

What's new in Vicon Nexus 2.8

Vicon Nexus 2.8 is a point release that provides features and enhancements in addition to those that were included in earlier releases of Nexus 2.

Nexus 2.8 new features and functions

Nexus 2.8 provides the following new features and enhancements:

- Visualize Plug-in Gait segment centers of mass
- Conventional Gait Model 2
- Python scripts for easier modeling
- Improvements to working with IMUs
- Ability to calculate step width and limp index
- Close trials using the SDK
- Automatic notification of firmware updates
- Updates to Vicon software

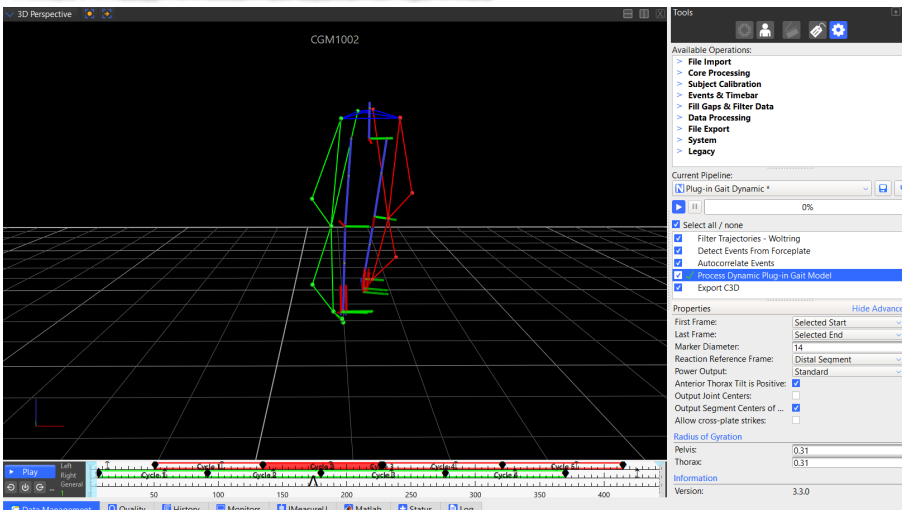
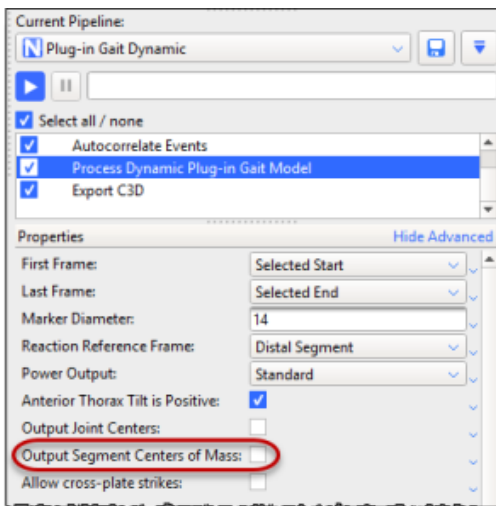
For a description of the other features and enhancements that have been released since Nexus 2.0, see the other [Nexus What's New PDFs](#).

To watch Nexus videos and tutorials, visit the [Nexus 2 playlist on YouTube](#).

Visualize Plug-in Gait segment centers of mass

Location: **Tools** pane > **Pipelines** tab > **Data Processing** pipeline operations > **Process Dynamic Plug-in Gait Model** operation

A new option in the **Properties** for the **Process Dynamic Plug-in Gait Model** operation enables you to visualize the center of mass of each segment that is calculated by Plug-in Gait.



Conventional Gait Model 2

You can now use the Conventional Gait Model 2 (CGM2) from within Nexus so that you can execute the various CGM2 models on your data. It is available from the [Vicon website](#) as a separate download that is in addition to the Nexus 2.8 installer.

The Conventional Gait Model 2 (CGM2) has been developed by Dr Fabien Leboeuf (University of Salford), and partly funded by Vicon. It is an open-sourced biomechanical model developed in Python 2. By focusing on areas where it was known improvements could be made, the design of the CGM2 model enhances the Conventional Gait Model whilst maintaining its strengths.

pyCGM2 is compatible with versions of Nexus from 2.7 and later.

