
CGM2 User Guide

Contents

Getting started with CGM2	3
Set up the Python environment	4
Install pyCGM2.....	5
Use pyCGM2 in Vicon Nexus.....	6
CGM2 VSTs.....	7
Running the static CGM2 model	8
Running the dynamic CGM2 model.....	9
Running Plug-in Gait & CGM2 models on the same dataset.....	10
Known issues for CGM2	11

© Copyright 2018 Vicon Motion Systems Limited. All rights reserved.

Vicon Motion Systems Limited reserves the right to make changes to information in this document without notice. Companies, names, and data used in examples are fictitious unless otherwise noted. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic or mechanical, by photocopying or recording, or otherwise without the prior written permission of Vicon Motion Systems Ltd. Vicon® is a registered trademark of Oxford Metrics plc. Vicon Blade™, Vicon Control™, Vicon Lock™, Vicon Lock+™, Vicon Lock Lab™, Vicon Lock Studio™, Vicon MX™, Vicon Nexus™, Vicon Pegasus™, Vicon ProCalc™, Vicon Pulsar™, Vicon Shōgun™, Vicon Studio™, T-Series™, Vicon Tracker™, Vicon Vantage™, Vicon Vero™, Vicon Vertex™, and Vicon Vue™ are trademarks of Oxford Metrics plc.

VESA® is a registered trademark owned by VESA (www.vesa.org/about-vesa/). Other product and company names herein may be the trademarks of their respective owners. For full and up-to-date copyright and trademark acknowledgements, visit <https://www.vicon.com/vicon/copyright-information>.

Vicon Motion Systems is an Oxford Metrics plc company.

Email: support@vicon.com Web: <http://www.vicon.com>

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 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-source biomechanical model developed in Python 2. By focusing on areas where known improvements could be made, the design of the CGM2 model enhances the Conventional Gait Model whilst maintaining its strengths.

The Vicon installer for CGM2 provides an easy-to-use implementation which can be included in the processing pipelines (VSTs and model pipelines) of Vicon Nexus 2.7 and above. CGM2 is designed to fit straight into the pipeline with the usual gait plug-ins such as the Woltring Filter, Gait Cycle event detection, and Plug-in Gait.

pyCGM2 (CGM2 installer) is compatible with versions of Nexus from 2.7 and later.

This guide contains the following information about setting up and using CGM2 with Nexus:

- [Getting started with CGM2 \(page 3\)](#)
- [Use pyCGM2 in Vicon Nexus \(page 6\)](#)
- [Known issues for CGM2 \(page 11\)](#)

Getting started with CGM2

To start using CGM2, complete the following procedures:

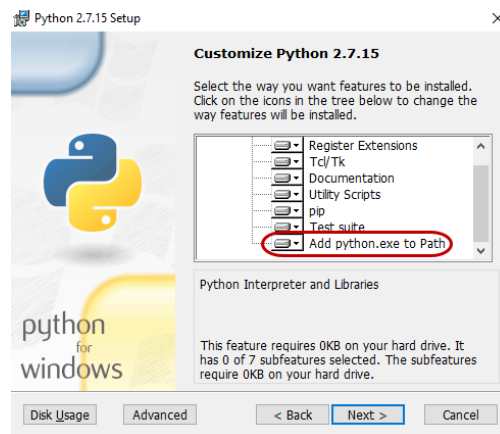
- [Set up the Python environment \(page 4\)](#)
- [Install pyCGM2 \(page 5\)](#)

Set up the Python environment

pyCGM2 requires Python 2.7 32-bit ONLY.

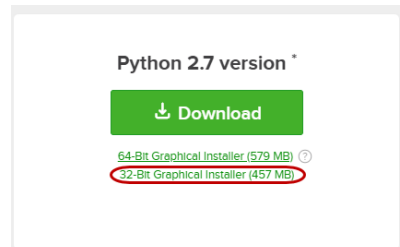
You can install your preferred python suite.

During the Python installation, ensure **Add python.exe to Path** is selected.

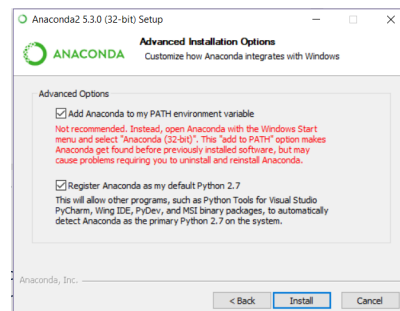


If you have no experience with Python, Dr Fabien Leboeuf recommends installing the Anaconda python suite.

Download and install Anaconda 32-bit Python 2.7.



During the Anaconda installation, in the **Advanced Installation Options** window, ensure both boxes are selected.

