

# WHAT'S NEW IN VICON TRACKER?

## WHAT'S INSIDE

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## About this guide

# About this guide

This guide includes the following information:

- Product information that you need to get started using the current release of Vicon Tracker
- New features and functionality included in Tracker 3.10.
- Prerequisites and any limitations
- Known problems

For information on installing and licensing, see Installing and licensing Vicon Tracker in the *Vicon Tracker User Guide*.

For further assistance, contact [Vicon Support](#)<sup>1</sup>.

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<sup>1</sup> <mailto:support@vicon.com>

## About Vicon Tracker

Vicon Tracker is a powerful object-tracking solution, providing unrivaled data accuracy for integration into 3D applications. It enables you to use Vicon camera hardware for tracking rigid bodies, accurately streaming 6 Degree of Freedom data in real time with very low latency.

Tracker 3.10 is a point release that includes several new features and enhancements. Details of the new features of Tracker 3.10 are described in [Tracker 3.10 new features and functions on page 10](#).

For information on preparing to use the latest version of Tracker, see:

- [Requirements for Vicon Tracker on page 5](#)
- [Install Vicon Tracker on page 7](#)
- [About Vicon Tracker licensing on page 8](#)

## About Vicon Tracker

\ Requirements for Vicon Tracker \

## Requirements for Vicon Tracker

Tracker 3.10 is supported under the following operating system:

- **Microsoft Windows 10, 64-bit** (this is the Vicon-recommended OS):  
Compatible with and fully supported. Installation, software operation and required third-party drivers tested.

Although Tracker may install and function under other Microsoft Windows operating systems, this is not officially supported or recommended by Vicon.

Tracker works with data from Vicon systems (including Vicon Valkyrie, Vicon Vero, Vicon Vantage and Bonita cameras and units). It is also compatible with the Vicon Virtual System, enabling you to integrate it into your software without having to use a camera system.



### Caution

For Tracker 3.10 and later, the use of MX T-Series cameras is not supported or tested. Use of these cameras with Tracker 3.10 and later is at your own risk.

Note also that if you add Valkyrie cameras to a system that includes T-Series cameras, the T-Series cameras will not work.

## License servers

If your organization licenses its Vicon product(s) from a server, ensure that the server meets the following criteria:

- It is unlikely to be powered down.
- It has a static IP address, so client machines can find it easily and reliably.
- It is unlikely to have its hardware configuration changed, especially the HDD and NICs.



### Tip

A pre-existing server in your organization is likely to fulfill the above criteria.

## About Vicon Tracker

\ Requirements for Vicon Tracker \

### PC requirements

For the most up-to-date information on hardware requirements for running a Tracker system, visit the [PC specifications](#)<sup>2</sup> page on the Vicon website, or contact [Vicon Support](#)<sup>3</sup>.

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<sup>2</sup> <https://www.vicon.com/support/faqs/?q=what-are-the-latest-pc-specifications>

<sup>3</sup> <mailto:support@vicon.com>

## About Vicon Tracker

\ Install Vicon Tracker \

## Install Vicon Tracker

Tracker 3.10 automatically installs into its own (Tracker3.10) folder, so your old Tracker installation is unaffected. Any old files that you choose to import into Tracker 3.10 are copied from their original locations, leaving the originals untouched.

The procedure for installing Tracker is the same as that for other Vicon products.

To install Tracker:

1. Download and extract the appropriate installation file from the [Vicon web site](#)<sup>4</sup>.
2. Double-click the installation file.  
Before proceeding with installation, Tracker 3 automatically scans for Tracker 2.x files, displays a list of any older files that it finds, and provides an automated system for importing these into Tracker 3. This process copies all the old files and converts the copies, ensuring that original files are not moved, altered, or destroyed.
3. Follow the instructions on each wizard page, completing the required details.  
The Tracker 3.10 installer enables optional installation of the License Server software for server-based licensing, and the dongle drivers for licenses that are locked to dongles.

For information on the licensing utility (Vicon Product Licensing), see License Vicon Tracker in Installing and licensing Vicon Tracker.

If you are prompted to restart your PC, do so as soon as possible.

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<sup>4</sup> <https://www.vicon.com/software/tracker/>

## About Vicon Tracker

\ About Vicon Tracker licensing \

## About Vicon Tracker licensing

Vicon Tracker 3.10 uses Safenet licensing and a built-in licensing utility (Vicon Product Licensing).

You specify the license server via a dialog box that appears if no license is found or via the **Help > Vicon Product Licensing** menu option. The server name is stored in the following file under Windows 10:

*<InstallationDrive>* :

\Users\Public\Documents\Vicon\Licensing\TrackerLicInfo#.xml

If you need to view information about licensing while you are using Tracker, on the **Help** menu, click **Vicon Product Licensing**.

For detailed instructions on how to use Vicon Product Licensing, see License Vicon Tracker in Installing and licensing Vicon Tracker.



## New features and functions

# New features and functions

The following topics provide a summary of the new features of Vicon Tracker 3, beginning with the most recent changes.

- [Tracker 3.10 new features and functions on page 10](#)
- [Tracker 3.9 new features and functions on page 19](#)
- [Tracker 3.8 new features and functions on page 21](#)
- [Tracker 3.7 new features and functions on page 24](#)
- [Tracker 3.6 new features and functions on page 29](#)
- [Tracker 3.5 new features and functions on page 35](#)
- [Tracker 3.4 new features and functions on page 37](#)
  - [Recalibrate marker positions on page 38](#)
  - [Work with grouped objects on page 39](#)
- [Tracker 3.3 new features and functions on page 43](#)
  - [Compatibility with Vicon Vero cameras on page 44](#)
  - [Derivatives included in VRPN output on page 53](#)
  - [Quaternion output for CSV export on page 54](#)
- [Tracker 3.2 new features and functions on page 55](#)
- [Tracker 3.1 new features and functions on page 63](#)
- [Tracker 3.0 new features and functions on page 75](#)

## New features and functions

\ Tracker 3.10 new features and functions \

## Tracker 3.10 new features and functions

These new features have been added to Tracker 3.10:

- [Compatibility with Vicon Valkyrie on page 10](#)
- [Support for Tobii Pro Glasses 3 on page 18](#)

### Compatibility with Vicon Valkyrie

The latest version of Tracker is compatible with Vicon's new Vicon Valkyrie cameras, enabling you to benefit from their speed, resolution and power.

Tracker 3.10 is compatible with the following Valkyrie camera models:

- Valkyrie VK26, with a resolution of up to 26.2 megapixels (5120 x 5120) and full frame rate capture speed of 150 fps
- Valkyrie VK16, with a resolution of up to 16.1 megapixels (5120 x 3152) and full frame rate capture speed of 240 fps



## New features and functions

### \ Tracker 3.10 new features and functions \

Vicon Valkyrie cameras are fitted with:

- A unique, new varifocal lens developed by Vicon to give unparalleled range and precision.
- IP65-rated protection, which ensures they are suitable for use in challenging environments
- Three status LEDs, which give clearly visible camera status information. For more information, see [Valkyrie status LEDs and TFT LCD display on page 12](#).
- An accelerometer, which enables you to select a camera in the volume by tapping it, and which monitors the camera position to alert you if any cameras are accidentally knocked or moved from their intended positions. For more information, see [Valkyrie Tap to Select feature on page 14](#) and [Valkyrie Bump detection and display on page 15](#).
- Thermal sensors, which monitor camera temperature levels so that you are warned of any changes in temperature that could affect the system status. For more information, see [Valkyrie temperature sensor display on page 17](#).

To connect Valkyrie cameras to the host PC, Vicon offers a range of options, depending on the number of cameras you want to use and whether you are adding them to an existing Vicon system. To determine the most appropriate topology for your system, see the Valkyrie system diagrams and contact your local Vicon Sales representative.

For synchronization to third-party devices and timecode, together with connections for analog devices, you can add a Vicon Lock Lab to your Valkyrie system.



#### Important

Vicon Valkyrie cameras can be used in the same system as Vicon Vantage, Vero, Viper and Bonita cameras, but if you add Valkyrie cameras to a system that includes T-Series cameras, the T-Series cameras will not work.

Also note that using T-Series cameras with Tracker 3.10 is not supported or tested. Use of T-Series cameras with Tracker 3.10 and later is at your own risk. For information on using these cameras, see the documentation for versions of Tracker earlier than 3.10.

In addition to working with the latest version of Vicon Tracker, Vicon Valkyrie cameras can also be used with the Vicon Control app.

## New features and functions

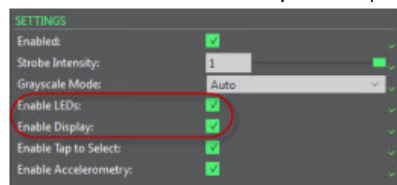
\ Tracker 3.10 new features and functions \

**Caution:** To maintain IP65 protection for your Vicon Valkyrie cameras, ensure that if you remove IP65 cable caps (and/or lens covers), you replace them correctly, as described in Remove and replace IP65 cable cap and Set camera focus and aperture, steps 2 and 9) in the *Vicon Valkyrie Quick Start Guide*.

For information on setting up Vicon Valkyrie systems, see the Vicon Valkyrie documentation.

## Valkyrie status LEDs and TFT LCD display

- Location: Camera's **Properties** pane > **Settings** section



To help you monitor the status of Vicon Valkyrie cameras, the cameras include status LEDs and a TFT LCD (thin film transistor liquid crystal display):

- Three LEDs provide feedback on camera operation, one pair on either side of the camera, and one below the display.
- The display on the front of the Vicon Valkyrie camera, combined with the status LEDs' color, gives information about the current camera status.

Under normal conditions (unless a connected application changes the display, and unless the display has been disabled in Tracker), the display changes to reflect the camera status.



## New features and functions

### \ Tracker 3.10 new features and functions \

To change the display of Vicon Valkyrie camera status information:

1. In the **System Resources** list, select a camera (or all cameras).
2. In the **Settings** section of the **Properties** pane, select or clear **Enable LEDs** and/or **Enable Display**.

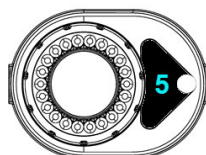
With **Enable LEDs** and **Enable Display** selected, while the camera is booting, the display shows the Valkyrie logo and the status LED color changes from gold to blue when it connects to Tracker.

The display changes to reflect the camera's status, giving information about camera status, for example when the camera has finished booting, whether it is currently active, and its calibration status.



When **Enable Display** is cleared, the display is blank.

When **Enable Accelerometry** is selected (see [Valkyrie bump detection and display on page 68](#)), the image on the display rotates based on the orientation of the camera.



After the camera has booted, you can check the cameras' status by observing the status LEDs and the display on each camera. You can also monitor the camera status in Tracker.

## New features and functions

\ Tracker 3.10 new features and functions \

### Valkyrie Tap to Select feature

- Location: Camera's Properties pane > Settings section



Vicon Valkyrie cameras provide a Tap to Select feature, which enables you to lightly tap the camera in the volume to select it (and deselect the other cameras). Enable Tap to Select is on by default.

To turn Tap to Select off or on:

1. In the **System Resources** list, select the required camera.
2. In the **Properties** pane, go to the **Settings** section and clear or select **Enable Tap to Select**.

Note that when **Enable Accelerometry** is selected, if you tap a calibrated camera too hard, the camera may be reported as 'bumped' (that is, its Bumped status may be selected in the Status section and it may be displayed with a 'caution' icon in the System Resources list).

You can remove the camera's bumped status in Tracker. If this is a frequent occurrence, you can change its sensitivity to being tapped by reducing the **Bump Detection Sensitivity**.

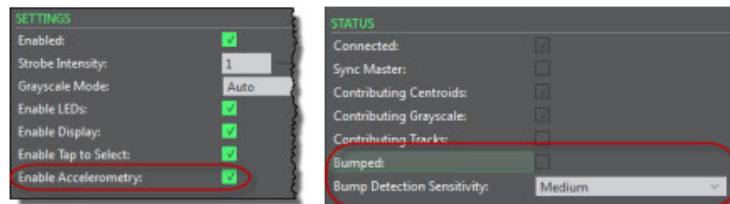
For information on removing a camera's bumped status and changing **Bump Detection Sensitivity**, see [Valkyrie bump detection and display](#) on page 68.

## New features and functions

\ Tracker 3.10 new features and functions \

### Valkyrie bump detection and display

- Location: Camera's Properties pane > Settings section and Camera's Properties pane > Status section



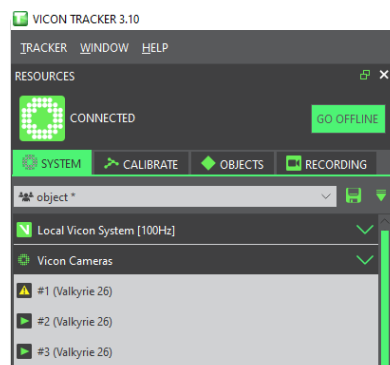
In addition to the Tap to Select feature (see [above on page 67](#)), Vicon Valkyrie cameras also provide bump detection.

When **Enable Accelerometry** is selected, (its default state) bump detection works on calibrated cameras to alert you when they have moved from their calibrated positions. (This setting also turns on or off the auto-rotation of the display on Valkyrie cameras.)

To turn bump detection off or on:

1. In the **System Resources** pane, select a camera (or all cameras).
2. In the **Properties** pane, expand the **Settings** section and clear or select **Enable Accelerometry**.

When **Enable Accelerometry** is selected, if a calibrated camera is accidentally knocked, the camera's **Bumped** check box (in its **Status** properties) displays a check mark. Its icon also changes in the System Resources list.



## New features and functions

### \ Tracker 3.10 new features and functions \

To change the sensitivity of the accelerometer:

1. In the **System Resources** list, select the required camera.
2. In the **Properties** pane, go to the **Status** section and select a different option in the **Bump Detection Sensitivity** menu.

To clear a camera's Bumped status:

For a single camera:

1. In the **System Resources** list, select the bumped camera.
2. In the **Status** section of the **Properties** pane, clear the **Bumped** check box.

For all cameras:

- Press Ctrl+Shift+B

Note the following limitations:

- Bump detection is active only on calibrated cameras.
- Bump detection cannot detect movement that does not change the local gravity vector, for example. slow translation with no rotation; rotation about the G-vector.
- Bump detection cannot detect movements that occur when the camera is not connected to a live system.
- The camera is detected as bumped when the reading from the accelerometer is sufficiently different from the last reading that was sent. Therefore gradual changes (for example, a slipping camera mount) may not be detected until they are large enough to trigger a new notification.



## New features and functions

\ Tracker 3.10 new features and functions \

### Valkyrie temperature sensor display

- Location: Camera's Properties pane > Hardware section > Strobe Temp , Camera Body Temp 1 and Camera Body Temp 2

HARDWARE	
Type:	Valkyrie 26
Strobe Type:	IR
Camera Body Temp.:	40
Camera Sensor Temp.:	40
Sensor Width:	5120
Sensor Height:	5120

Significant changes in camera temperature can have small effects on the camera's lens. Camera calibrations take into account lens intrinsics. Changes in these intrinsic properties can have small impacts on overall data quality. However, note that large temperature changes generally result in only very small data effects. Temperature monitoring is made available to optimize calibration-to-collection consistency.