The installer provides CGM2 VSTs and CGM2 biomechanical models.

For more information, see the following links:

- For more details about the model: <https://pycgm2.github.io/>
- To set up the Python environment: <https://pycgm2.github.io/pages/pythonInstallation>
- To download the CGM2 installer and its documentation: <https://www.vicon.com/downloads/models-and-scripts/cgm2>

Python scripts for easier modeling

The following additional Python scripts are provided to make it simpler to develop Python models with Nexus.

- NexusAngles.py
- NexusObject.py
- NexusSegment.py
- NexusTrajectory.py

To use the scripts, add the following commands to the Python path:

- C:\Program Files (x86)\Vicon\Nexus2.8\SDK\Python

and, depending on your system:

- C:\Program Files (x86)\Vicon\Nexus2.8\SDK\Win64

or

- C:\Program Files (x86)\Vicon\Nexus2.8\SDK\Win32

Improvements to working with IMUs

The following changes further integrate Vicon IMUs into the Nexus workflow.

- [New IMeasureU tab](#)
- [Work with IMU Research input](#)
- [Additional IMU collection modes](#)

Important

Vicon IMUs are supported for use with Nexus for research purposes only. For full sensor safety and regulatory details, see the [Vicon Blue Trident Model](#)

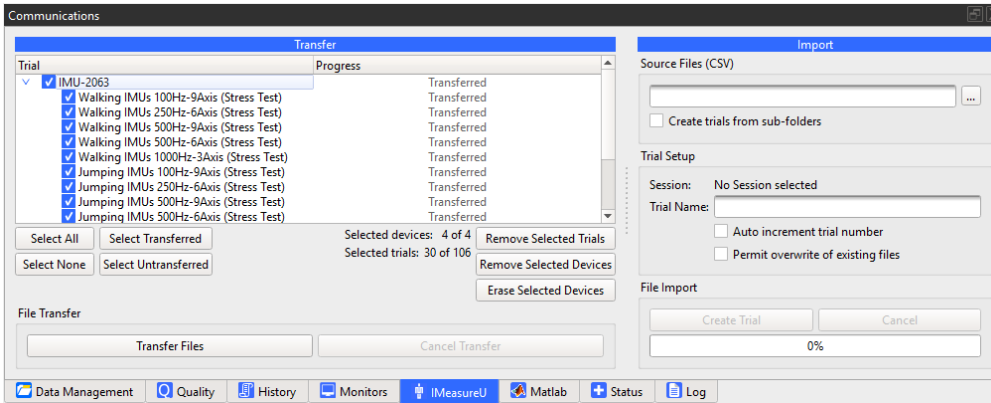
[V2 Safety and Regulatory Information](#).

New IMeasureU tab

To connect IMUs in Nexus 2.8, you must update them via the IMeasureU Research app, available from the App Store, to 1.3 firmware or later.

Location: **Communications** pane

To make it easier to work with data from Vicon IMUs, the controls for working with IMU data can now be found on the new **IMeasureU** tab in the Communications pane.



