

Theia

[Theia's markerless motion capture technology](#) integrates with Visual3D and Sift by exporting C3D files, allowing users to process, analyze, and visualize their data. Visual3D recognizes these C3D files as Theia3D output and automatically creates a model and assigns the associated motion file during import.

A standing (static) trial is generated virtually based on the parameters found within the movement trial, rather than requiring a separate static capture. Model segments and landmarks are created automatically based on the Theia data. It's important to note that Theia3D stores [ROTATION signals](#), not traditional TARGET signals. These ROTATION signals include the full six degrees of freedom (6 DOF) for each segment, as a 4x4 transformation matrix. When a ROTATION signal is selected for a segment location, only the position component is used unless further configuration is specified. Unless there is a specific need to modify the coordinate system, the ROTATION signal is directly assigned to the pose of the model segment without further processing. The ROTATION folder in **Signals and Events** displays all the ROTATION signals exported by Theia3D.

Each ROTATION signal consists of 17 float values per frame: sixteen values represent the 4x4 transformation matrix, and the seventeenth is a reliability metric. These signals are stored sequentially in the C3D file. This data type is used in practice because if a segment's origin is defined at the proximal end, the ROTATION matrix provides a description of both the position and orientation of that segment. This eliminates the need for additional calculations to estimate pose and makes data management easier, since the pose is a single signal.

This integration supports all Theia3D software versions including [Theia Axiom v2025](#), [Theia Apollo v2024](#), [Theia 2023](#), Theia 2022, and Theia 2021.

Merging Theia3D Files

Typically, users want to merge Theia3D's motion capture output and analog signals such as force platform recordings.

The [Manage_File_Merge](#) command is designed to merge multiple files that recorded data from the same motion capture trial. This command merges data types from each .c3d file into one trial in the Visual3D workspace. This command was originally called **Manage_Theia3D_Merge**, but since has been updated to be used for file types other than from Theia3D.

This pipeline command makes it simple to merge markerless motion capture files from Theia with marker-based motion capture files from [Qualisys QTM](#).

The following [sample data](#) can be used to follow along with the outlined steps in [Merge Theia with QTM Analog Data](#)

Loading Theia C3D Files into Sift

If wanting to import Theia C3D files into Sift the Theia Builder will be needed to build CMZ files from

the Theia3D outputs. Reference the tutorial here on how to use the Theia Builder: [Theia Builder](#)

The [command line](#) can now be used with Theia3D to perform batch analyses, users can create custom automated batch processing pipelines, see here for more information, [-RunTheiaBatch / -RunTheia / -RTB](#).

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Last update: **2025/11/13 14:59**