Vicon Valkyrie cameras have on-board temperature sensors. These onboard temperature sensors enable you to determine when cameras have reached a stable temperature from a cold start and to observe any change in camera temperature (possibly associated with environmental changes).

The data for the onboard sensors is displayed in the **Hardware** section. A numeric indicator (in degrees Celsius) and a colored temperature indicator is displayed for each of the sensors. The color of the indicator changes to reflect a change in temperature: yellow (warming up to the temperature specified by the lower bounds), green (between the specified upper and lower bounds) or red (overheated above the upper bounds).

#### Note

In addition to the above warnings, when a camera's temperature sensors detect that the interior of the camera has reached the following values, Tracker warns you of your camera's status:

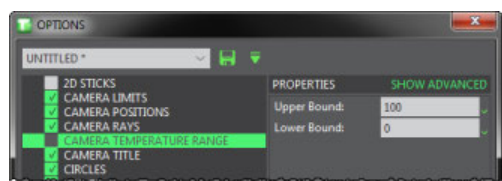
- Hot Case: 65.00°C
- Critical: 75.00°C
- Shutdown: 80.00°C

## New features and functions

### \ Tracker 3.10 new features and functions \

Because Vicon motion capture cameras are used in a wide variety of environments, a stable camera temperature will be different for different users. The **Camera Temperature Range** option enables you to set values that are representative of your laboratory environment.

You can change the upper and lower bounds of the temperature range in the **Options** dialog box (F7).



## Support for Tobii Pro Glasses 3

You can now connect Tobii Pro Glasses 3 in Tracker via WiFi or Ethernet.

For information about setting up and using Tobii Pro Glasses 3 with Tracker, see Use Tobii Eye Tracker with Vicon Tracker in the *Vicon Tracker User Guide*.

## New features and functions

\ Tracker 3.9 new features and functions \

## Tracker 3.9 new features and functions

The following new feature has been added to Tracker 3.9:

- [Compatibility with Vicon Vantage+ cameras on page 19](#)

### Compatibility with Vicon Vantage+ cameras

Tracker 3.9 supports the use of the Vantage+ firmware upgrade, enabling you to use **High Speed** mode on your Vantage cameras without having to change the field of view (FOV) or lens. When you capture optical data, subsampling (selectively reducing the pixel count) enables you to run at high camera frame rates without reducing the FOV (frame size).

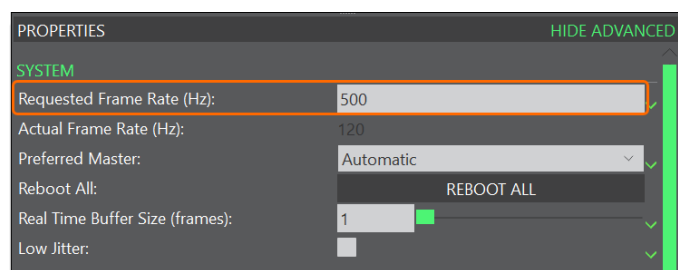
Previously, to run Vantage cameras at higher frame rates while maintaining their maximum resolution, windowing was used, which reduces the size of the FOV.

Now, in new **High Speed** mode, you can run your Vantage cameras at higher frames rates while maintaining the FOV. You can change frame rates during capture and you do not need to set up your cameras again when you increase the frame rate, as the FOV is unchanged.

Note that because the higher speeds are achieved through subsampling (removing some pixels from the frames), some reduction in resolution is incurred. For details, see High-speed mode in the *Vicon Vantage Reference Guide*.

To select high-speed mode:

1. With Tracker in Live mode, set the system frame rate to the speed you want to use in High Speed mode.

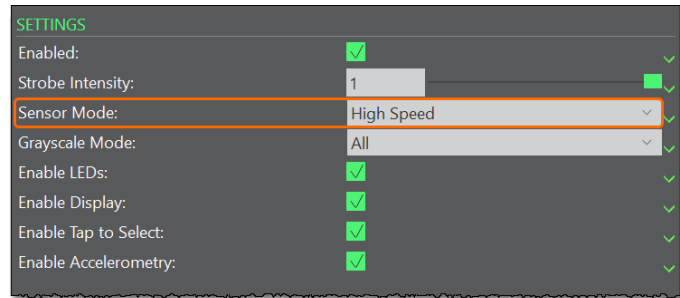



A warning may temporarily be displayed, alerting you to the discrepancy between the requested frame rate and the actual system frame rate, until you select high speed mode for all the relevant cameras, as explained next.

## New features and functions

\ Tracker 3.9 new features and functions \

2. On the **System** tab, select one or more cameras.
3. In the **Properties** pane, go to the **Settings** section, click the **Sensor Mode** menu and select **High Speed**.



In the **Camera** view pane, notice that the High Speed mode icon  is displayed in the bottom left corner of the view.

4. With **Allow Windowing** selected (the default), windowing (reducing the size of the field of view) is used above the following frame rates:
  - V16: 500 fps
  - V8: 900 fps
  - V5: 1060 fps

If you don't want to use windowing in addition to High Speed mode, ensure the Advanced properties are displayed and clear the **Allow Windowing** check box.



After a few moments, the system runs at the new speed.

## New features and functions

\ Tracker 3.8 new features and functions \

## Tracker 3.8 new features and functions

New features including the following were added to Vicon Tracker 3.8:

- [Ability to use Viper cameras with Tracker on page 22](#)
- [Tobii Eye Tracker integration on page 22](#)
- [Apply a manually calculated scaling factor for precise volume scaling on page 23](#)
- [Automation with the Python API on page 23](#)
- [Open Sound Control integration on page 23](#)

## New features and functions

\ Tracker 3.8 new features and functions \

### Ability to use Viper cameras with Tracker

You can now use strobeless Viper and ViperX cameras as part of your Vicon Tracker system, enabling you to benefit from using active markers in your volume. Active markers are particularly useful in large volumes where they provide a significant visibility improvement, especially in adverse conditions.

### Tobii Eye Tracker integration

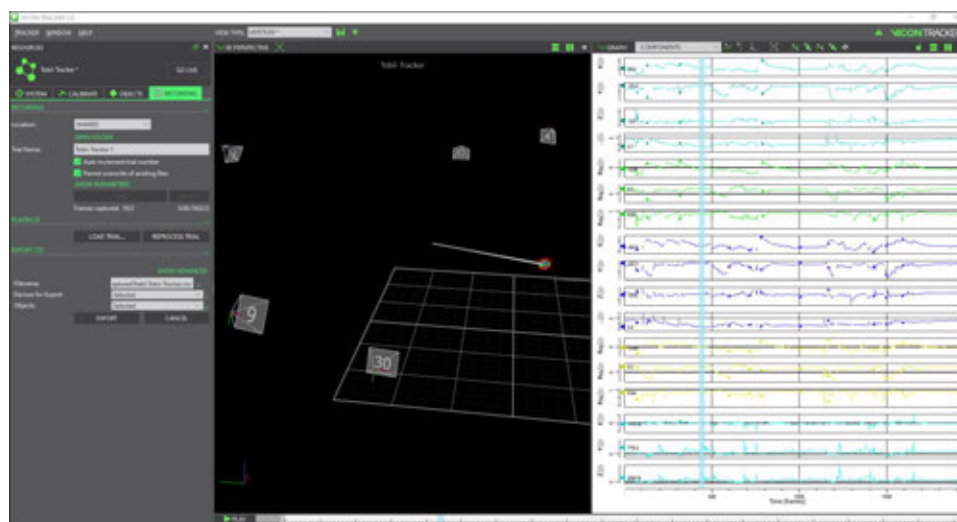
Location: System Resources tab > Devices > Add Digital Device > Add Tobii Pro Glasses 2

Tracker 3.8 lets you directly integrate a Tobii Eye Tracker in your Vicon system, so that you can output eye tracker position and gaze direction, with binocular gaze tracking.



#### Restrictions:

- Tobii integration currently only supports the Tobii Pro Glasses 2.
- Supports only one pair of glasses at a time.



For information about setting up and using Tobii Pro Glasses 2 with Tracker, see Use Tobii Eye Tracker with Vicon Tracker in the *Vicon Tracker User Guide*.

## New features and functions

\ Tracker 3.8 new features and functions \

### Apply a manually calculated scaling factor for precise volume scaling

Location: Objects tab > right-click object > Use for Camera Calibration > Calibration Scaling dialog box

After you've calibrated the system in the usual way, for maximum real-world accuracy (particularly in large volumes), you can create a large custom calibration object from markers placed across the volume. You can then use this object, coupled with using the Auto Scale option, for subsequent setting of the system origin. This improves calibration stability and consistency over time.

For more information, see Improve volume scaling and set a fixed origin in the *Vicon Tracker User Guide*.

### Automation with the Python API

Tracker includes an Application Programming Interface (API) that enables you to use Python to automate some common functions of Tracker, such as loading, playing and exporting trial or device data, activating or deactivating different objects or triggering parts of the workflow.

For information on how to install and start using the Tracker Python API, see the *Vicon Tracker Python API Quick Start Guide*.

### Open Sound Control integration

Location: System Resources tab > Local Vicon System > Advanced properties > OSC Stream section

Tracker 3.8 enables you to stream data from Tracker over UDP using the Open Sound Control format, so that you can access live data in your OSC server application.

For more information, see OSC Stream section in the *Vicon Tracker User Guide*.

## New features and functions

\ Tracker 3.7 new features and functions \

## Tracker 3.7 new features and functions

New features including the following were added to Vicon Tracker 3.7:

- [Improved calibration volume reproducibility on page 24](#)
- [Automatic notification of firmware updates on page 26](#)

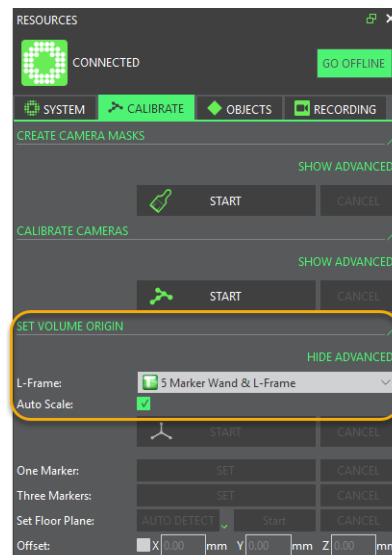
### Improved calibration volume reproducibility

To achieve maximum positional reproducibility of the Vicon coordinate system, you can create a large custom L-Frame object from markers permanently placed around the edge of the capture volume. You can then use this L-Frame object for subsequent setting of the system origin.

This provides a high degree of precision of the coordinate system across the camera calibration.

To help with this, select the new **Auto Scale** option when you set the origin, as described below.

This improves the consistency of the volume size, further improving the positional reproducibility.



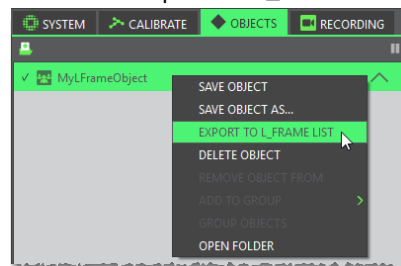


## New features and functions

### \ Tracker 3.7 new features and functions \

To perform a calibration with rescale:

1. Calibrate the system as usual (see Calibrate Vicon cameras).
2. Create an L-Frame object from at least four reconstructed markers (see Creating an object), which spans the whole volume, and set the translation to (0,0,0).  
Note that the L-frame must be constructed from a permanent arrangement of markers that are spread as far apart as possible, without being poorly reconstructed by being too far out of the volume.
3. Pause the system.
4. Select the L-Frame object you just created.
5. In the **Properties** pane, select **Show Advanced**.
6. Set both **Global Position** and **Global Rotation** to (0,0,0).
7. Ensure you have saved the object, then in the **Resources** pane, right-click it and select **Export to L\_Frame list**.



8. Calibrate the system and during the **Set Volume Origin** step, in the **Set Origin** section, select the L Frame object from the list.
9. Ensure **Show Advanced** is selected and then select **Auto Scale**.  
This ensures that the marker distances in the L Frame are used for volume scaling.
10. Click **Start**.  
The system scale is adjusted to provide improved positional reproducibility.

## New features and functions

\ Tracker 3.7 new features and functions \

### Automatic notification of firmware updates

You are now automatically notified when any component of your Vicon system is running out-of-date firmware, and given the opportunity to update to the latest version.

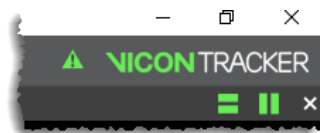


#### Important

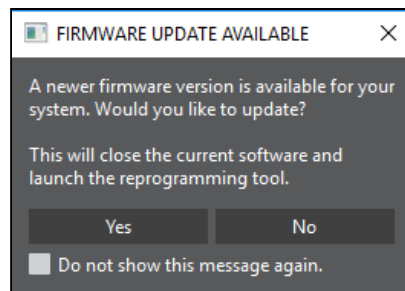
To ensure optimum performance and access to all the latest functionality, Vicon recommends that you upgrade to the latest firmware whenever it becomes available.

To monitor and/or upgrade system firmware:

1. When you start Tracker or connect any Vicon devices into your system, Tracker checks to see whether the firmware for all your devices is up-to-date. If your devices aren't using the latest firmware, Tracker displays an icon in the toolbar to let you know that a more up-to-date version of the firmware is available:



2. Click on the icon to display more information. Tracker displays a prompt that enables you to open the Vicon Firmware Update Utility (reprogramming tool).

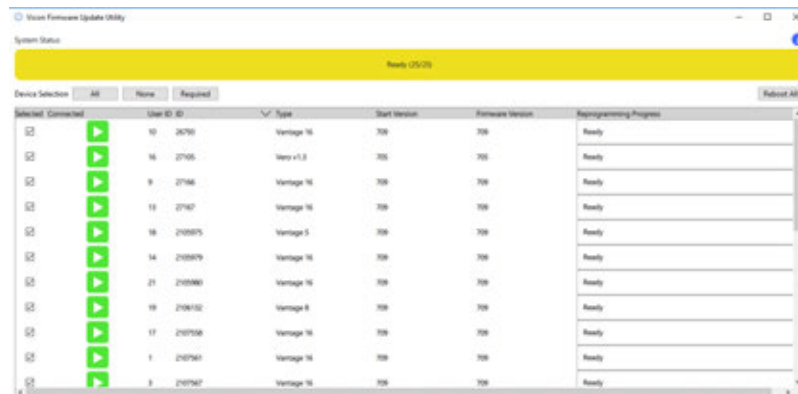


3. Click Yes to open the Vicon Firmware Update Utility. Note that you can also open the Vicon Firmware Update Utility from the **Start** menu (select **Vicon** > **Vicon Firmware Update Utility**).

