Video Ingest card:

1. Open Blackmagic Media Express from the Windows Start Menu.
2. Select **Device > DeckLink Duo (n)**, or the port that has connection issues.
3. Select **Log and Capture** tab.



Step through the other ports to find a misplaced video feed.

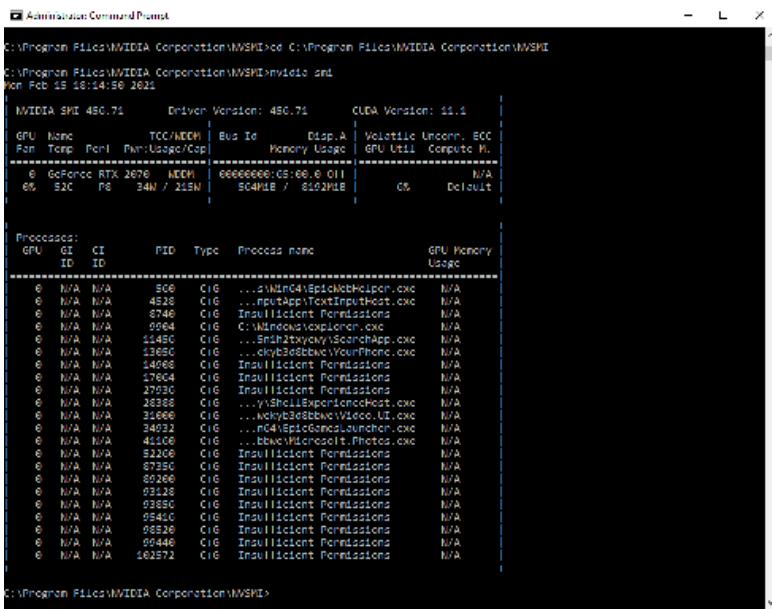
Handling Lost Video Feed Issue

There is a known issue with driving Nvidia cards at high usage on Windows10. If the GPU usage is over 85% for extended periods there is a likelihood of the GPU crashing. If the GPU is from the Quadro range of cards, it can be put in to TCC mode using the following steps:

Note

For a stable CVengine, the Graphics card should be on TCC mode.

1. Press the windows key then type “cmd”.
2. Right click on “Command Prompt” then select “Run as administrator”.
3. Go to the Nvidia SMI directory with "cd "\Program Files\NVIDIA Corporation\NVSMI”.
4. Type in the command “**nvidia-smi**” and you should get a print out of information regarding the nvidia graphics cards.



The screenshot shows the output of the **nvidia-smi** command in an Administrator Command Prompt window. The output provides detailed information about the GPU, including its name (NVIDIA SMI 480.71), driver version (480.71), and CUDA version (11.1). It also lists various processes running on the GPU, their IDs, and memory usage. The GPU is identified as an GeForce RTX 2070 with 8GB of VRAM.

```
C:\Program Files\NVIDIA Corporation\NVSMI>cd C:\Program Files\NVIDIA Corporation\NVSMI  
C:\Program Files\NVIDIA Corporation\NVSMI>nvidia-smi  
Mon Feb 15 18:14:58 2021  
  
NVIDIA SMI 480.71    Driver Version: 480.71    CUDA Version: 11.1  
GPU Name     TCC/MEM Bus Id  Disp A  Volatile Uncorr. ECC  
Fan Temp  Perf.  Power-Usage/Cap  Memory Usage  GPU Util Compute M.  
-----  
0 GeForce RTX 2070  8GB   0000:00:00:00  00:00:00.0 011  N/A  
8%  52C  P8  34W / 215W  8G4M8 / 8192M8  0%  Default  
  
Processes:  
GPU ID CI PID Type Process name          GPU Memory Usage  
ID ID  
-----  
0 N/A N/A 500 C/G ...smiNv4BpclkcbHlpon.cxx  N/A  
0 N/A N/A 4528 C/G ...inputApp\TextInputHost.cxx  N/A  
0 N/A N/A 8740 C/G Insufficient Permissions  N/A  
0 N/A N/A 9964 C/G C:\NvNdoz\explorner.cxx  N/A  
0 N/A N/A 11480 C/G ...Smth2ttxvcv\SearchApp.cxx  N/A  
0 N/A N/A 13680 C/G ...cky3d3bbkw\YourPhone.cxx  N/A  
0 N/A N/A 14068 C/G Insufficient Permissions  N/A  
0 N/A N/A 17664 C/G Insufficient Permissions  N/A  
0 N/A N/A 27936 C/G Insufficient Permissions  N/A  
0 N/A N/A 28184 C/G ...vSocialExperienceCore.cxx  N/A  
0 N/A N/A 28680 C/G ...vSocialExperienceUI.cxx  N/A  
0 N/A N/A 34631 C/G ...ncl4EpicsSmartLauncher.cxx  N/A  
0 N/A N/A 41100 C/G ...bbw\Microsoft.Photos.cxx  N/A  
0 N/A N/A 52060 C/G Insufficient Permissions  N/A  
0 N/A N/A 52350 C/G Insufficient Permissions  N/A  
0 N/A N/A 80260 C/G Insufficient Permissions  N/A  
0 N/A N/A 93128 C/G Insufficient Permissions  N/A  
0 N/A N/A 03650 C/G Insufficient Permissions  N/A  
0 N/A N/A 05410 C/G Insufficient Permissions  N/A  
0 N/A N/A 08528 C/G Insufficient Permissions  N/A  
0 N/A N/A 09448 C/G Insufficient Permissions  N/A  
0 N/A N/A 162572 C/G Insufficient Permissions  N/A  
C:\Program Files\NVIDIA Corporation\NVSMI>
```

