



AMTI Digital Device Plugin Integration with Vicon Nexus

*Plugin version 1.14 (32 and 64-bit)
Requirement: Vicon Nexus 1.8.5 or newer*

Tech Note

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Overview

This technical note provides a step-by-step procedure to integrate the digital output of AMTI multi-axis force platforms with Vicon Nexus systems using an AMTI software “plugin”. The AMTI devices compatible with the plugin, as of June 2022, are Gen5 and OPTIMA amplifiers as well as the portable AccuSway-Optimized (ACS-O), AccuGait-Optimized (ACG-O), and AccuPower-Optimized (ACP-O).

Step 1: Amplifier Setup

Before beginning the integration into Vicon, make sure you have completed the **Quick Start Guide** (as appropriate for your model of equipment). The **Quick Start Guide** and all of the software required to complete it can be found on the USB stick that shipped in the AMTI binder with your system.

Step 2: Setup the AMTI Plugin

The digital integration is provided through a software plugin (vdd file) that calls a DLL (dynamically linked library). There is both a 64-bit and a 32-bit version of the vdd and DLL. The appropriate files should be selected based on your version of Nexus.

64-bit version

Required Files:

- AMTI Digital Device V1_13-64.vdd
- AMTIUSBDevice – 64.dll

The dll **must** be renamed to AMTIUSBDevice.dll and placed in the following folder:

C:\Windows\System32

The vdd file can keep its original name and should be placed in the following directory (if the *DigitalDevices* or *DigitalDevices64* folder does not exist, **create it** and insert the file):

For Nexus 2.13 and newer: *C:\Users\Public\Documents\Vicon\Nexus2.x\DigitalDevices64*

For Nexus 2.12 (64-bit): *C:\Users\Public\Documents\Vicon\Nexus2.x\DigitalDevices*

32-bit version

Required Files:

- AMTI Digital Device V1_13-32.vdd

The dll would have been automatically installed when you installed AMTI’s NetForce software.

The vdd file should be copied to the following directory, depending on the version of Nexus (if the *DigitalDevices* folder does not exist, **create it** and insert the file):

For Nexus 2.2 and newer: *C:\Users\Public\Documents\Vicon\Nexus2.x\DigitalDevices*

For Nexus 2.1: *C:\Program Files (x86)\Vicon\Nexus2.1\DigitalDevices*

For Nexus 2.0: *C:\Program Files (x86)\Vicon\Nexus2.0\DigitalDevices*

For Nexus 1.8: *C:\Program Files (x86)\Vicon\Nexus\DigitalDevices*

Step 3: Confirm Hardware Connections

The force platform system should now be connected to the Vicon computer via a USB cable as shown in the Quick Start Guide. If you are using more than one platform, you must use a powered USB-hub to connect all platforms through one USB port (contact AMTI for specifications).

Step 4: Using digital devices in Vicon Nexus

Once Nexus is running, you will need to install the platform(s) in your Local Vicon system. To do so, go to the Resources panel and right click on “Devices” (see Figure 1), hover over “Add Digital Device” and select “Add AMTI Gen5/Optima devices”.