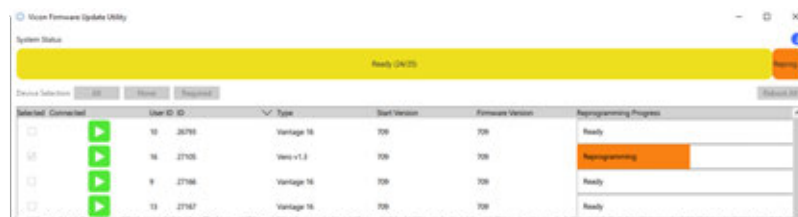
## New features and functions

### \ Tracker 3.7 new features and functions \

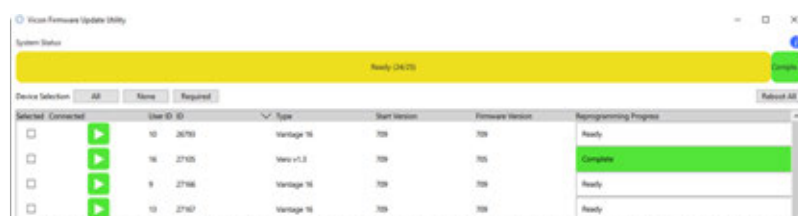
Tracker closes and the Vicon Firmware Update Utility is displayed, showing all the connected devices and their current firmware version.  
By default, all devices are selected.



- If you don't want to update any of the devices, clear the relevant check box(es).  
Note that if required, you can select devices to be updated that are already using the latest version.
- At the bottom of the Vicon Firmware Update Utility window, in the **Choose Firmware version** list, select or browse to the required firmware version.
- Click **Reprogram** to update the firmware for the selected device(s).



When updating is complete, the **Firmware Version** column displays the updated firmware version and the **System Status** line and the **Reprogramming Status** column display **Complete** on a green background.



## New features and functions

\ Tracker 3.7 new features and functions \



### Note

If you do not have continual internet access, Tracker is unable to notify you when a new version of the system firmware is available. In this case, install the Vicon Firmware Update Utility on an internet-connected machine to detect and download the latest version of the firmware. You can then transfer this download to the local machine and use the Vicon Firmware Update Utility to update to the latest version of the firmware.

### To downgrade to an earlier firmware version

To downgrade to a firmware version that was previously downloaded, open the Vicon Firmware Update Utility (from the **Start** menu click **Vicon > Vicon Firmware Update Utility**) and select the required firmware version.

## New features and functions

\ Tracker 3.6 new features and functions \

## Tracker 3.6 new features and functions

New features including the following have been added to Vicon Tracker 3.6:

- [Tracker 3.6.1 new features on page 30](#)
- [Tracker 3.6 new features on page 31](#)

## New features and functions

\ Tracker 3.6 new features and functions \

### Tracker 3.6.1 new features

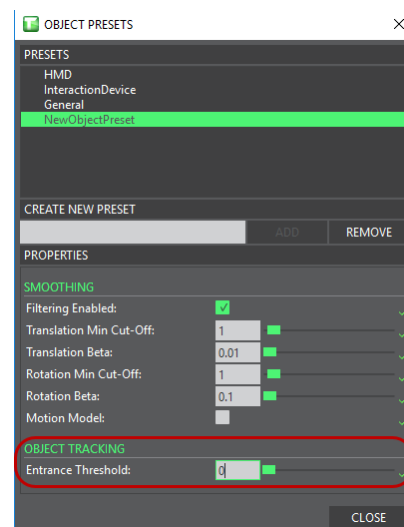
The following enhancements were added to Vicon Tracker 3.6.1:

- [Entrance Threshold can now be per object type on page 30](#)
- [System synchronization from 100 Hz square wave on page 31](#)

### Entrance Threshold can now be per object type

Location: Resources pane > Objects tab > Object Type Preset section > Manage Presets > Objects Presets dialog box

You can now define an Entrance Threshold (the minimum proportion of markers that must be visible to the cameras before the object is booted) per object type in the Object Presets dialog box, instead of having to apply it globally for all objects.



To apply an Entrance Threshold to an object:

1. On the Objects tab, in the Object Type Preset section, click Manage Presets.
2. In the Object Presets dialog box, create a new preset and in the Object Tracking section, specify the require Entrance Threshold.
3. On the Objects tab, select the object to which you want to apply the preset.
4. In the Object Type Preset section, select the preset that you created.

## New features and functions

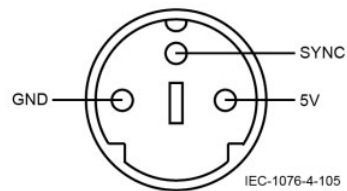
\ Tracker 3.6 new features and functions \

### System synchronization from 100 Hz square wave

The VESA sync input on Vicon Lock devices now supports the connection of a 100 Hz square wave signal for synchronizing the Vicon system to an external clock.

The signal must be 5V peak, with a 50% duty cycle.

The following diagram shows the front view of a VESA sync input, which is a 3-pin mini-DIN socket.



### Tracker 3.6 new features

The following new features were added to Vicon Tracker 3.6:

- [Improvements to tracking on page 31](#)
- [Easier checking for firmware updates on page 32](#)
- [Motion Model filter for selected objects on page 33](#)
- [32-bit version of Tracker on page 34](#)
- [Disable/enable camera strobes on page 34](#)

### Improvements to tracking

Several improvements to tracking include:

- The ability to resolve objects that are close together now enables very small objects to be tracked when they are closer than 10 mm.
- Greater intelligence in the centroid-fitting of data minimizes the impact of large reflections on latency of the system.
- More robust centroid-fitting with objects that are closely similar.

## New features and functions

\ Tracker 3.6 new features and functions \

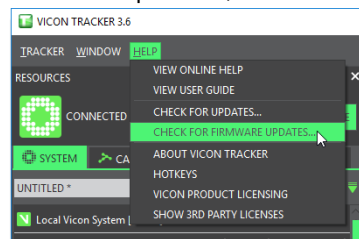
### Easier checking for firmware updates

Location: Help > Check for firmware updates

Tracker provides a quick and easy way to check when new firmware is available for your cameras.

To check the latest release firmware version:

- On the Help menu, click Check for Firmware Updates.



The Checking Firmware Version dialog box displays information about the latest released firmware version.

To check the firmware that your system is using:

- Ensure the system is in Live mode, and in the System Resources pane, right-click Local Vicon System and then click Reprogram Vicon Firmware.  
The firmware version currently used by your system is displayed in the Version column for every connected device.

To download the latest firmware, visit [www.vicon.com/downloads/utilities-and-sdk/camera-firmware](http://www.vicon.com/downloads/utilities-and-sdk/camera-firmware)<sup>5</sup>.

You can then update your firmware using the Reprogram Firmware dialog box.

<sup>5</sup> <http://www.vicon.com/downloads/utilities-and-sdk/camera-firmware>



## New features and functions

\ Tracker 3.6 new features and functions \

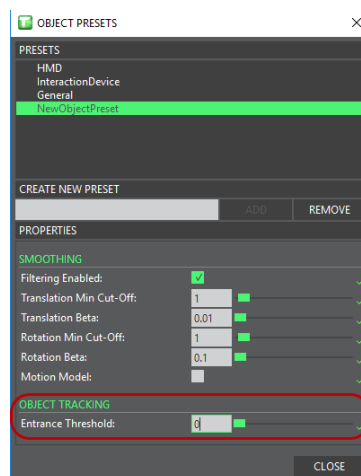
### Motion Model filter for selected objects

Location: Resources pane > Objects tab > Object Type Preset section > Manage Presets > Objects Presets dialog box

You can now apply the Motion Model filter, which enables Tracker to detect static objects, to individual objects.

To enable Tracker to detect an object as stationary:

1. On the Objects tab, in the Object Type Preset section, click Manage Presets.
2. In the Object Presets dialog box, create a new preset and select Motion Model.



3. On the Objects tab, select the object that you want Tracker to detect as stationary.
4. In the Object Type Preset section, select the preset that you created.

## New features and functions

\ Tracker 3.6 new features and functions \

### 32-bit version of Tracker

A version of Tracker 3.6 that runs under 32-bit Microsoft® Windows® is now available.

To obtain the 32-bit version, please contact Vicon Support.



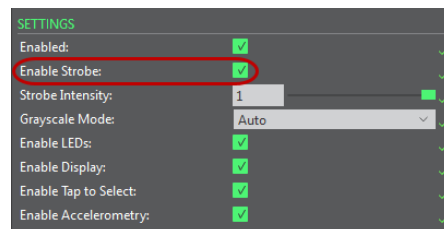
#### Note

Vicon recommends the use of the 64-bit version of Tracker, but the 32-bit version is provided to enable Tracker to be used on older PCs. However, the 32-bit version is provided as-is and with no guarantee of support.

### Disable/enable camera strobes

Location: **System Resources** pane > **Vicon Cameras** node > Vantage or Vero camera(s) selected > **Properties** pane > **Settings** section

A new **Enable Strobe** setting enables you to disable or enable strobes on Vantage or Vero cameras without affecting the shutter period.



## New features and functions

\ Tracker 3.5 new features and functions \

## Tracker 3.5 new features and functions

New features including the following have been added to Vicon Tracker 3.5:

- [New hotkeys option on page 35](#)
- [Display of third-party license information on page 36](#)
- [Lens model improvements on page 36](#)



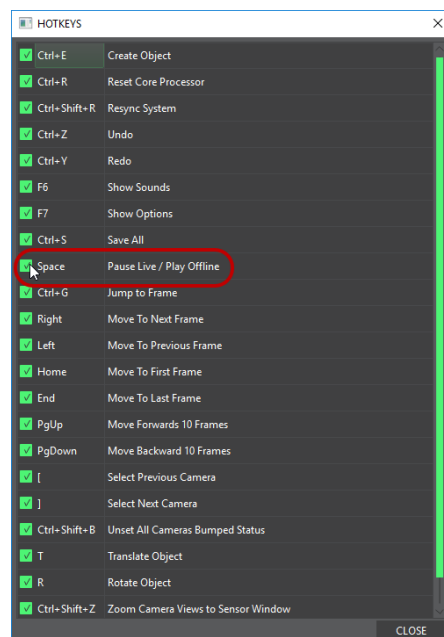
### Note

Calibrations generated with Tracker 3.5 cannot be used in previous versions of the software.

## New hotkeys option

Location: **Help** menu > **Hotkeys**

To prevent accidental loss of tracking, you can now choose whether to use the spacebar to pause the system. To access this option along with other hotkeys, on the **Help** menu, click **Hotkeys**.



In the **Hotkeys** dialog box, select or clear the options as required.

## New features and functions

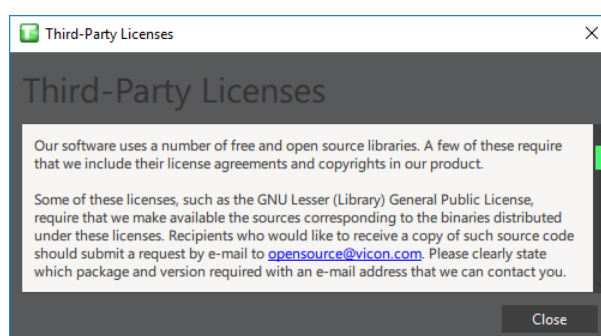
\ Tracker 3.5 new features and functions \

### Display of third-party license information

Location: Help menu > Show 3rd party licenses

To display third party license information, on the **Help** menu, click **Show 3rd party licenses**.

A dialog box, similar to the following, is displayed. Scroll down to see license information for all relevant third-party software:



### Lens model improvements

The lens model in Tracker has been extended to work more robustly with lenses that have a high degree of distortion.

## New features and functions

\ Tracker 3.4 new features and functions \

## Tracker 3.4 new features and functions

New features including the following have been added to Vicon Tracker 3.4:

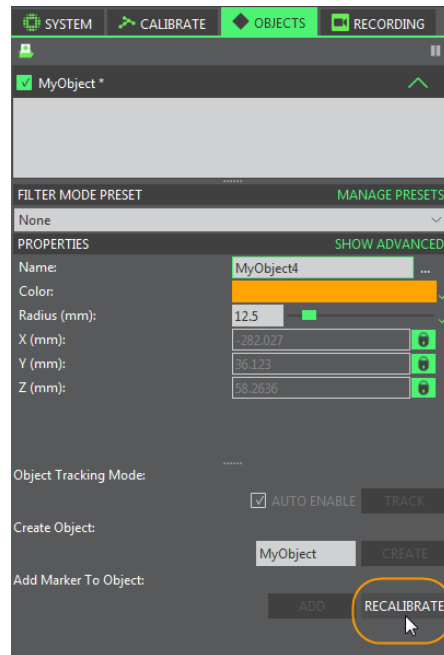
- [Recalibrate marker positions on page 38](#)
- [Work with grouped objects on page 39](#)

## New features and functions

\ Tracker 3.4 new features and functions \

### Recalibrate marker positions

Location: Resources pane > Objects tab > Add Marker to Object area



If a calibrated object becomes distorted due to a marker having been lost and replaced in a slightly different position from its original location, you can use the **Recalibrate** button to update the marker position.

The **Recalibrate** button enables you to recalibrate the object at the current pose, updating the marker position without affecting the pose of the object.

#### To recalibrate a marker:

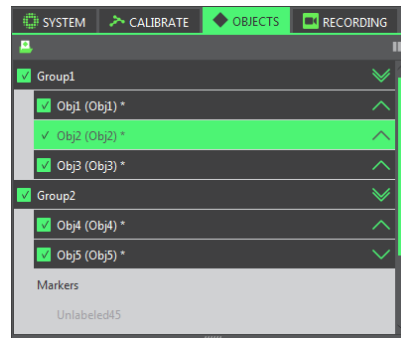
1. Select the marker that has been replaced, or whose position has moved slightly.
2. On the **Objects** tab, click the **Recalibrate** button.  
The marker position is updated, but the object's orientation and the other markers are unaffected.

## New features and functions

\ Tracker 3.4 new features and functions \

### Work with grouped objects

Location: Resources pane > Objects tab



The ability to act on multiple objects simultaneously is useful when you are working with similar objects, such as the collection of rigid bodies that make up a single subject.

You can group objects and then select the group, so that activation, selection, and deletion applies to all objects in the selected group.

For more information, see:

- [Create a group on page 40](#)
- [Add objects to a group on page 40](#)
- [Activate and deactivate grouped objects on page 41](#)
- [Select grouped objects on page 41](#)
- [Ungroup or delete grouped objects on page 41](#)
- [Change the color of grouped objects on page 42](#)
- [Save grouped objects on page 42](#)

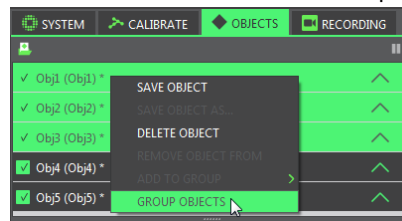
## New features and functions

\ Tracker 3.4 new features and functions \

### Create a group

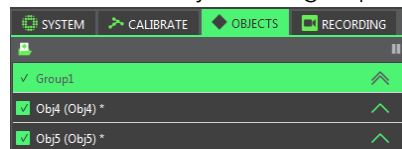
To create a group of objects:

1. On the **Objects** tab, click to select the required objects, then right-click and on the context menu click **Group Objects**.