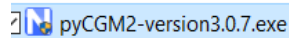


Install pyCGM2

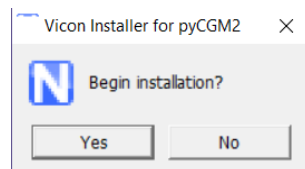
The installer provides CGM2 VSTs and CGM2 biomechanical models and places them automatically into the appropriate Vicon folders.

To install pyCGM2:

1. Download the Vicon installer from the Vicon website at:
<https://www.vicon.com/downloads/models-and-scripts/cgm2>
2. Unzip the pyCGM2 folder.
3. Double-click on the executable.



4. Click **Yes** to begin installation. This automatically opens a command window (cmd) that installs pyCGM2.



5. When the installation is complete, the following is displayed in the cmd window:

```
Finished processing dependencies for pyCGM2==3.0.7
```

6. Press any key.
pyCGM2 is now ready to use in Nexus.

Any errors during installation will be reported in the cmd window. For example if pyCGM2 fails to install, ensure your Python environment is set up and the Python path is enabled upon installation (see [Set up the Python environment \(page 4\)](#)).

Use pyCGM2 in Vicon Nexus

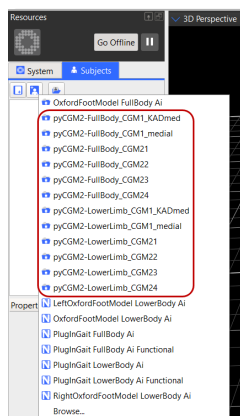
In this section:

- [CGM2 VSTs \(page 7\)](#)
- [Running the static CGM2 model \(page 8\)](#)
- [Running the dynamic CGM2 model \(page 9\)](#)
- [Running Plug-in Gait & CGM2 models on the same dataset \(page 10\)](#)

CGM2 VSTs

CGM2 VSTs are automatically installed and placed in:
C:\Users\Public\Documents\Vicon\Nexus2.x\ModelTemplates

Note that VSTs available for both lower and full body.



For more information about CGM2, see the following:

<https://pycgm2.github.io/>

Information about the CGM2 models:

- CGM 1.0 (Vicon Plug-in Gait Clone):
<https://pycgm2.github.io/pages/CGM10.html>
- CGM 1.1:
<https://pycgm2.github.io/pages/CGM11.html>
- CGM 2.1 (Hip Joint Center):
<https://pycgm2.github.io/pages/CGM21-Overview.html>
- CGM 2.2 (Inverse Kinematic):
<https://pycgm2.github.io/pages/CGM22-Overview.html>
- CGM 2.3 (Skin Clusters):
<https://pycgm2.github.io/pages/CGM23-Overview.html>
- CGM 2.4 (Forefoot):
<https://pycgm2.github.io/pages/CGM24-Overview.html>

Note that each subsequent model includes the improvements made in all prior models, e.g. skin cluster calculations, inverse kinematics and hip joint center calculations will also be applied within the forefoot model.

Information about marker placement:

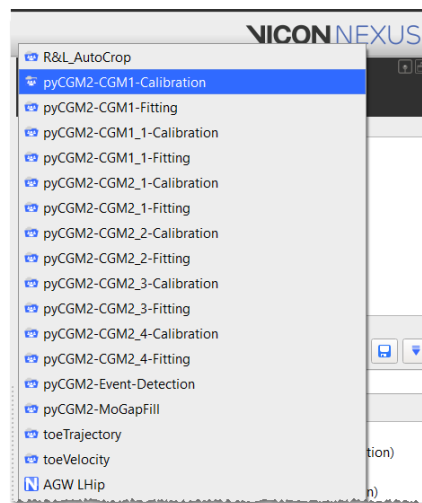
<https://pycgm2.github.io/pages/Palpation.html>

Running the static CGM2 model

For pyCGM2, this is referred as pycgm2-calibration.

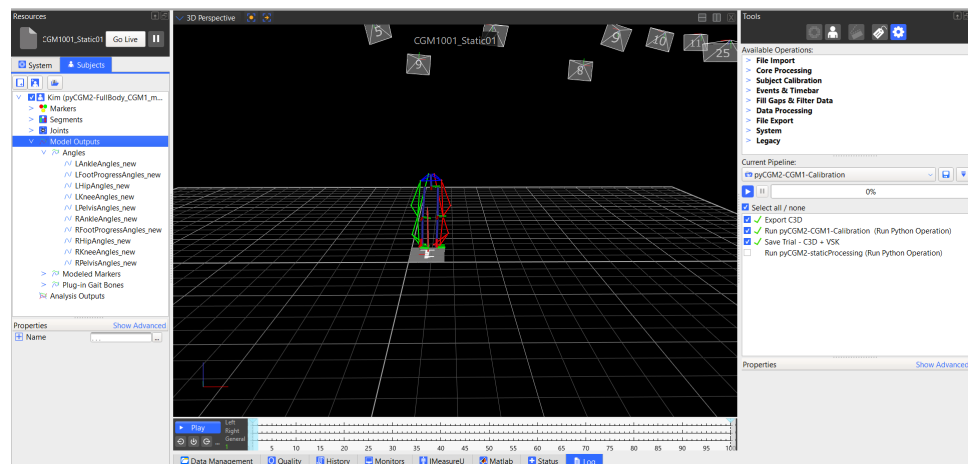
The pipelines will be automatically installed in