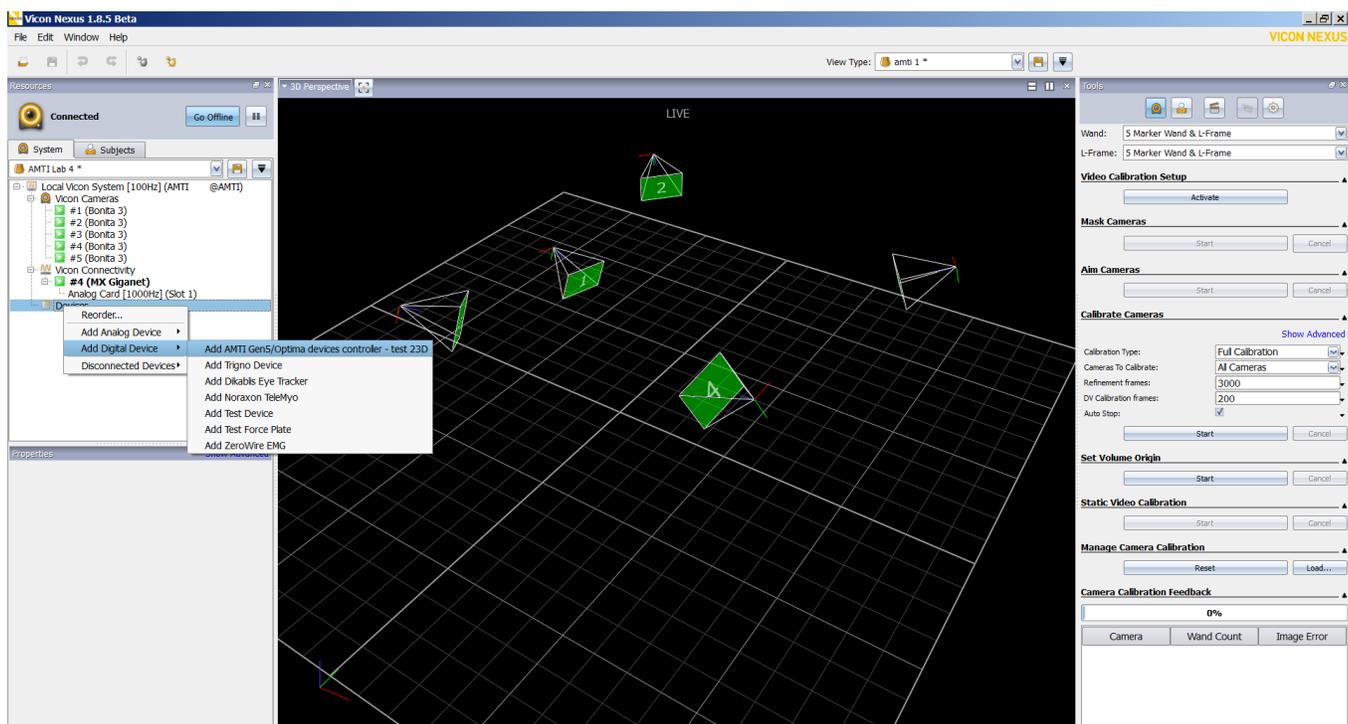


Figure 1- Integration of AMTI digital devices in Nexus

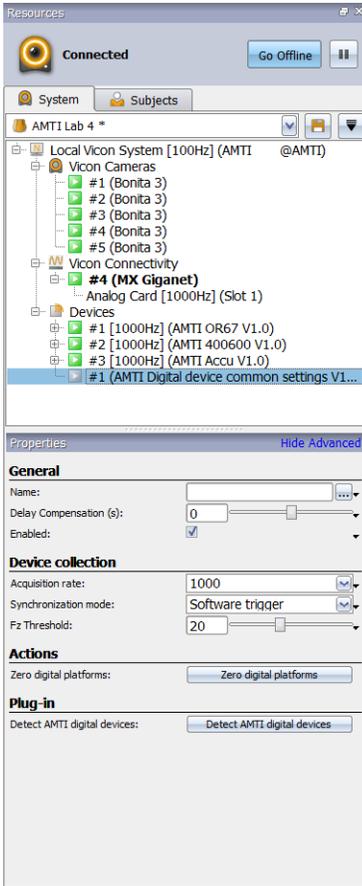


Figure 2- Digital Device Common settings

Once this is selected, you should have a new item below “Devices” (see Figure 2) with a grey box called “AMTI Digital device common settings”. It should also automatically detect all the AMTI digital devices that are connected and list them above “AMTI Digital device common settings” with green boxes.

Left click on “AMTI Digital device common settings” to see a number of settings appear in the “Properties” window pane below the “Resources” window. These settings will be applied to all AMTI digital platform that are connected and include:

- Delay compensation (in seconds)
- Acquisition rate in Hertz :
 - o Gen5 : Max is 2000Hz
 - o OPTIMA: Max is 1200Hz
 - o ACS-0/ACG-0: Max is 1000Hz
- Synchronization mode (see below)
- Fz threshold (in Newtons): data packets with less than this cutoff limit will appear as zeros.
- Zero digital platforms
- Detect AMTI digital devices: Re-initialize the dll and search for connected AMTI devices

By right clicking on “AMTI Digital device common settings” the options shown below will become available:

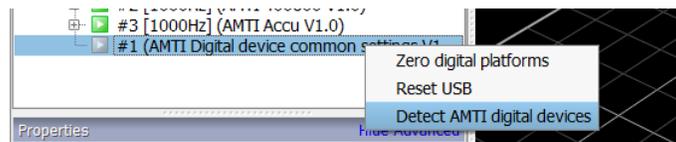


Figure 3- Digital Device Common options

These options allow you to zero all digital platforms, reset the USB interface, or detect AMTI digital devices connected.