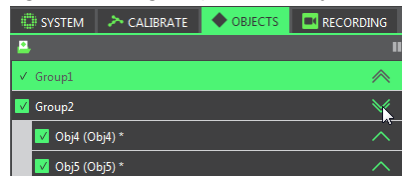
2. Enter a name for your group and click OK.

The selected objects are grouped under the new group name:



You can create further groups of objects as required.

3. To see the objects in a group, expand the group by clicking the arrow to the right of the group name. By default, all objects in the group are activated:



### Add objects to a group

To add objects to an existing group:

On the **Objects** tab, right-click the name of the object that you want to add to the group, point to **Add to Group**, and then click the name of the required group.



## New features and functions

\ Tracker 3.4 new features and functions \

### Activate and deactivate grouped objects

To activate/deactivate objects

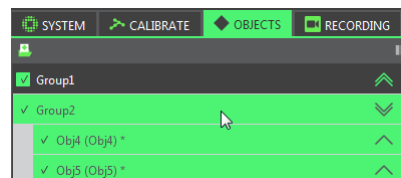
On the **Objects** tab, you can activate/deactivate grouped objects in either of these ways:

- **All objects in a group:** Clear or select the check box to the left of the group name.
- **One or more objects within a group:** Expand the group and clear or select the check box to the left of the object name.  
The check box to the left of the group name changes to reflect the activation status of objects within the group.

### Select grouped objects

To select grouped objects

When you select a group (that is, click its name on the **Objects** tab), all the objects in the group are selected by default:



You can also click, SHIFT-click and CTRL-click to select/deselect one or more objects within the group.

### Ungroup or delete grouped objects

To ungroup or delete objects

On the **Objects** tab, you can ungroup and/or delete grouped objects in either of these ways:

- **All objects in a group:** Right-click the group name and click the required option:
  - **Delete** permanently deletes the group and all the objects within it.
  - **Ungroup** moves all the group's objects outside the group and lists them separately on the **Objects** tab. The group name is no longer displayed.

## New features and functions

\ Tracker 3.4 new features and functions \

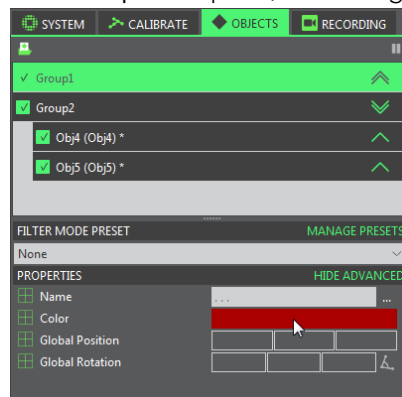
or

- One or more objects within a group: Expand the group, right-click the required object(s) and then click the required option:
- Delete Object permanently deletes the object.
- Remove Object from *GroupName* moves the object from within the group to outside the group, so that it is listed separately on the Objects tab.

## Change the color of grouped objects

To change the color of grouped objects

1. On the Objects tab, select a group by clicking its name.
2. In the Properties pane, click the group's Color box.



3. In the Select Color dialog box, choose the required color.  
The color of all the objects in the selected group changes.

## Save grouped objects

To save grouped objects:

On the Objects tab, expand the group, right-click the object and click **Save Object**.

## New features and functions

\ Tracker 3.3 new features and functions \

## Tracker 3.3 new features and functions

New features including the following have been added to Vicon Tracker 3.3:

- [Compatibility with Vicon Vero cameras on page 44](#)
- [Derivatives included in VRPN output on page 53](#)
- [Quaternion output for CSV export on page 54](#)

## New features and functions

\ Tracker 3.3 new features and functions \

### Compatibility with Vicon Vero cameras

The latest version of Tracker is compatible with Vicon's new Vicon Vero and Vicon Vue cameras, enabling you to benefit from their speed, flexibility and affordability.

Vicon Vero includes two optical camera models: 2.2, which can provide up to 330 fps with 2.2 megapixel resolution; and 1.3, which offers up to 250 fps with 1.3 megapixel resolution.



## New features and functions

### \ Tracker 3.3 new features and functions \

Vicon Vero cameras are fitted with:

- Side-mounted status LEDs on both the camera and the strobe, which give clearly visible camera status information. For more information, see [Vero camera status LEDs on page 46](#).
- An accelerometer, which enables you to select a camera in the volume by tapping it, and which monitors the camera position to alert you if any cameras are accidentally knocked or moved from their intended positions. For more information, see [Vero Tap to Select feature on page 48](#) and [Vero Bump detection and display on page 49](#).
- Thermal sensors, which monitor camera temperature levels so that you are warned of any changes in temperature that could affect the system status. For more information, see [Vero temperature sensor display on page 51](#).

To connect Vero cameras to the host PC, Vicon offers a range of options, depending on the number of cameras you want to use and whether you are adding them to an existing Vicon system. To determine the most appropriate switch for your system, contact your local Vicon Sales representative.

For synchronization to third-party devices and timecode, together with connections for analog devices, you can add a Vicon Lock+ or Vicon Lock Lab to your Vero system.

Vicon Vero cameras can be used in the same system as Vicon T-Series, Bonita and Vantage cameras, but note that they cannot be connected to a Giganet.

In addition to working with current Vicon Tracker, Vicon Vero cameras can also be used with the Vicon Control app.

For instructions on setting up Vicon Vero systems, see the PDF *Vicon Vero Quick Start Guide*, which you can [download from the Vicon website](#)<sup>6</sup>.

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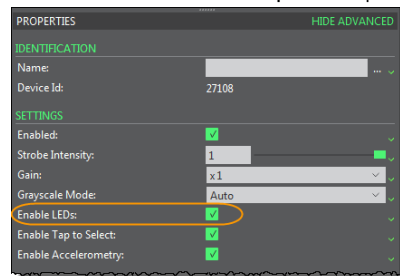
<sup>6</sup> <https://docs.vicon.com>

## New features and functions

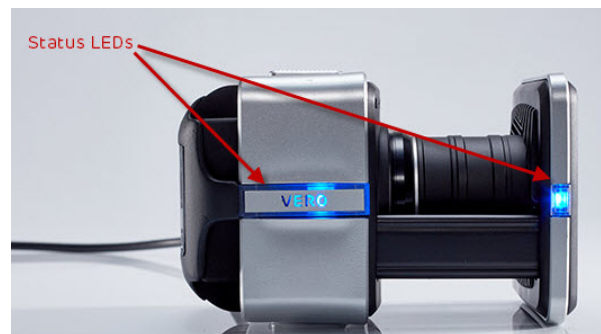
\ Tracker 3.3 new features and functions \

### Vero camera status LEDs

- Location: Camera's Properties pane > Settings section



To help you monitor the status of the cameras, they are fitted with status LEDs. Two pairs of tri-color LEDs provide feedback on camera operation, one pair on either side of the camera, and the second pair on either side of the strobe.



To change the display of camera status information:

1. In the **System Resources** list, select a camera (or all cameras).
2. In the **Settings** section of the **Properties** pane, select or clear **Enable LEDs**.  
With **Enable LEDs** selected, while the camera is booting, the status LED color changes from yellow during booting, to red when booting is complete.  
When the cameras are communicating with Tracker, the status LEDs turn blue.

## New features and functions

### \ Tracker 3.3 new features and functions \

After the camera has booted, you can check the cameras' status by observing the status LEDs on each camera, in addition to monitoring the camera status in Tracker.

Color	Status
Blue	Enabled (default)
Red	Not contributing
Red (flashing)	Bumped
Off	Disabled
Magenta	Selected
Off	Calibration (Wand count == 0)
Magenta (flashing, period decreases with wand count)	Calibration (0 < Wand count < Required wands)
Green	Calibration (Wand count >= Required wands)
Cyan	Automasking
Off	Status LEDs disabled



#### Note

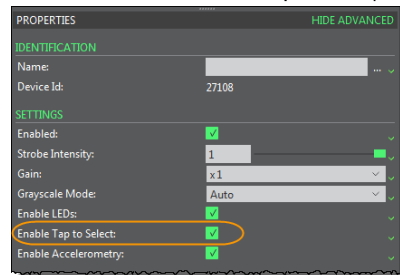
In certain camera modes and in certain system configurations, the status LEDs on the camera are automatically turned off to ensure maximum power is available to the strobe.

## New features and functions

\ Tracker 3.3 new features and functions \

### Vero Tap to Select camera feature

- Location: Camera's **Properties** pane > **Settings** section



Vicon Vero cameras provide a Tap to Select feature, which enables you to lightly tap the camera in the volume to select it (and deselect the other cameras). This is useful, for example, when you are setting up cameras, before they are calibrated. The Tap to Select feature is on by default.

To turn Tap to Select on or off:

1. In the **System Resources** list, select the required camera.
2. In the **Properties** pane, go to the **Settings** section and select or clear **Enable Tap to Select**.

Note that when **Enable Accelerometry** is selected, if you tap a camera too hard, or if the camera is accidentally knocked, a calibrated camera is reported as 'bumped', that is, the camera's status LEDs flash red and in Tracker, the **Status** section in the **Properties** pane for the relevant camera displays a check mark in its **Bumped** check box.

You can remove a camera's **Bumped** status in Tracker. If this is a frequent occurrence, you can change its sensitivity to being tapped by reducing the **Bump Detection Sensitivity**. For more information, see the following section.

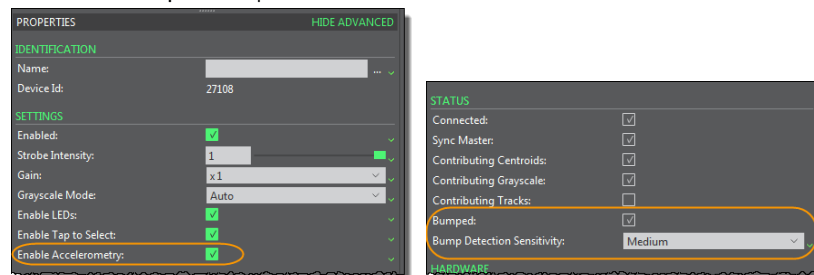


## New features and functions

\ Tracker 3.3 new features and functions \

### Vero bump detection and display

- Location: Camera's Properties pane > Settings section and Camera's Properties pane > Status section



When Enable Accelerometry is selected (its default status), bump detection works on calibrated cameras to alert you when they have moved from their calibrated positions.

## New features and functions

### \ Tracker 3.3 new features and functions \

To turn bump detection on or off:

1. In the **System Resources** pane, select a camera (or all cameras).
2. In the **Properties** pane, expand the **Settings** section and select or clear **Enable Accelerometry**.

When **Enable Accelerometry** is selected, if a calibrated camera is accidentally knocked, the camera's status LEDs indicate that it is a bumped camera by flashing red and in Tracker, the camera's **Bumped** check box (in its **Status** properties) displays a check mark.

To change the sensitivity of the accelerometer:

1. In the **System Resources** list, select the required camera (or all cameras).
2. In the **Properties** pane, go to the **Status** section and in the **Bump Detection Sensitivity** pull-down, select a different option.

To clear a camera's Bumped status:

For a single camera:

1. In the **System Resources** list, select the bumped camera.
2. In the **Properties** pane, go to the **Status** section and clear the **Bumped** check box.

For all cameras:

Press Ctrl+Shift+B

Note the following limitations:

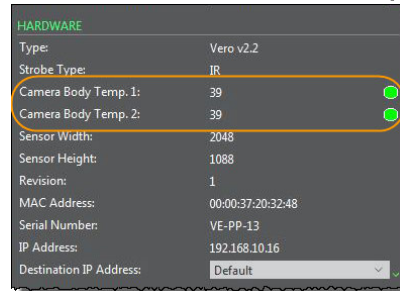
- Bump detection is active only on calibrated cameras.
- Bump detection cannot detect movement that does not change the local gravity vector, for example. slow translation with no rotation; rotation about the G-vector.
- Bump detection cannot detect movements that occur when the camera is not connected to a live system.
- The camera is detected as bumped when the reading from the accelerometer is sufficiently different from the last reading. Therefore gradual changes (for example, a slipping camera mount) may not be detected until they are large enough to trigger a new notification.

## New features and functions

\ Tracker 3.3 new features and functions \

### Vero temperature sensor display

- Location: Camera's Properties pane > Hardware section > Camera Body Temp 1 and **Camera Body Temp 2**



Significant changes in camera temperature can have small effects on the camera's lens. Camera calibrations take into account lens intrinsics. Changes in these intrinsic properties can have small impacts on overall data quality.

However, note that large temperature changes generally result in only very small data effects. Temperature monitoring is made available to optimize calibration-to-collection consistency.

Vicon Vero cameras have on-board temperature sensors. These sensors enable you to determine when cameras have reached a stable temperature from a cold start and to observe any change in camera temperature (possibly associated with environmental changes).

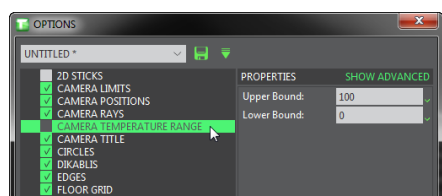
The data for the onboard sensors is displayed in the **Hardware** section. A numeric indicator (in degrees Celsius) and a colored temperature indicator is displayed for each sensor. The color of the indicator changes to reflect a change in temperature: yellow (warming up to the temperature specified by the lower bounds), green (between the specified upper and lower bounds) or red (overheated above the upper bounds).

Because Vicon motion capture cameras are used in a wide variety of environments, a stable camera temperature will be different for different users. The **Camera Temperature Range** option enables you to set values that are representative of your working environment.

## New features and functions

\ Tracker 3.3 new features and functions \

You can change the upper and lower bounds of the Camera Temperature Range in the Options dialog box (F7).



## New features and functions

\ Tracker 3.3 new features and functions \

### Derivatives included in VRPN output

Derivatives of pose data are now automatically supplied as part of VRPN output.

For greater reliability and robustness, VRPN clients that are able to make use of velocity and acceleration data can use this information directly from Tracker's VRPN output, rather than having to calculate this on the client side.

This is useful, if, for example, you want to use Vicon data within a dead reckoning algorithm, or other prediction algorithm, to estimate pose at a time that may or may not coincide with a Vicon frame.

## New features and functions

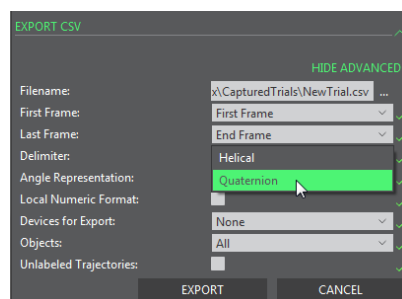
\ Tracker 3.3 new features and functions \

### Quaternion output for CSV export

Tracker 3.3 offers an additional Quaternion option for CSV export.