- It will tell you if the card(s) are in TCC or WDDM mode. We want TCC mode.
5. For the first graphics card type in the command “**nvidia-smi -I 0 -dm 1**” to enable TCC.

6. For a second card use “**nvidia-smi -I 1 -dm 1**” to enable TCC.
7. Reboot the system.
8. Finally, use the “**nvidia-smi**” command again to check the card(s) has been correctly set to TCC mode.
- 9.

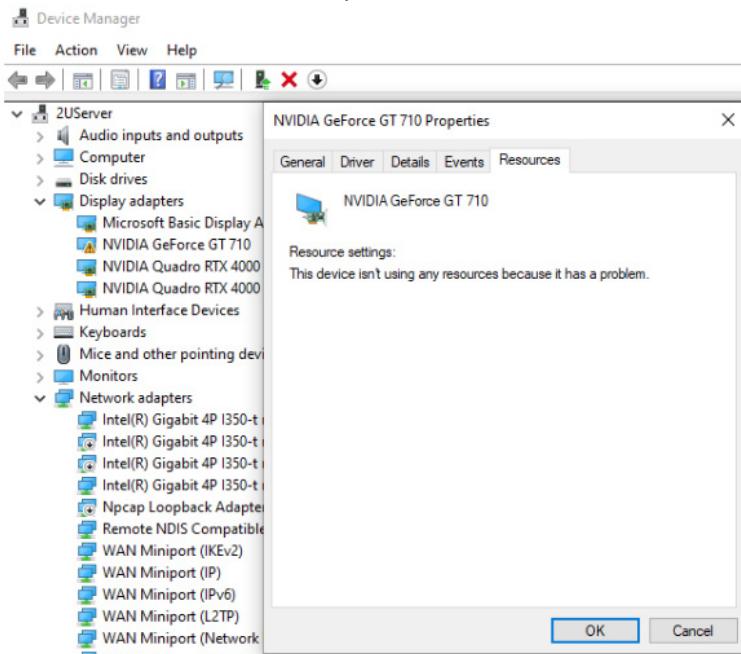
Note

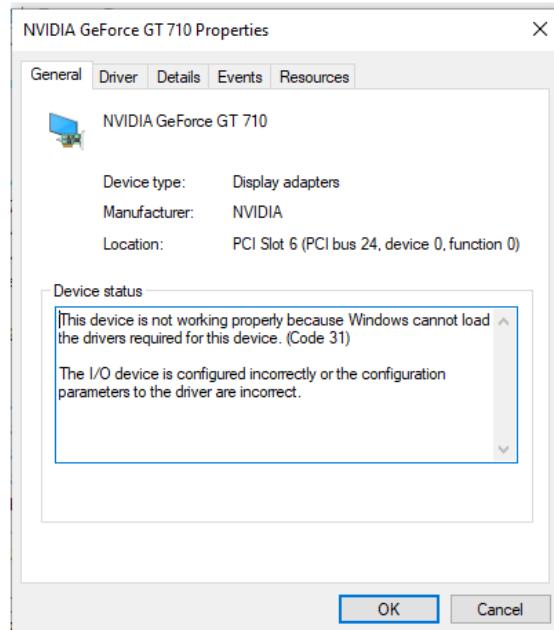
When a card is in TCC mode it is in “compute only” mode so cannot be used by Windows as a graphics card. So, you must have another graphics card in the system that is non-TCC mode. It is recommended that this non-TCC mode card should not be an Nvidia card but must be able to run OpenGL 4.3 or better. This is so CV-Engine will ignore it a resource for Computer Vision processing, so it is free to handle Windows graphics tasks.

Graphic Card Device Driver Issues

The CV Engine install restarts your system and after this has happened you should verify in the Device Manager display adapters that your cards

are not showing driver errors like the one below. If they are, then uninstall the device driver and then restart your machine.