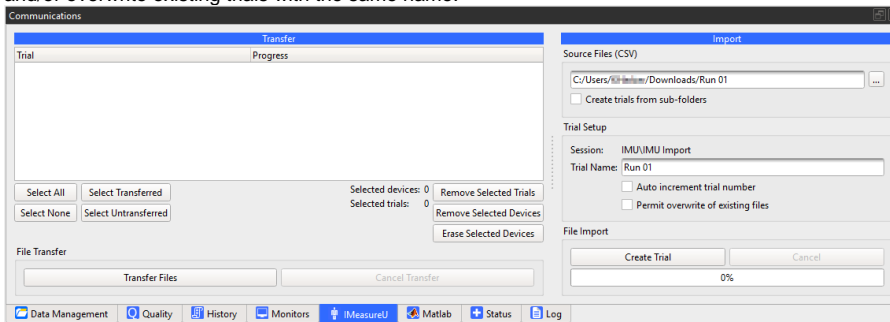
Work with IMU Research input

Location: **Communications** pane > **IMeasureU** tab > **Import** section

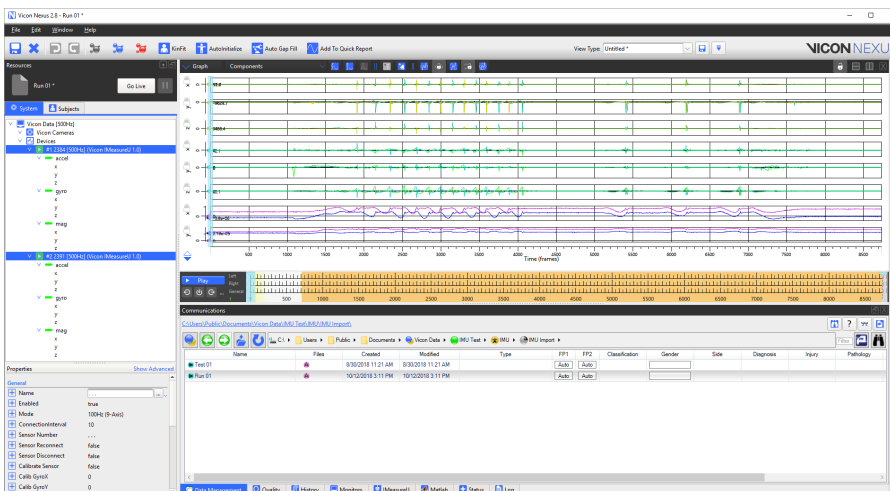
You can capture data using IMeasureU Research app and then import the downloaded CSV files from Lightning into Nexus.

To work with IMU Research input:

1. On the **Data Management** tab, make sure you have selected the session into which you want to import your IMU Research files.
 2. On the **IMeasureU** tab, in the **Import** section enter or browse to the relevant folder to import the CSV file(s) that you downloaded from Lightning.
- If you have downloaded multiple files to sub-folders, select **Create trials from sub-folders**.
3. In the **Trial Name** field, enter a name for the trial that will be imported. If required, select the options to automatically increment the trial numbers and/or overwrite existing trials with the same name.

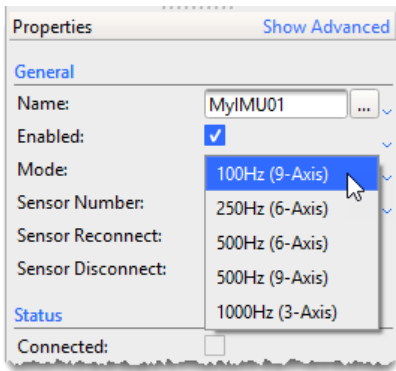


4. Click **Create Trial**.
Files with the extension **.x1d** are created in the location you selected in Step 1.
You can view IMU Research data in the Graph pane in Nexus.



Additional IMU collection modes

Location: **System Resources** pane > **System tree** > **Devices** node > **Add Digital Device** > **IMeasureU** sensor node > **Properties** pane > **General** section > **Mode** dropdown



When setting up IMUs to capture with Nexus (see [Configure IMUs](#)), you can now select from two additional collection modes (frequencies) at which the IMUs are to run:

- Capture IMU acceleration data (3-axis) at 1000 Hz
To enable the IMUs to run at 1000 Hz, your firmware must be at version 1.3 or later. If you are using earlier firmware, when you select 1000 Hz, you are prompted to upgrade to the required version.
- Note that IMU firmware is upgraded via IMU Research only.
- Capture IMU acceleration data (9-axis) at 500 Hz.
Note that as the IMU magnetometer rate has a maximum frequency of 100 Hz, when the Mode is set to 500 Hz (9-axis), the firmware repeats the last reading to make up the difference between the output data rate of the magnetometer compared with that of the accelerometer/gyroscope.