C:\Users\Public\Documents\Vicon\Nexus2.x\Configurations\Pipelines



To apply the model, run the **pycgm2-CGMx-calibration** pipeline.

The model outputs appear under the Subject tree.

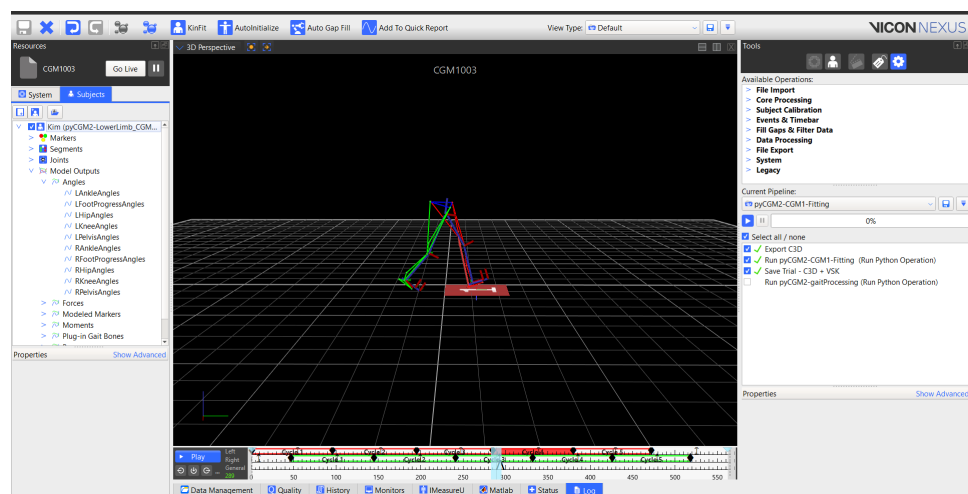


Running the dynamic CGM2 model

For pyCGM2, this is referred to as fitting.

To apply the model, run the **pycgm2-CGMx-fitting** pipeline.

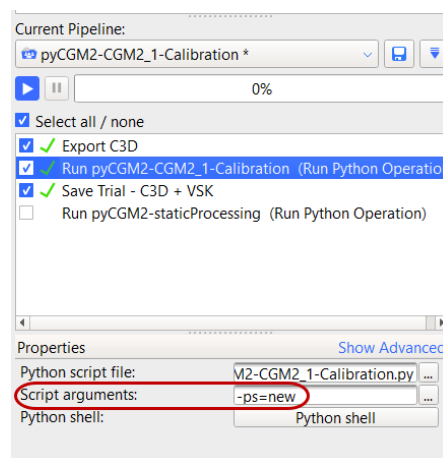
The model outputs appear under the Subject tree.



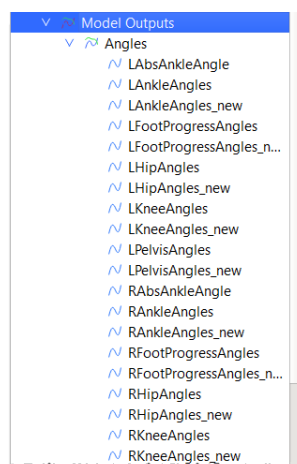
Running Plug-in Gait & CGM2 models on the same dataset

1. Run the Plug-in Gait model.
2. When running the pyCGM2-CGMx model for either a static or dynamic trial, include the following script argument:

`-ps=new`



This script argument lists both Plug-in Gait and CGM2 model outputs.



Known issues for CGM2

- If gaps at the beginning and end of the trial are present, CGM2.2 onwards may fail.
The trial must not have any gaps in the beginning or end to execute.
Note that gaps in the middle of the trial will appear the model.
- CGM2 is currently only a bilateral model.

For questions regarding CGM2, including the biomechanical model details and known issues, please contact Dr Fabien Leboeuf at:

<https://pycgm2.github.io/pages/contactus.html>

If you have any questions regarding the Vicon pyGM2, please contact support@vicon.com.¹

¹ <mailto:support@vicon.com>