To use quaternion angle representation:

1. Prepare your data for CSV export as described in [CSV Export on page 56](#).
2. Click the Angle Representation list and select Quaternion.



When you export the file, angles are exported as quaternions instead of Helical angles.

## New features and functions

\ Tracker 3.2 new features and functions \

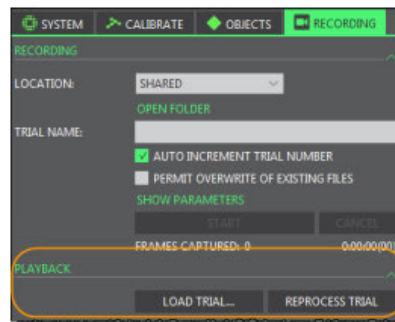
## Tracker 3.2 new features and functions

New features including the following have been added to Vicon Tracker 3.2:

- [Offline processing on page 55](#)
- [CSV export on page 56](#)
- [New sensor windowing display on page 58](#)
- [Improved floor plane calibration on page 60](#)
- [Track mode now auto enabled on page 61](#)
- [Instant auditory feedback on page 61](#)

### Offline processing

- Location: **Resources pane > Recording tab > Playback section**



In Vicon Tracker 3.2, the playback of offline data has been completely reworked to provide better performance and closer simulation of realtime tracking. You will find this feature useful for simulating a live system, for example, if you are developing and/or configuring your own software that requires Tracker data as input. You can also use this feature to perform offline analysis of Tracker data with your own software tools.

If you change the filtering of the offline data, click the **Reprocess Trial** button to recalculate your saved data.

## New features and functions

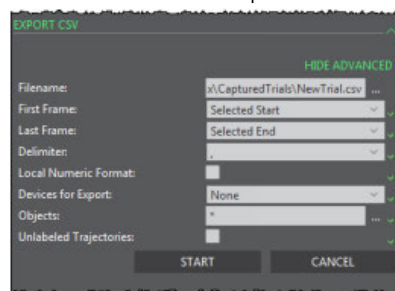
### \ Tracker 3.2 new features and functions \

To use offline processing:

1. On the **Recording** tab, in the **Recording** section, ensure that the relevant **Location** setting is selected (**Shared** or **Private**), depending on the option chosen for the trial you want to load.
2. In the **Playback** area, click **Load Trial** to locate the last saved trial. If you want to load a different trial, browse to the appropriate location. Click **Open**.  
The recorded trial is loaded, a time bar appears beneath the view pane and Tracker automatically enters **Offline** mode (if this was not already selected).
3. If required, on the time bar select the range that is of interest.
4. On the time bar, click the **Play** button. To stop or pause the replay, click **Stop** or press the space bar on the keyboard. To view a particular part of the trial, drag the slider along the time bar, or to move through the trial, press the forward or back arrow keys.  
A progress bar is displayed while the file is processed.  
Objects are tracked and data is output from Tracker as if it were coming from a live system.
5. To export the data to your chosen format, in the **Export CSV** section, select the required options and click **Start**. For more information, see [CSV export on page 56](#).

## CSV export

- Location: **Resources pane > Recording tab > Export CSV section**



The new CSV (comma-separated values) export feature enables you to export saved trial data to a plain text file, saved in CSV format.



## New features and functions

### \ Tracker 3.2 new features and functions \

To export processed Tracker data to a CSV file:

1. Ensure you have loaded and processed the required data, as described in [Offline processing on page 55](#).
2. On the **Recording** tab, expand **Export CSV**, display the **Advanced** parameters and change their settings as required:
  - **Filename** Do one of the following:
    - Accept the default **Current Trial** setting; or
    - To use a different path and/or filename, click the ellipsis (...). You can then browse to another location and/or enter the required file name, including its extension, for example my\_trial.csv.
  - **First Frame** and **Last Frame** If required, change these to specify the range that you want to export.
  - **Delimiter** Do one of the following:
    - Click to choose the delimiter of the exported data, selecting either commas, tabs, or line feeds/carriage returns; or
    - To use a different delimiter, click the downward arrow and clear the **Macro** check box. You can then edit the **Delimiter** field to specify a combination of ASCII characters (maximum of two characters).
  - **Local Numeric Format** If you want the exported data to use the local language float number format, select this check box.
  - **Devices for Export** Do one of the following:
    - Click to choose to export either no objects (None, the default option), only the selected objects, or all objects; or
    - To select from a list of available devices, click the downward arrow, and clear the Macro check box.
  - **Objects:** Do one of the following (active objects only):
    - Click to choose to export either all objects (All, the default option), only the selected objects, or none.
    - To use the wildcard \* to specify all objects, click the downward arrow and clear the Macro check box. You can also edit the **Objects** field to provide a list of objects (use the object names that appear in the System tree), separated with commas.

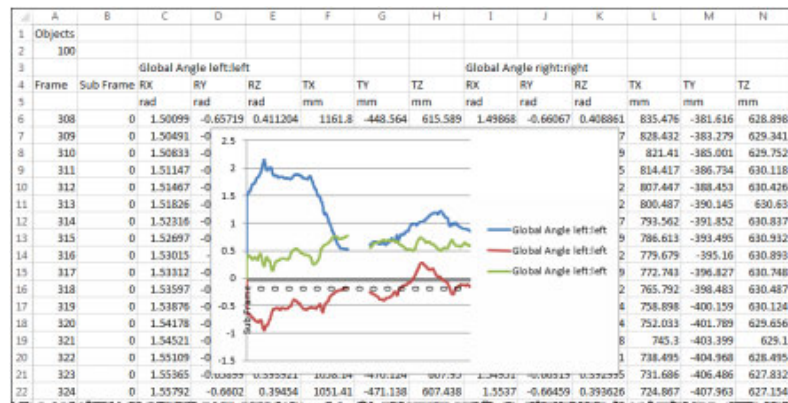
## New features and functions

### \ Tracker 3.2 new features and functions \

- **Unlabeled Trajectories:** If selected, unlabeled marker trajectories are exported.

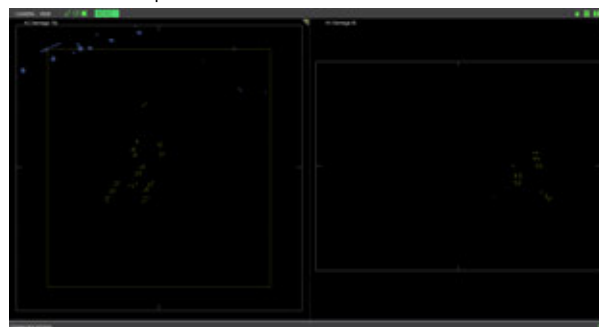
3. To begin the export, click **Start**.

You can examine the exported data in your spreadsheet program.



## New sensor windowing display

- Location: Options dialog box (F7) > Camera Limits option > Sensor Window property; or
- Location: Camera view > Display camera sensor window buttonThe windowed area is indicated by a rectangle within the Camera view, showing the size and position of the active window on the camera sensor.



The windowing display is visible in the Camera view, in the 3D Overlay view and in Rotated view.

Using Tracker 3.2 with Vicon Vantage or MX T-Series cameras, you can now view the windowing that occurs at higher frame rates.

## New features and functions

### \ Tracker 3.2 new features and functions \

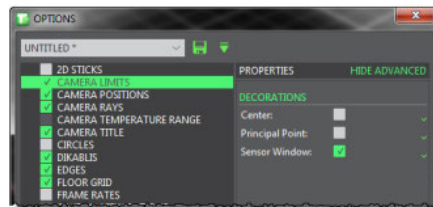
To toggle the display of windowing:

- On the Camera view toolbar, click the Display camera sensor window button.



or

- In the Options dialog box (F7), click the Camera Limits option and in the Properties pane, select the Sensor Window property

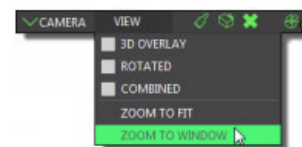


You can gain instant feedback on the area that is captured and save room on the screen by zooming in to the sensor window.

Note: For captures made in versions of Tracker before 3.2, zooming in to the sensor window applies to Live mode only.

To zoom in to the displayed sensor window:

1. Ensure sensor windowing is displayed (see above).
2. In a Camera view, from the View menu, select Zoom to Window.



To turn on Zoom to window for all windows:

- Press the hot keys: Ctrl+Shift+Z.

## New features and functions

\ Tracker 3.2 new features and functions \

### Improved floor plane calibration

To ensure that your coordinate system is accurately aligned with the floor of the capture volume, you can now adjust the position of the floor plane, using markers in the volume to automatically define it.

To calibrate the floor plane:

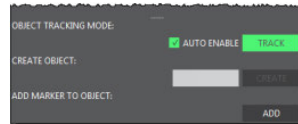
1. Scatter a quantity of the same size Vicon markers across the floor of your capture volume. If you want Tracker to automatically recognize these markers as floor plane markers, ensure that they outnumber any other groups of markers (e.g, markers on a wand or markers that were used to focus cameras, etc).
2. Complete the usual system calibration procedure to set the volume origin.
3. On the **Calibrate** tab, expand **Set Volume Origin** and display the **Advanced** properties.
4. Next to **Set Floor Plane**, ensure that the options are as required:
  - **Auto detect:** Markers are automatically detected, based on the marker group that defines the plane with the most markers. If, when you click **Start**, the wrong markers are selected in the **3D Perspective** view, you can add or remove markers in the volume until selection is as required. To ensure that the tolerance setting (in mm), which specifies the height of the group of markers that define the floor plane, is as required, click the drop-down arrow next to **Auto Detect**.
  - **Offset:** Set the amount (in mm) by which to adjust the floor plane (default is zero) in X Y and Z planes. The offset is applied after you have set the origin using the **Set Floor Plane** setting.
5. Click the **Start** button in the **Set Floor Plane** line.  
The button toggles to its **Stop** setting.
6. After a few seconds, click the **Stop** button.  
In the **3D Perspective** view the cameras shift as a group slightly along one or more rotation axes to better reflect an average of the markers scattered across the floor.  
Your Vicon cameras are now calibrated and ready to capture data.

## New features and functions

\ Tracker 3.2 new features and functions \

### Track mode now auto enabled

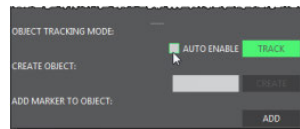
- Location: Resources pane > Objects tab > Object Tracking Mode section



Track mode was introduced in Tracker 3.0 (see [New Track mode minimizes output latency on page 84](#)). To save you from having to turn Track mode on and off, it is now on by default when objects are activated or created (including when Tracker is started if active objects are present).

It is off by default when no active objects are present.

If this behavior is undesirable (for example, if you are creating multiple objects), you can toggle tracking off or on by clearing or selecting **Auto Enable**.



### Instant auditory feedback

- Location: Windows menu > Sounds option (or press F6) > Enabled option

Tracker 3.2 provides you with the option to play sounds through your PC's speakers to alert you when a Tracker event has taken place (for example, operation completion, system status, and issues). This keeps you informed of system status while you're still in the volume, so that you don't have to spend time returning to the PC to look at the screen.

When sounds are enabled, by default Tracker uses speech sounds to alert you to the following events:

- Calibration start
- Wand Wave complete
- Calibration complete
- Calibration failed
- Origin set

## New features and functions

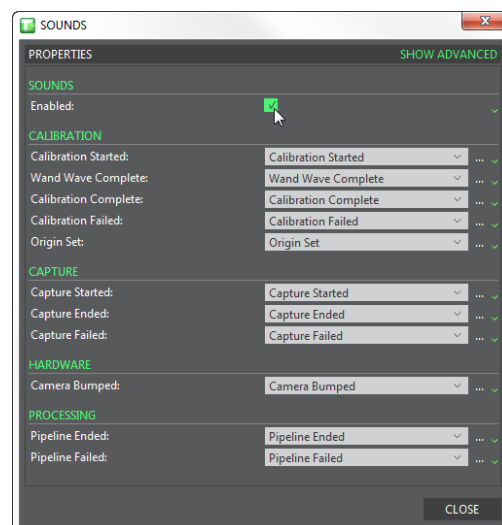
### \ Tracker 3.2 new features and functions \

- Capture started
- Capture ended
- Capture failed
- Camera bumped
- Pipeline ended
- Pipeline failed

Tracker is supplied with a set of default sound files (.wavs). You can modify the sounds that are used for each event and you can enable all sounds or enable sounds individually.

To enable sounds and change these settings:

1. Press F6; or  
On the **Windows** menu, click **Sounds**.
2. In the **Sounds** dialog box, select **Enabled**.



To choose one of the other sounds supplied with Tracker, click the drop-down arrow and select the required sound from the list.

To substitute your own sounds for those supplied with Tracker, click the relevant ellipsis (...) and enter or browse to the location of the required .wav files.

To disable one or more sounds, click the relevant drop-down arrow and select (None) from the list.

To disable all sounds, in the **Sounds** section, clear the **Enabled** check box.

## New features and functions

\ Tracker 3.1 new features and functions \

## Tracker 3.1 new features and functions

New features including the following were added to Vicon Tracker 3.1:

- [Compatibility with Vicon Vantage systems on page 63](#)
- [Compatibility with Vicon Lock+ on page 71](#)
- [Compatibility with Vicon Control on page 71](#)

### Compatibility with Vicon Vantage systems

The latest version of Tracker is compatible with the Vicon Vantage range of cameras and hardware, enabling you to benefit from the power and usability of the new system.

Vicon Vantage includes three camera models, beginning with the V5, which offers up to 420 fps with 5 megapixel resolution, the V8 at up to 270 fps with 8 megapixel resolution and the V16, which can provide up to 120 fps with 16 megapixel resolution.



## New features and functions

### \ Tracker 3.1 new features and functions \

In addition, all three models offer:

- A front-facing OLED display as well as side-mounted status lights, which give clearly visible camera ID information and system feedback. For more information, see [New camera status LEDs and OLED display on page 65](#).
- An accelerometer, which enables you to select a camera in the volume simply by tapping it, and which monitors the camera position to alert you if any cameras are accidentally knocked or moved from their intended positions. For more information, see [New Tap to Select feature on page 67](#) and [New bump detection and display on page 68](#).
- Thermal sensors, which monitor camera temperature levels so that you are warned of any changes in temperature that could affect the system status. For more information, see [New temperature sensor display on page 70](#).

With a new Vicon-provided PoE+ switch, you can connect up to 12 Vicon Vantage cameras to the Vicon Vantage host PC. The system can be expanded to add more cameras or additional hardware by connecting further PoE+ switches.

For synchronization to third-party devices and timecode, together with connections for analog devices, you can add a Vicon Lock unit (see [Compatibility with Vicon Lock+ on page 71](#)).

For more information on Vicon Vantage systems, see the [Vicon Vantage Quick Start Guide](#) and the [Vicon Vantage Reference](#).