Step 5: Select the Synchronization Mode

You have two options for the type of synchronizations. This should be set in the “Properties” window with “AMTI Digital device common settings” selected. Choose either “Software trigger” or “Hardware trigger” based on the descriptions below.

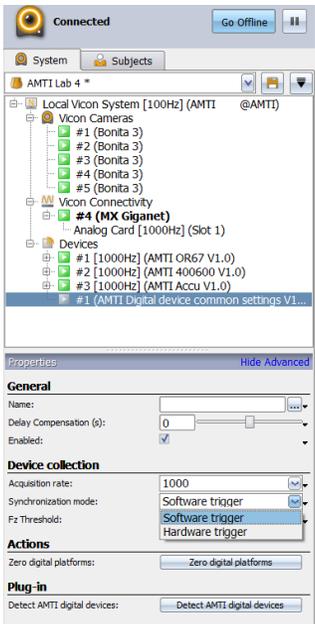


Figure 4- Synchronization mode

1. **Software trigger:** Nexus will digitally handle the synchronization between the MX data and the platform data. It may have subtle inaccuracies due to inherent time delays in sending startup messages to all devices.

2. **Hardware trigger:** This will usually perform best, but requires a Lock+ or Giganet. Connect a cable from one sync port on the Lock+ or Giganet to the “trigger” port on the back of one of the amplifiers. In the case of the AccuSway-O/ AccuGait-O this would connect to the port directly on the platform, however please refer to the *AMTI Nexus Plugin documentation* for the correct configuration with these plates. You then have to specify in the properties for each platform which sync input was used (see below).

Step 6: Set platform properties

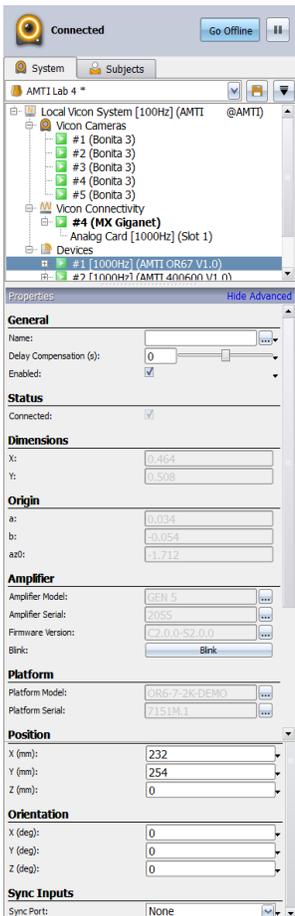


Figure 5- Digital platform properties

When you select a digital platform in the resources panel, you can change the platform properties (see figure 5) in the same way that you were able to for the common settings, and previously for analog force plates.

The information you must enter here is less complex than what would have previously been necessary when working with analog platforms. You do not have to enter the dimensions, the origin, or the platform model number since all of this is automatically loaded from an AMTI digital library. You will also notice that there is no gain, correction factor, or calibration matrix to enter since the data is already digitized and converted to forces and moments.

All you need to enter is the position and orientation of the plate in the 3D environment, and the sync inputs.

The “Sync Inputs” field is to be used if hardware trigger has been selected (see Step 5 above). Make sure the platform that is connected to the Lock+/Giganet is highlighted and set the “Sync Port” to the corresponding sync output port for the Lock/Giganet. Only one sync cable physically needs to be connected to one amplifier, and you only need to set the sync port for that amplifier in the device’s properties. For multiple AccuGait-O/AccuSway-O plates, a dummy grounding connector (provided by AMTI) should be connected to any plate that is not connected to the sync source, as described in section 4 of the *AMTI Nexus Plugin documentation*.

Step 7: Save the configuration

Once all parameters have been properly entered for your setup, save the configuration. The next time you open Nexus with this configuration, the AMTI force plates should be automatically detected and the last saved settings will be loaded.

Diagnosing and reporting problems

Issues with the AMTI plugin and its operation should be reported to AMTI. Specific sequences of events and error conditions are helpful in tracking down problems.

Some useful information can be found in the Nexus log files, which are stored for each session in the directory:

C:\ProgramData\Vicon\Nexus\Log

It may be useful to attach the log file from a problem test when reporting errors.

Contact AMTI at support@amtimail.com for any issues.