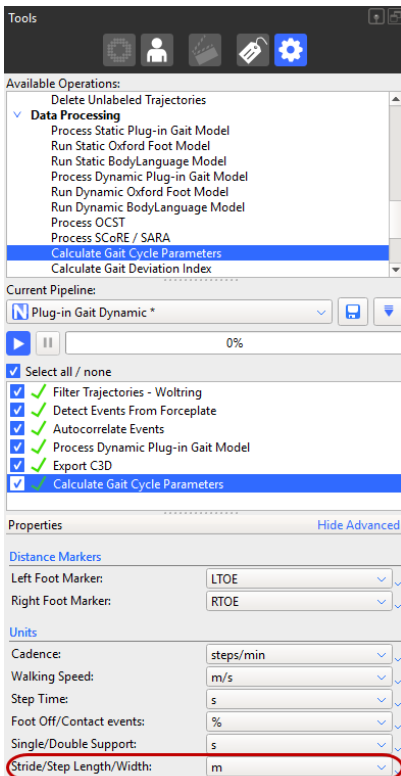
Ability to calculate step width and limp index

Location: **Tools** pane > **Pipeline** tab > **Data Processing** operations > **Calculate Gait Cycle Parameters** operation

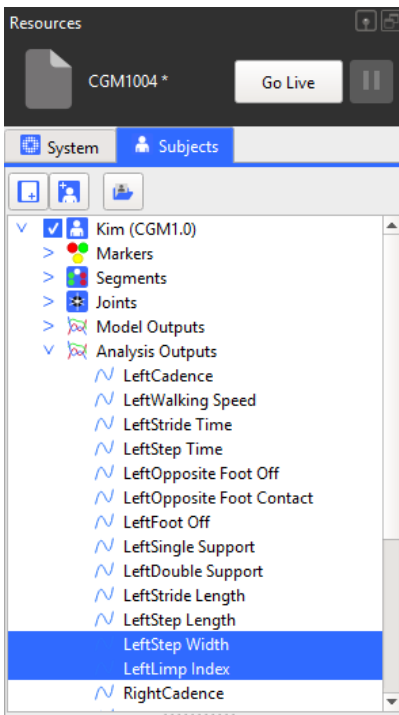
The **Calculate Gait Cycle Parameters** pipeline operation now includes the calculation of step width and limp index.

To calculate step width and limp index:

1. Ensure your trial data includes both **Foot Strike** and **Foot Off** events. If it doesn't, either recapture the data or [add the missing events](#).
2. Add the **Calculate Gate Cycle Parameters** operation to your current pipeline in the [usual way](#).
3. In the **Properties** pane, ensure that the units for the **Stride/Step Length/Width** setting are as required.



4. Run the **Calculate Gate Cycle Parameters** operation on your data.
In the **Subjects Resources** pane, notice that both step width and limp index are included in the **Analysis Outputs**.



On the **Log** tab, notice that step width and limp index data is displayed.

Time	Category	Text
13:10:26.893	Calculate Gait Cycle Parameters	Kim: Left Opposite Foot Contact 43 %
13:10:26.893	Calculate Gait Cycle Parameters	Kim: Left Foot Off 68 %
13:10:26.893	Calculate Gait Cycle Parameters	Kim: Left Single Support 0.28 s
13:10:26.893	Calculate Gait Cycle Parameters	Kim: Left Double Support 0.27 s
13:10:26.893	Calculate Gait Cycle Parameters	Kim: Left Stride Length 1.1 m
13:10:26.893	Calculate Gait Cycle Parameters	Kim: Left Step Length 0.64 m
13:10:26.893	Calculate Gait Cycle Parameters	Kim: Left Step Width 0.14 m
13:10:26.893	Calculate Gait Cycle Parameters	Kim: Left Limp Index 1.1
13:10:26.893	Calculate Gait Cycle Parameters	Kim: Right Cadence 150 steps/min
13:10:26.893	Calculate Gait Cycle Parameters	Kim: Right Walking Speed 1.7 m/s
13:10:26.893	Calculate Gait Cycle Parameters	Kim: Right Stride Time 0.798 s

Close trials using the SDK

You can now use the SDK to close the current trial without saving. This functionality is available for both MATLAB and Python.

The function requires the following call:

```
vicon.CloseTrial(timeout)
```

`timeout` is in milliseconds and specifies the length of time during which the function tries to run.

Note that the command can only be used from an external application such as MATLAB or Python, and cannot be used in a script that is executed from within Nexus.

The following example uses Python:

```
import ViconNexus

vicon = ViconNexus.ViconNexus()
subject = vicon.GetSubjectNames()
vicon.CloseTrial(200)
```

Note that this call function is not listed by using `DisplayCommandList`. To display details about the call, use `vicon.DisplayCommandHelp('CloseDontSave')`.