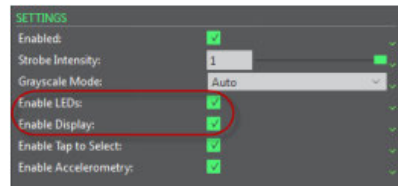


## New features and functions

\ Tracker 3.1 new features and functions \

### New camera status LEDs and OLED display

- Location: Camera's **Properties** pane > **Settings** section



To help you monitor the status of Vicon Vantage cameras, the cameras include status LEDs and an OLED display:

- Two pairs of tri-color LEDs provide feedback on camera operation, one pair on either side of the camera, and the second pair on either side of the strobe.
- The display on the front of the Vicon Vantage strobe, combined with the status LEDs' color, gives information about the current camera status.

Under normal conditions (unless a connected application changes the display, and unless the display has been disabled in Tracker), the display changes to reflect the camera status.



To change the display of Vicon Vantage camera status information:

1. In the **System Resources** list, select a camera (or all cameras).
2. In the **Settings** section of the **Properties** pane, select or clear **Enable LEDs** and/or **Enable Display**.  
 With **Enable LEDs** and **Enable Display** selected, while the camera is booting, the OLED display shows the Vicon logo and the status LED color changes from yellow during booting, to red when booting is complete.  
 When the cameras are communicating with Tracker, the status LEDs turn blue.

The display changes to reflect the camera's status, giving information about camera status, for example when the camera has finished booting, its calibration status, and whether it has been moved since calibration.

## New features and functions

\ Tracker 3.1 new features and functions \



When Enable Display is cleared, the display is blank.



When Enable Accelerometry is selected (see [New bump detection and display on page 68](#)), the image on the display rotates based on the orientation of the camera.



After the camera has booted, you can check the cameras' status by observing the status LEDs and the OLED display on each camera. You can also monitor the camera status in Tracker.

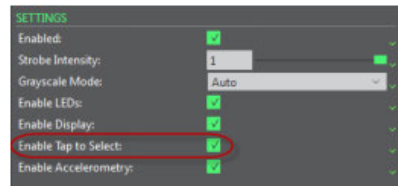
For more information about the status LEDs, see the [Vicon Vantage Reference](#).

## New features and functions

\ Tracker 3.1 new features and functions \

### New Tap to Select feature

- Location: Camera's Properties pane > Settings section



Vicon Vantage cameras provide a Tap to Select feature, which enables you to lightly tap the camera in the volume to select it (and deselect the other cameras). **Enable Tap to Select** is on by default.

To turn Tap to Select off or on:

1. In the **System Resources** list, select the required camera.
2. In the **Properties** pane, go to the **Settings** section and clear or select **Enable Tap to Select**.

Note that when **Enable Accelerometry** is selected, if you tap a calibrated camera too hard, the camera is reported as 'bumped' (that is, its status LEDs and OLED display (if enabled) indicate that it is a bumped camera).

You can remove the camera's bumped status in Tracker. If this is a frequent occurrence, you can change its sensitivity to being tapped by reducing the **Bump Detection Sensitivity**.

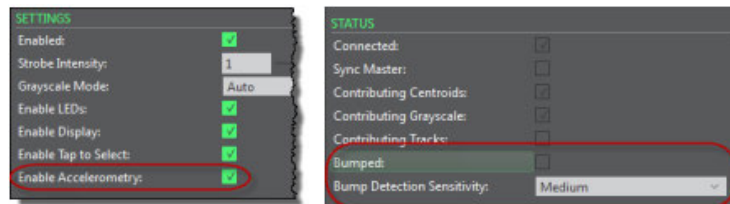
For information on removing a camera's bumped status and changing **Bump Detection Sensitivity**, see [New bump detection and display on page 68](#).

## New features and functions

\ Tracker 3.1 new features and functions \

### New bump detection and display

- Location: Camera's Properties pane > Settings section and Camera's Properties pane > Status section



In addition to the Tap to Select feature (see [above on page 67](#)), Vicon Vantage cameras also provide bump detection.

When **Enable Accelerometry** is selected, (its default state) bump detection works on calibrated cameras to alert you when they have moved from their calibrated positions. (This setting also turns on or off the auto-rotation of the display on Vantage cameras.)

To turn bump detection off or on:

1. In the **System Resources** pane, select a camera (or all cameras).
2. In the **Properties** pane, expand the **Settings** section and clear or select **Enable Accelerometry**.

When **Enable Accelerometry** is selected, if a calibrated camera is accidentally knocked, its display changes.



In Tracker, the camera's **Bumped** check box (in its **Status** properties) displays a check mark.

## New features and functions

### \ Tracker 3.1 new features and functions \

To change the sensitivity of the accelerometer:

1. In the **System Resources** list, select the required camera.
2. In the **Properties** pane, go to the **Status** section and select a different option in the **Bump Detection Sensitivity** pull-down.

To clear a camera's Bumped status:

For a single camera:

1. In the **System Resources** list, select the bumped camera.
2. In the **Status** section of the **Properties** pane, clear the **Bumped** check box.

For all cameras:

- Press Ctrl+Shift+B

Note the following limitations:

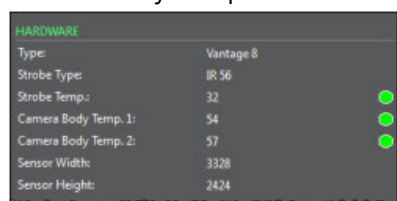
- Bump detection is active only on calibrated cameras.
- Bump detection cannot detect movement that does not change the local gravity vector, for example. slow translation with no rotation; rotation about the G-vector.
- Bump detection cannot detect movements that occur when the camera is not connected to a live system.
- The camera is detected as bumped when the reading from the accelerometer is sufficiently different from the last reading that was sent. Therefore gradual changes (for example, a slipping camera mount) may not be detected until they are large enough to trigger a new notification.

## New features and functions

\ Tracker 3.1 new features and functions \

### New temperature sensor display

- Location: Camera's Properties pane > Hardware section > Strobe Temp, Camera Body Temp 1 and Camera Body Temp 2



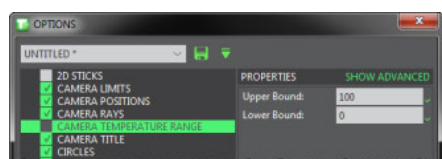
Significant changes in camera temperature can have small effects on the camera's lens. Camera calibrations take into account lens intrinsics. Changes in these intrinsic properties can have small impacts on overall data quality. However, note that large temperature changes generally result in only very small data effects. Temperature monitoring is made available to optimize calibration-to-collection consistency.

Vicon Vantage cameras have on-board temperature sensors. These onboard temperature sensors enable you to determine when cameras have reached a stable temperature from a cold start and to observe any change in camera temperature (possibly associated with environmental changes).

The data for the onboard sensors is displayed in the **Hardware** section. A numeric indicator (in degrees Celsius) and a colored temperature indicator is displayed for each of the sensors. The color of the indicator changes to reflect a change in temperature: yellow (warming up to the temperature specified by the lower bounds), green (between the specified upper and lower bounds) or red (overheated above the upper bounds).

Because Vicon motion capture cameras are used in a wide variety of environments, a stable camera temperature will be different for different users. The **Camera Temperature Range** option enables you to set values that are representative of your laboratory environment.

You can change the upper and lower bounds of the temperature range in the **Options** dialog box (F7).



## New features and functions

\ Tracker 3.1 new features and functions \

### Compatibility with Vicon Lock+

Tracker 3.1 is compatible with Vicon Lock+, a new Vicon connectivity device that facilitates the integration of synchronous third-party equipment with Vicon Vantage and Vicon Bonita cameras by providing or receiving synchronization and/or timecode.



It also provides connectivity for third-party analog capture sources, such as force plates, EMG equipment, and generic devices.



#### Important

The use of Vicon Lock+ is supported for Vicon Vantage and Vicon Bonita camera systems only.

When a Lock+ is connected into a compatible Vicon system, it appears in the **System Resources** list in the same way as other Vicon connectivity devices.

To access its properties and settings, in the **System Resources** list, click the name of the Lock+ device.

You can then access its controls in the **System Resources** list.

For information on connecting a Vicon Lock+ into a Vicon camera system, see the **Vicon Lock+ Quick Start Guide** and the relevant specification sheet.

### Compatibility with Vicon Control

With the latest version of Tracker, you can use the Vicon Control app, currently available on iOS 8 devices, to set up, calibrate, and capture with a Vicon Vantage, T-Series or Bonita system.

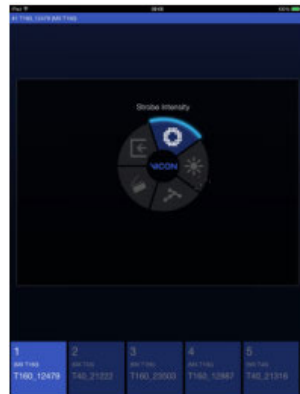
Control connects wirelessly to Vicon Tracker and streams camera data to your mobile or tablet, enabling a single user to change camera settings, calibrate the system, and start or stop capture from anywhere in the volume.

Vicon Control features include:

## New features and functions

### \ Tracker 3.1 new features and functions \

- The ability to change camera settings, calibrate, and start and stop capture with its intuitive single-handed dial



- View adjustments to the aperture and focus settings by selecting the camera from Control
- Select a Vantage camera and display it automatically using Tap to Select

Note that Vicon Control is compatible with the following devices:

- Phone 5, 5C, 5S, 6, 6+
- iPad Air, iPad Air 2, iPad Mini 2, and iPad 3



## New features and functions

\ Tracker 3.1 new features and functions \

### Connect Vicon Control

Before you can use your iOS device with Tracker, you must pair it with the PC that is running Tracker (the Vicon host PC).

To connect an iOS device running the Vicon Control app to Tracker on a Vicon host PC:

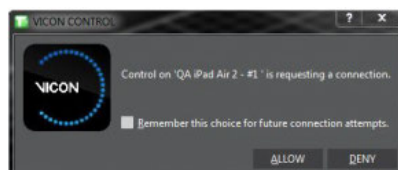
1. Ensure that your iOS device is connected to a Wifi access point that is on the same subnet as the Vicon host PC.
2. On the Vicon host PC, ensure that the required connection is used, that Tracker is running, and the system is connected.



3. On the device, open the Vicon Control app.  
The connection to Tracker is displayed on the initial Control screen:



4. Tap the Tracker icon.  
You are alerted that you must authorize the connection on the Vicon host PC before you can continue.  
In Tracker on the Vicon host PC, an authorization request is displayed:



5. To use the same connection in future, select Remember this choice for future connection attempts. To let Control access Tracker, click Allow.

## New features and functions

### \ Tracker 3.1 new features and functions \



#### Tip

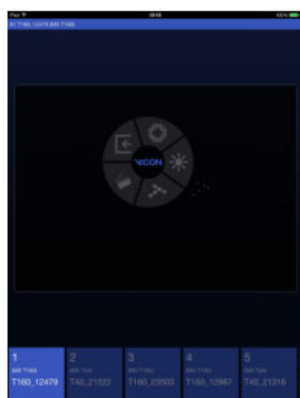
If later you need to revoke authorizations for Vicon Control, on the **Window** menu in Tracker, click **Reset Control Authorization**. This revokes all stored authorizations.

On the iOS device, a screen similar to the following is displayed:



6. To select a camera and display a camera view, tap the bottom of the screen. Swipe the camera view right or left to change to the next or previous camera. Use stretch and pinch to zoom in and out.

To access the dial control, tap and hold in a selected camera view.



Use the dial to view and change settings, calibrate and capture.

## New features and functions

\ Tracker 3.0 new features and functions \

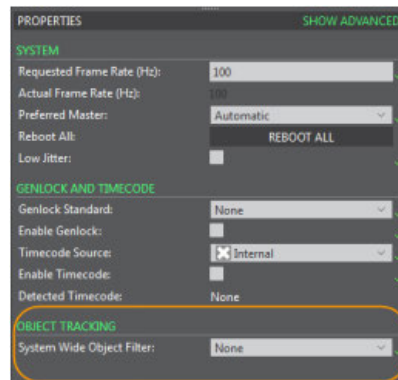
## Tracker 3.0 new features and functions

New features including the following were added to Vicon Tracker 3.0:

- [Filtering and smoothing on page 75](#)
- [Choose different smoothing options for each object on page 76](#)
- [Jitter reduction on page 78](#)
- [Improved processing on page 79](#)
- [Access Tracker data from Simulink on page 79](#)
- [Other enhancements in Vicon Tracker 3.0 on page 80](#)

### Filtering and smoothing

- Location: Resources pane > System tab > Local Vicon System > Properties pane > Object Tracking section



Vicon Tracker 3.0 offers new filtering options to detect static objects and minimize jitter caused by marker occlusion.

In the Properties pane for Local Vicon System, the new Object Tracking section contains the System-wide Object Filter dropdown list.

## New features and functions

### \ Tracker 3.0 new features and functions \

To apply a filter to all objects, choose one of the options:

- **None:** No filtering of any objects, unless object-specific filtering is applied: see [Choose different smoothing options for each object on page 76](#).
- **Motion Model:** Enables Tracker to detect static objects. When selected, Tracker outputs a constant position and orientation for an object from the time it is detected as not moving to the time it resumes motion. Use this option to clamp the position of an unmoving object to its previous known position.
- **Bias Tracking:** Applies a smoothing filter that tracks systematic errors in the camera measurements to minimize motion jitter when markers become occluded in the camera views.

## Choose different smoothing options for each object

- Location: **Resources pane > Objects tab > Filter Mode Preset section**

Vicon Tracker 3.0 enables you to apply a One Euro low-pass smoothing filter to a selected object. Where you have multiple objects, you can apply different filtration settings to each object, enabling you to tailor the amount of filtration to the motion of the specific object.

To assist you in setting appropriate filtration for your objects, Tracker 3.0 provides the following commonly used filter mode presets:



- **None:** Apply no object-specific filtering to the selected object.
- **HMD:** Apply settings normally appropriate for head-mounted devices.
- **InteractionDevice:** Apply settings normally appropriate for Vicon Apex devices.
- **General:** Use as a general-purpose filtration type.

## New features and functions

### \ Tracker 3.0 new features and functions \

If none of the supplied filter mode presets is suitable for your application, you can also create and save your own custom filter mode presets, so that you can quickly and accurately apply them to other objects, as required.