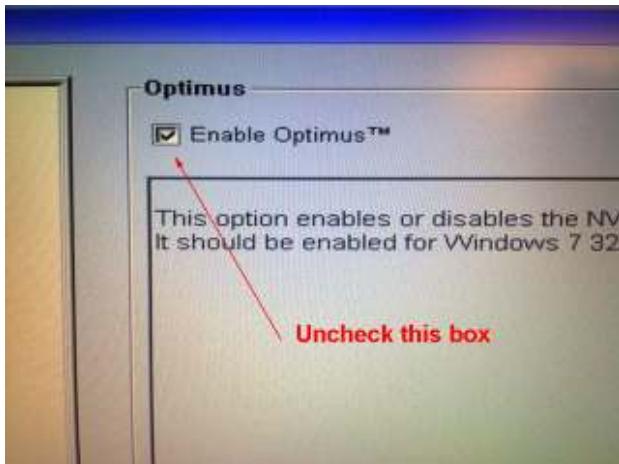
Handling Nvidia GPU issues

Problem: When trying to run Chat software on laptops with Nvidia Optimus technology, the application crashes or will not run properly.

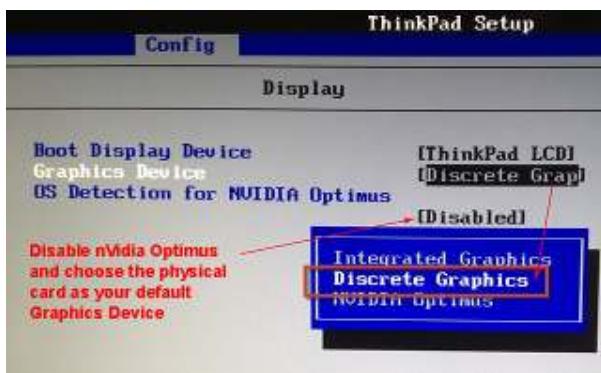
Solution: Disabled the Optimus technology in the BIOS for laptops having RTX-20XX series and the RTX-30XX series GPUs with Max-Q variants.

1. Restart your laptop and enter the BIOS before boot. Entering the BIOS will be different with multiple manufacturers but it is typically F2 or DEL. Refer to your User's Guide for more information on how to do this.
2. Locate the video configuration tree or config options screen in your BIOS that refers to your Optimus Video configuration. You will need to choose the option to disabled Optimus by either unchecking a box, choosing DISABLE as an option, or choosing the graphics card instead of the integrated card (nor Optimus.)

You may have to refer to your User's Guide to do this. Provided are a couple of BIOS examples from Dell and Lenovo laptops, respectively:



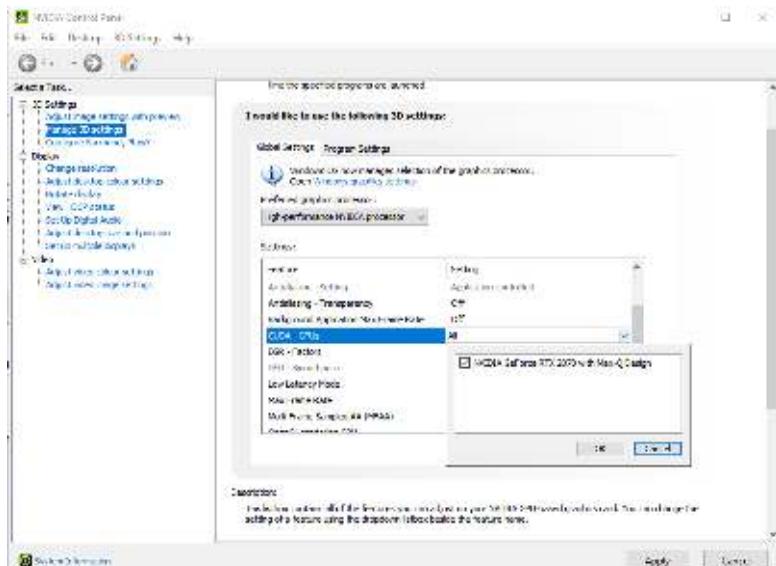
OR



If these options are not available in the BIOS, perform the following:

1. Launch NVIDIA Control Panel.
2. Under Manage 3D settings, change the Preferred graphics processor to **High-performance NVIDIA processor**.

3. In Settings, select CUDA-GPUs --> All, ensure that the **NVIDIA RTX 20xx with Max-Q** is checked.
4. Click OK and Apply.



Notes

Notes



Mark Roberts Motion Control Ltd.
Unit 3, South East Studios, Blindley Heath, Surrey RH7 6JP
United Kingdom
Telephone: +44 (0) 1342 838000
info@mrmoco.com
www.mrmoco.com