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.

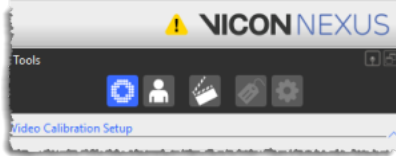
 **Important**

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

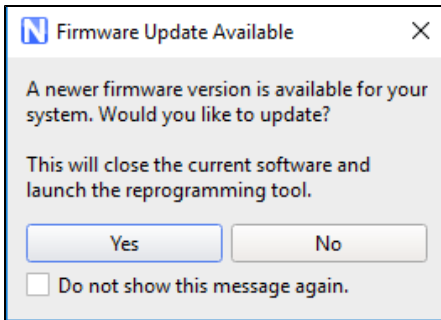
To monitor and/or upgrade system firmware:

1. When you start Nexus or connect any Vicon devices into your system, Nexus checks to see whether the firmware for all your devices is up-to-date.

If your devices aren't using the latest firmware, Nexus displays an icon in the toolbar to let you know that a more up-to-date version of the firmware is available:

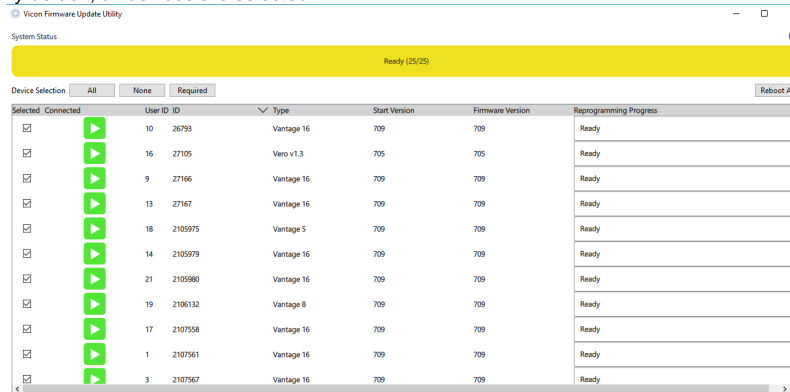


2. Click on the icon to display more information. Nexus displays a prompt that enables you to open the Vicon Firmware Update Utility (reprogramming tool).

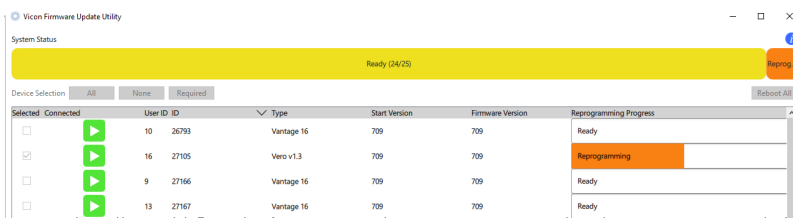


3. Click Yes to open the Vicon Firmware Update Utility. Note that you can also open the Vicon Firmware Update Utility from the **Start** menu (select **Vicon** > **Vicon Firmware Update Utility**).

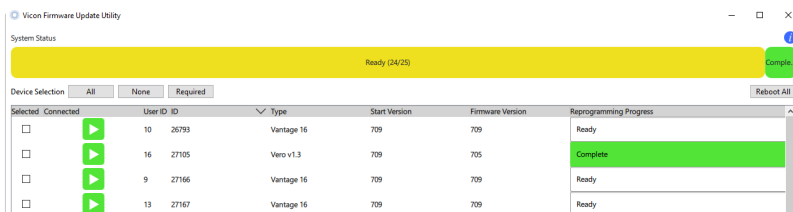
Nexus closes and the Vicon Firmware Update Utility is displayed, showing all the connected devices and their current firmware version. By default, all devices are selected.



4. 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.
5. At the bottom of the Vicon Firmware Update Utility window, in the **Choose Firmware version** list, select or browse to the required firmware version.
6. 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.



i Note

If you do not have continual internet access, Nexus 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.

Updates to Vicon software

- Updated Vicon Video Viewer (1.5)
- New Vicon ProEclipse (1.2)
- Patch release of Vicon ProCalc (1.2.1)

See also [Requirements for Nexus 2.8](#).