#### To apply filtering to a selected object:

1. In the **Objects** tree at the top of the **Objects** tab, ensure that the object to which you want to apply the filter is selected.
2. Depending on whether you want to use an existing filtration type or create your own, do one of the following:
  - If you want to use one of the existing filter types, in the **Filter Mode Preset** section, select the required filter from the dropdown list and save the object as described in step 5.
  - or
  - If the required filtration type does not exist, in the **Filter Mode Preset** section, click **Manage Presets** and in the **Filter Presets** dialog box, enter a name in the **Create New Preset** box and then click **Add**.
3. In the **Filter Presets** section, ensure the new preset is selected, then in the **Smoothing** section, change the **Translation** and **Rotation** properties as required:
  - a. With **Translation Beta** set to zero, change the value of **Translation Min Cut-Off** to eliminate jitter during very slow movements.  
Note that decreasing the value of **Translation Min Cut-Off** reduces jitter but increases lag.
  - b. When you have finished adjusting the **Translation Min Cut-Off** value, increase the value of **Translation Beta** by very small increments to eliminate lag during faster movement.  
Note that 0 = filtering on all translation motion; 1 = filtering on very slow translation motion only.
  - c. Follow the same procedure for adjusting the **Rotation Min Cut-Off** and **Rotation Beta**.  
For detailed information on the One Euro filter and how to adjust these settings, visit [www.lifl.fr/~casiez/1euro/](http://www.lifl.fr/~casiez/1euro/)<sup>7</sup>.
  - d. When you have finished adjusting the properties, click **Close**.
4. On the **Objects** tab, make sure that in the **Filter Mode Preset** section, the required filter is displayed for the selected object.

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<sup>7</sup> <http://www.lifl.fr/~casiez/1euro/>

## New features and functions

\ Tracker 3.0 new features and functions \



### Tip

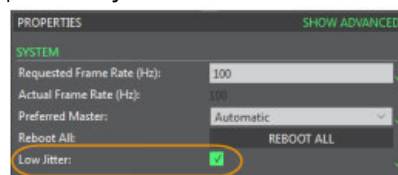
To apply a filter to an Apex device, select the device and in the **General** section of the **Properties** pane, from the **Filtering Type** list, select the required filtering type.

5. Save the object by right-clicking it the **Objects** list and selecting **Save Object** from the context menu.

Tracker saves the contents of the object in a .vsk file in the **Objects** folder.

## Jitter reduction

- Location: **Resources** pane > **System** tab > **Local Vicon System** > **Properties** pane > **System** section > **Low Jitter** option



To enable you to minimize jitter in marker positions while tracking objects, a new **Low Jitter** option is now available in **System** properties.

This option sets the **Grayscale Mode** for all cameras to **Only** (this is necessary to enable jitter reduction to work), and applies Tracker's jitter reduction algorithms to the current data. This reduces noise in the data by using advanced centroid fitting and other jitter reduction measures.



### Caution

Low jitter mode is more sensitive to bandwidth limitations than previous versions of tracking and its effectiveness is related to system size. For further information on the impact of using low jitter mode with your system, contact [Vicon Support](#)<sup>8</sup>.

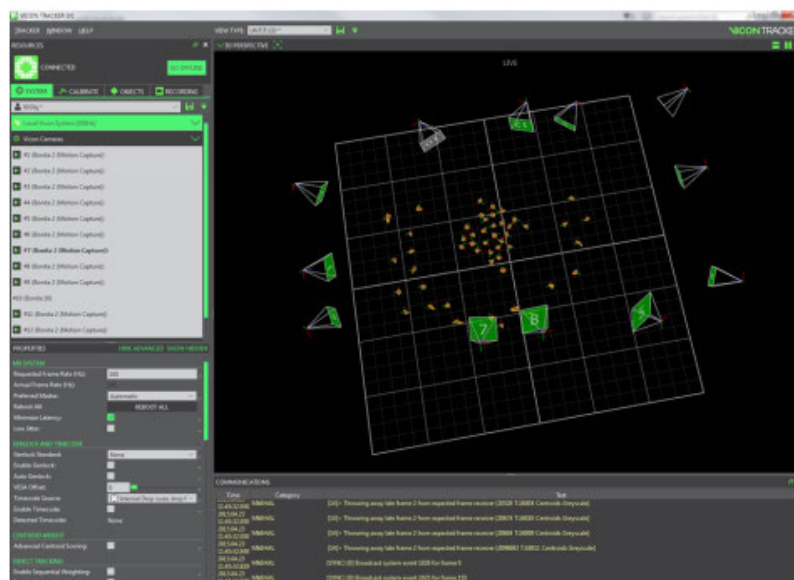
8 <mailto:support@vicon.com>

## New features and functions

\ Tracker 3.0 new features and functions \

### Improved processing

Vicon Tracker 3.0 has been re-engineered to significantly reduce processing latency and improve processing frame rate, even with high numbers of tracking objects and cameras, by making full use of modern multiple-core CPUs.



Improvements in processing rate mean that end-to-end latency may also be reduced by increasing the Vicon camera frame rate.

### Access Tracker data from Simulink

See Accessing Vicon Tracker data from Simulink, in the Vicon Tracker User Guide.

## New features and functions

\ Tracker 3.0 new features and functions \

## Other enhancements in Vicon Tracker 3.0

Further enhancements and updates including the following have been made in Tracker 3.0:

- [Calibration error displayed in millimeters on page 80](#)
- [Easier setup of Apex devices on page 81](#)
- [New hotkey/Tracker shortcut on page 82](#)
- [Auto-naming of new objects on page 82](#)
- [Additional VRPN output on page 82](#)
- [Easier upgrading on page 83](#)
- [Improved analysis and troubleshooting for captured data on page 83](#)
- [New Track mode minimizes output latency on page 84](#)
- [Set Camera view background to Threshold value on page 84](#)
- [Automatic selection of cameras and view for masking and calibration on page 85](#)
- [Change in Shared data locations on page 86](#)
- [Change in default Minimum Cameras to Start Trajectory on page 86](#)

## Calibration error displayed in millimeters

- Location: **Resources pane > Calibration tab > Camera Calibration Feedback section > World Error column**

CAMERA	WAND COUNT	WORLD ERROR	IMAGE ERROR
#1 (MX T160)	2569	0.154046	0.179132
#2 (MX T160)	2118	0.19691	0.194675
#3 (MX T160)	3353	0.164636	0.16925
#4 (MX T40...	2205	0.254085	0.128648
#5 (MX T160)	3922	0.137991	0.115596
#6 (MX T160)	2663	0.1741	0.158016
#7 (MX T160)	2593	0.156798	0.143857
#8 (MX T160)	4157	0.201622	0.16482
#9 (MX T160)	3077	0.148689	0.108592
#10 (MX T4...	1819	0.175485	0.116204

In Tracker 3.0, the **World Error** column in the **Camera Calibration Feedback** section displays the calibration error in millimeters, giving you a sense of how



## New features and functions

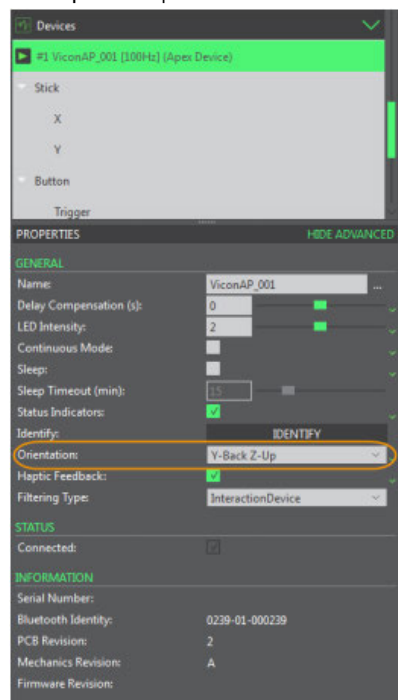
### \ Tracker 3.0 new features and functions \

much the errors in the camera contribute to the reconstruction of object pose error.

World error is calculated per camera from the **Image Error** in pixels and the distance of the camera to the center of the volume. Cameras further away display a higher **World Error** than cameras closer to the center of the volume with the same image error.

## Easier setup of Apex devices

- Location: **Resources pane > System tab > Devices node > Apex device node > Properties pane > General section**



In the **Properties** pane for the selected device, the **General** section enables you to select from the following orientation options for the device coordinate system:

To facilitate the setting up of Apex devices within a virtual environment, Vicon Tracker incorporates options for the device axes.

- Y-Back Z-Up
- Y-Forward Z-Up
- X-Back Z-Up
- X-Forward Z-Up

## New features and functions

### \ Tracker 3.0 new features and functions \

This property is saved in the .system file.

The **General** section also contains the new **Filtering Type** field, where you can specify the filtering type for the selected Apex device. For more information on filtering types, see [Choose different smoothing options for each object on page 76](#).

## New hotkey/Tracker shortcut

A new hotkey (CTRL+E) creates a named object from selected markers.

This provides the same functionality as pressing the **Create** button in the **Create Object** section of the **Objects** tab.

## Auto-naming of new objects

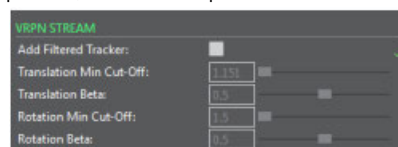
- Location: **Resources** pane > **Objects** tab > **Create Object** section

When you enter a name in the **Create Object** text box and click **Create**, the name is automatically incremented by 1, so that, to create another object with the default name of **ObjectName\_n**, you can just select the required markers and click **Create**.



## Additional VRPN output

- Location: **Resources** pane > **System** tab > **Local Vicon System** > **Properties** pane (to see all options, click **Show Advanced**) > **VRPN Stream** section



If you are rendering the same object to different display types (for example, to both a large screen and an immersive environment such as a head-mounted display), to obtain smooth visualization on both display types, you are likely to need to apply different amounts of filtration for each.

## New features and functions

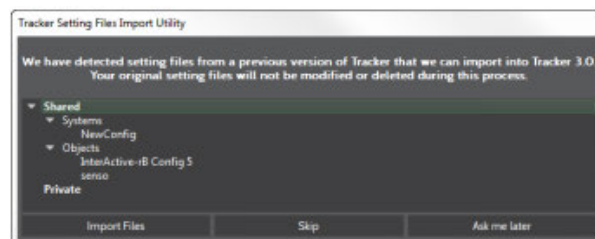
### \ Tracker 3.0 new features and functions \

To enable you to do this, Tracker 3.0 provides a second set of VRPN Trackers, which are output with the existing ones. For easy identification, the names of this second set of VRPN Trackers are suffixed with \_2.

The second set of VRPN Trackers includes customizable One Euro filtering. (For information on adjusting the filtering parameters, see [Choose different smoothing options for each object on page 76.](#))

## Easier upgrading

To make data migration easier between Tracker upgrades, you are given the option of migrating and updating shared user data stored in the old location (ProgramData\Vicon\Tracker) into the new location (C:\Users\Public\Documents\Vicon\Tracker3.x).



## Improved analysis and troubleshooting for captured data

- Location: **Resources** pane > **Recording** tab

For each trial recorded, at least three files are saved: .x2d, .system, and .xcp files. With Vicon Tracker 3.0, an .x2d file containing the latest calibration data, of the format LatestCalibration yyyyymmddnnnnnn.x2d, is also saved in the same location as the .x2d containing the recorded trial data.

The file that contains the calibration data can be useful for data analysis and troubleshooting. When you have captured a trial, you can find the calibration .x2d in the same location as the .x2d of the recorded trial.

## New features and functions

\ Tracker 3.0 new features and functions \

### New Track mode minimizes output latency

- Location: **Resources** pane > **Objects** tab > **Object Tracking Mode** section > **Track** mode button



To minimize output latency, the new Track mode prevents the display of unlabeled markers in the 3D Perspective view. Because viewing unlabeled reconstructions requires additional processing, for lowest output latency, when you have finished creating objects, click the Track button to change to Track mode.

To turn off the display of unlabeled reconstructions:

- In the **Resources** pane, click the **Objects** tab and ensure that in the **Object Tracking Mode** section at the bottom of the tab, **Track** mode is selected. When Track mode is selected, the Track button is green. This mode switches off the display of unlabeled reconstructions in 3D Perspective view.

### Set Camera view background to Threshold value

- Location: **Options** dialog box > **General View Options** section > **Threshold** option

To help you to determine the most effective threshold setting for grayscale blobs, you can set the background color of the **Camera** view to the value of the **Threshold** control in the **Centroid Fitting** section of the **Properties** pane. To do this:

1. Open the **Options** dialog box (F7), and in the **General View Options**, select **Threshold**.
2. On the **System** tab, select the camera and ensure that the view pane is displaying a **Camera** view.

## New features and functions

\ Tracker 3.0 new features and functions \

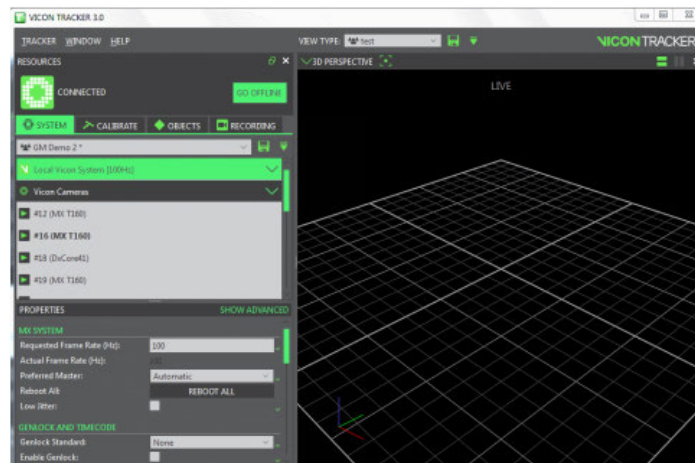
3. For each camera, in the **Properties** pane:
  - a. In the **Settings** section, ensure **Grayscale Mode** is set to **All**.
  - b. In the **Centroid Fitting** section, adjust the camera's **Threshold** settings to obtain the clearest possible view of the blobs, with minimal flickering in the **Camera** view.

## Automatic selection of cameras and view for masking and calibration

- Location: **Resources** pane > **Calibrate** tab > **Create Camera Masks** and **Calibrate Cameras** sections > **Start** button

A new time-saving feature of Tracker 3.0 improves the process of masking and calibration.

When you begin masking or calibration by clicking the **Start** button in the **Create Camera Masks** or **Calibrate Cameras** sections, the cameras are automatically selected and the view pane displays **Camera** views of all the selected cameras.



## New features and functions

\ Tracker 3.0 new features and functions \

### Change in Shared data locations

In Vicon Tracker 3, data is saved in the following folders:

- Shared files are saved in the appropriate sub-folder in: C:\Users\Public\Documents\Vicon\Tracker3.x\
- Private files are saved in the appropriate sub-folder in: C:\Users\UserName\AppData\Roaming\Vicon\Tracker3.x\

### Change in default Minimum Cameras to Start Trajectory

- Location: Resources pane > System tab > Local Vicon System node > Properties pane > Reconstruction section

The Local Vicon System property Minimum Cameras to Start Trajectory specifies the number of cameras that must see the same marker to create a new reconstruction and potentially form a new trajectory.

In Tracker 3.0, the default value for this property is 3 (ie three cameras), so if you are using a two-camera system, ensure you change the value to two before starting to work with Tracker.

## Vicon Tracker addressed issues

# Vicon Tracker addressed issues

For information on issues addressed in each point release of Vicon Tracker 3, see:

- [Addressed issues in Vicon Tracker 3.10 on page 88](#)
- [Addressed issues in Vicon Tracker 3.9 on page 89](#)
- [Addressed issues in Vicon Tracker 3.8 on page 90](#)
- [Addressed issues in Vicon Tracker 3.7 on page 91](#)
- [Addressed issues in Vicon Tracker 3.6 on page 92](#)
- [Addressed issues in Vicon Tracker 3.5 on page 93](#)
- [Addressed issues in Vicon Tracker 3.4 on page 94](#)
- [Addressed issues in Vicon Tracker 3.3 on page 95](#)
- [Addressed issues in Vicon Tracker 3.2 on page 96](#)
- [Addressed issues in Vicon Tracker 3.1 on page 97](#)
- [Addressed issues in Vicon Tracker 3.0 on page 98](#)

## Vicon Tracker addressed issues

\ Addressed issues in Vicon Tracker 3.10 \

## Addressed issues in Vicon Tracker 3.10

- Tracker no longer stops responding occasionally during calibration.
- You can now import Tobii VSK files from *C:\Program Files\Vicon\Tracker3.#\ModelTemplates* as objects in Tracker.



## Vicon Tracker addressed issues

\ Addressed issues in Vicon Tracker 3.9 \

## Addressed issues in Vicon Tracker 3.9

- Update to Camera Reprogramming Tool 1.3.2. This fixes a crash reported by a small number of customers
- Ensures that displayed global angles are updated correctly when moving between live and offline modes, and when changing frame
- It is no longer possible to save the system file during camera calibration as this caused issues with reconstruction output.
- Prevented object preset from being changed in GUI during capture to avoid incomplete change
- Analytics messages in various places have been consolidated to reduce unnecessary data transmission

## Vicon Tracker addressed issues

\ Addressed issues in Vicon Tracker 3.8 \

## Addressed issues in Vicon Tracker 3.8

- Tracker no longer stops when opening a file dialog box in some recent versions of Windows.
- Improvement in the behavior of calibrate selected cameras.
- Improvement in the reporting of the failure of individual cameras to calibrate.
- Network latency is now available in datastream output.
- Precision of values in CSV output is now fixed.
- The datastream now shows output for a generic analog signal set up as a Force component.
- Tracker Python SDK no longer conflicts with Nexus Python SDK when both are installed on the same machine.
- You can now re-number the cameras by selecting Auto Number in Vicon Control.
- Issues loading VSKs when Windows 10 version is updated to the 1809 Update and Windows Regional Setting is not English (United Kingdom) no longer occur.
- Tracker no longer stops working on startup due to IP conflict when two identical IP addresses are detected.
- Export CSV now correctly exports data containing occluded frames with commas in the output file.
- Preview mode now works correctly for Vantage and Vero cameras.
- Tracker no longer recenters the image position of a locked camera view if you cause the windowed area to be modified by changing system frame rate.
- Re-calibrating with multiple cameras selected now re-calibrates all selected cameras.

## Vicon Tracker addressed issues

\ Addressed issues in Vicon Tracker 3.7 \

## Addressed issues in Vicon Tracker 3.7

- Tracker no longer crashes when opening the Capture panel in Control 1.3

## Vicon Tracker addressed issues

\ Addressed issues in Vicon Tracker 3.6 \

## Addressed issues in Vicon Tracker 3.6

### Addressed issues in Vicon Tracker 3.6.1

- Objects loaded/created with spaces no longer produce unintended results.
- Default reconstructions for 3.6 now produce the expected results.

### Addressed issues in Vicon Tracker 3.6

- Multiple small objects that are close together can now be tracked simultaneously.
- The C++ example code that is supplied with the Vicon DataStream SDK and described in Accessing Vicon Tracker data from Simulink, now compiles and links successfully.
- Improvements in labeling for large object counts.

## Vicon Tracker addressed issues

\ Addressed issues in Vicon Tracker 3.5 \

## Addressed issues in Vicon Tracker 3.5

- Enabling/disabling multiple selected Objects and Groups is now successful.
- CSV export now exports unlabeled reconstructions.
- Importing system files no longer results in a crashdump.
- No crash on clicking **Recalibrate object** button.
- You can now assign object filter type with previously problematic system files.
- Tracker now takes a normal time to start when not connected to a network license server.
- Low jitter parameters are now respected offline.
- Playback no longer stops at midnight.
- Apex now comes back after turning off in a live system.
- Reading .xcp file containing 3-parameter Calibration model in older versions no longer causes incorrect behavior.

## Vicon Tracker addressed issues

\ Addressed issues in Vicon Tracker 3.4 \

## Addressed issues in Vicon Tracker 3.4

- Add marker to object now works correctly.
- Sound playback is not delayed.
- Tracker now correctly delivers UDP items per packet.
- Apex remains connected.
- Revert view type no longer causes Tracker to hang.

## Vicon Tracker addressed issues

\ Addressed issues in Vicon Tracker 3.3 \

## Addressed issues in Vicon Tracker 3.3

- The marker position parameter for objects no longer intermittently auto locks itself.
- Improved the reliability of VPRN outputs for Apex devices to ensure they contain changes for button presses.
- Improved the application start up time for Tracker if Bonjour has not been installed.
- The DSP for a camera is now disabled when low jitter is enabled in the system file.
- Corrected a behavior where the **Set Origin** command fails when the wand type is set to **5 Marker Wand & L-Frame**.
- Euler angles within the **CSV Export** operation are now output as axis angles.
- The **CSV Export** operation now shows a progress bar.
- You can now cancel **CSV Export**.
- A memory leak while tracking for long periods has been addressed.
- Calibration no longer fails silently if one or more disconnected cameras are present in the system.
- Timecode is now correctly displayed in offline.
- Improved the reliability of latency metrics that are displayed in a **Graph** view for high object count & high frame rate.
- Filtering offline now fully matches live behavior.
- A behavior where you were unable to set an object's marker local coordinates manually has been corrected.

## Vicon Tracker addressed issues

\ Addressed issues in Vicon Tracker 3.2 \

## Addressed issues in Vicon Tracker 3.2

- Mask|Start grayed out with only three cameras.
- Camera Attributes | Status | check marks in check boxes are difficult to see.
- Pausing offline playback unlabels/labels after playback has paused.
- Menu items have three different states.
- Reconstructor can behave differently in 2.2 and 3.0.
- Unresponsive state switching from Perspective to Graph view.



## Vicon Tracker addressed issues

\ Addressed issues in Vicon Tracker 3.1 \

## Addressed issues in Vicon Tracker 3.1

- Auto masking cannot be limited to a subset of all cameras.
- Analog data from Apex cuts out.

## Vicon Tracker addressed issues

\ Addressed issues in Vicon Tracker 3.0 \

## Addressed issues in Vicon Tracker 3.0

- Misleading units on graph when multiple analog device outputs are selected.
- Recorded trial holds old system configuration data.
- Tracker 2.0 | Other Devices | Add Interaction Device | Re-adding previously seen but deleted devices can result in device not being added.
- Offline performance issues.
- Tracker | Options | Reflection is not working when Solid floor is selected.
- Disconnect and reconnect of multiple Apex devices results in differences in segment names.
- Tracker 2.1 | Objects | Object position and rotation properties are still grayed out in pause.
- Tracker 2.1 | Objects | Object manipulation in offline appears broken directly after editing.
- Tracker | Documentation | Using Chrome to open contents causes continued reloading of page.

## Vicon Tracker known issues

For information on known issues in each point release of Vicon Tracker 3, see:

- [Known issues in Vicon Tracker 3.10 on page 100](#)
- [Known issues in Vicon Tracker 3.9 on page 101](#)
- [Known issues in Vicon Tracker 3.8 on page 102](#)
- [Known issues in Vicon Tracker 3.7 on page 103](#)
- [Known issues in Vicon Tracker 3.6 on page 104](#)
- [Known issues in Vicon Tracker 3.5 on page 105](#)
- [Known issues in Vicon Tracker 3.4 on page 106](#)
- [Known issues in Vicon Tracker 3.3 on page 107](#)
- [Known issues in Vicon Tracker 3.2 on page 108](#)
- [Known issues in Vicon Tracker 3.1 on page 109](#)
- [Known issues in Vicon Tracker 3.0 on page 110](#)

## Vicon Tracker known issues

\ Known issues in Vicon Tracker 3.10 \

## Known issues in Vicon Tracker 3.10

- Intermittently, when you open Tracker and display a Camera view for the cameras, you may observe that the camera stops shipping data.
- If you create an object without saving it, then try to close Tracker, you are prompted to choose whether to share your objects. If you choose Shared, but then assign an object in the subsequent dialog box, the object appears in both shared and private folders.
- Angle values in the Datastream and CSV export do not match numerically. This is due to the additional processing that is used by the CSV export to remove discontinuities in its output and match the data within a graph view. This processing is not performed in the datastream.

The following issues are related to Firmware 802 only:

- When Tracker is opened, Valkyrie cameras may reboot multiple times before becoming stable.
- Data delivered latency spikes periodically.

## Vicon Tracker known issues

\ Known issues in Vicon Tracker 3.9 \

## Known issues in Vicon Tracker 3.9

- Setting the camera calibration parameter **Calibration Type** to **Calibration Refinement** has the same effect as selecting **Full Calibration**.

## Vicon Tracker known issues

\ Known issues in Vicon Tracker 3.8 \

## Known issues in Vicon Tracker 3.8

- Setting the camera calibration parameter **Calibration Type** to **Calibration Refinement** has the same effect as selecting **Full Calibration**.

## Vicon Tracker known issues

\ Known issues in Vicon Tracker 3.7 \

## Known issues in Vicon Tracker 3.7

None.

## Vicon Tracker known issues

\ Known issues in Vicon Tracker 3.6 \

## Known issues in Vicon Tracker 3.6

- If you use variations on upper/lower case, you can create multiple object presets with the same name (eg, Test and test).
- When using only one camera with an Apex device, the Apex is displayed intermittently.



## Vicon Tracker known issues

\ Known issues in Vicon Tracker 3.5 \

## Known issues in Vicon Tracker 3.5

- Recalibrating with multiple cameras selected re-calibrates only one camera.
- Hang on startup with Vue/Bonita video connected.
- Crash on exit if Tracker is opened on a machine already running Nexus.
- Tracker hangs if started without a previously used dongle attached.
- Capture/Calibration is stopped if camera errors occur.
- Creation of objects cannot be undone.

## Vicon Tracker known issues

\ Known issues in Vicon Tracker 3.4 \

## Known issues in Vicon Tracker 3.4

- CSV export doesn't export unlabeled reconstructions.
- Tracker hangs if started without a previously used dongle attached.
- Capture/Calibration is stopped if camera errors occur.
- Creation of objects cannot be undone.

## Vicon Tracker known issues

\ Known issues in Vicon Tracker 3.3 \

## Known issues in Vicon Tracker 3.3

None.

## Vicon Tracker known issues

\ Known issues in Vicon Tracker 3.2 \

## Known issues in Vicon Tracker 3.2

- Need to click Yes to use license for each feature when use trial license dialog is displayed.
- Subject list drop down does not automatically resize.
- Cannot add Apex if Apex has been added in a second system file.
- Calibration fails if one or more cameras are blank.

## Vicon Tracker known issues

\ Known issues in Vicon Tracker 3.1 \

## Known issues in Vicon Tracker 3.1

Issue	Explanation/Workaround
When the system frame rate is set above 80Hz, if you enable Preview mode, no preview is displayed for Vantage cameras (the Camera view is blank).	To use Preview mode for Vantage cameras, select a system frame rate below 80Hz. To be addressed in a future release.
Object creation cannot be undone.	You cannot use Undo (CTRL+Z) after creating an object. To remove the object, delete it instead of using Undo.
Rotation causes translation for an object aligned to global axes.	In some circumstances (e.g, when a small object is very distant from the origin) rotation along a particular axis, e.g, the X axis, for an object that is aligned to the global axes, causes a significant translation along the Y axis.
Tracker fits absent Apex to objects in the capture volume	If an Apex is present in a capture volume containing an object such as an Active Wand or a rigid body plate, and you add the Apex to the <b>System</b> tree and then remove the Apex from the capture volume, Tracker may fit the absent Apex to an object in the capture volume. To avoid this issue, whenever you are not using the Apex in the capture volume, turn it off.
Cameras set to different strobe intensities cause Apex or Active wand to sync incorrectly with the camera system	When using either an Apex or an Active Wand, unwanted effects (for example, jitter in tracking) are caused by using cameras at different strobe intensities or if one or more disabled cameras is present in the capture volume. To avoid this issue, ensure all cameras are set to the same strobe intensity and that there are no disabled cameras in the volume.

## Vicon Tracker known issues

\ Known issues in Vicon Tracker 3.0 \

## Known issues in Vicon Tracker 3.0

Issue	Explanation/Workaround
Object creation cannot be undone.	You cannot use Undo (CTRL+Z) after creating an object. To remove the object, delete it instead of using Undo.
Auto masking cannot be limited to a subset of all cameras.	If you select a subset of all the available cameras and click <b>Start</b> in the <b>Create Camera Masks</b> section of the <b>Calibrate</b> tab, all camera views are displayed and all are masked.
Rotation causes translation for an object aligned to global axes.	In some circumstances (e.g, when a small object is very distant from the origin) rotation along a particular axis, e.g, the X axis, for an object that is aligned to the global axes, causes a significant translation along the Y axis.
Apex jitter caused by switching between Continuous and Strobe mode.	With an Apex set to its default <b>LED Intensity</b> of 2 in Tracker, or if it is set to 3, in situations where the Apex switches between being synchronized with the cameras and not being synchronized, it alternates between <b>Strobe</b> mode (synchronized) and <b>Continuous</b> mode (not synchronized). This causes tracking to jitter. To avoid this effect, in the <b>General</b> section of the <b>Properties</b> pane, either change the <b>LED Intensity</b> setting to 1 or select <b>Continuous Mode</b> . Note that if you select <b>Continuous Mode</b> , power consumption increases, causing the battery to be depleted more quickly.
Tracker fits absent Apex to objects in the capture volume	If an Apex is present in a capture volume containing an object such as an Active Wand or a rigid body plate, and you add the Apex to the <b>System</b> tree and then remove the Apex from the capture volume, Tracker may fit the absent Apex to an object in the capture volume. To avoid this issue, whenever you are not using the Apex in the capture volume, turn it off.

## Vicon Tracker known issues

\ Known issues in Vicon Tracker 3.0 \

Issue	Explanation/Workaround
Cameras set to different strobe intensities cause Apex or Active wand to sync incorrectly with the camera system.	When using either an Apex or an Active Wand, unwanted effects (for example, jitter in tracking) are caused by using cameras at different strobe intensities or if one or more disabled cameras is present in the capture volume. To avoid this issue, ensure all cameras are set to the same strobe intensity and that there are no disabled cameras in the volume.
Apex is not compatible with VR cameras.	To maximize battery life, the Apex does not emit both frequencies of light that are required to support Visible Red (VR) cameras, so the Apex cannot be used in systems with VR strobes.
Analog data from Apex cuts out	If an Apex is left running with <b>Graph</b> view displayed in Tracker, after a minimum period of about 10 minutes, the analog data may cut out and the graph view shows no Apex data. If this issue occurs, perform a manual resync.