



Noraxon Plug-In for Vicon Setup

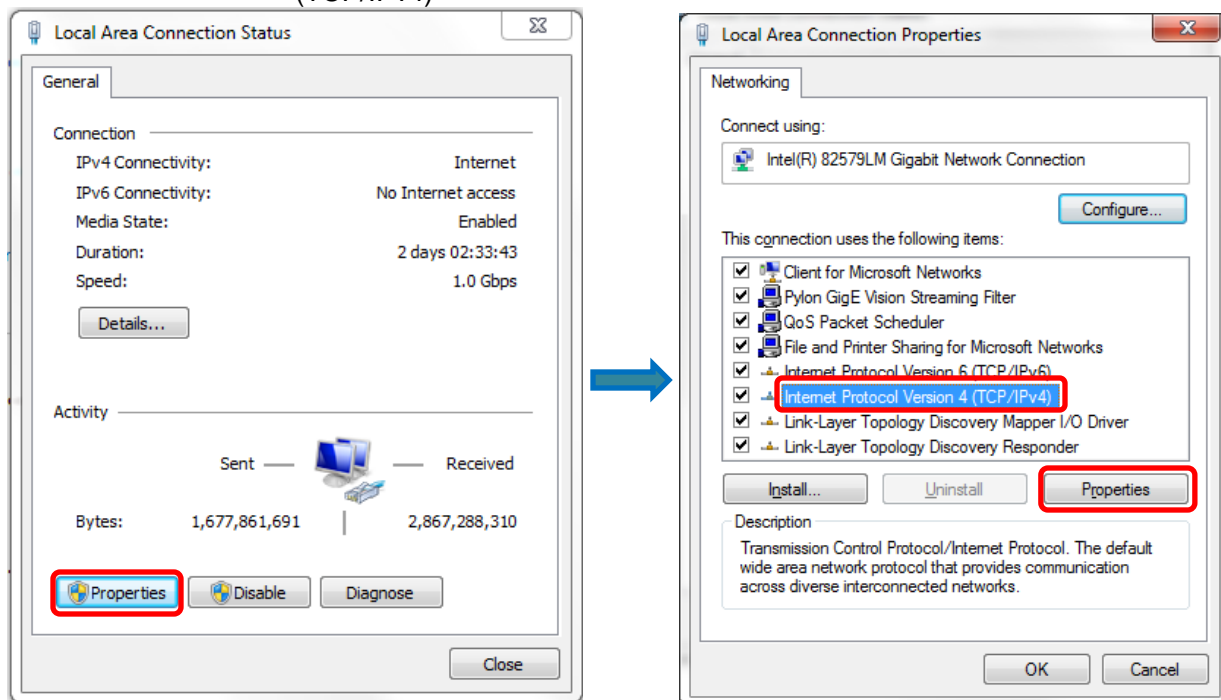
Often, Noraxon users wish to use their Noraxon EMG systems in conjunction with Vicon technology, the gold standard for motion capture technology. When used together, synchronization of the systems becomes imperative for accurate data collection and analysis. This guide will outline how to setup and synchronize a Noraxon EMG system with Vicon in the Vicon Nexus software using the Noraxon-Vicon Interface (plug-in).

Nexus Setup:

Please consult the Vicon manual for full software instructions or troubleshooting with the Vicon Nexus software.

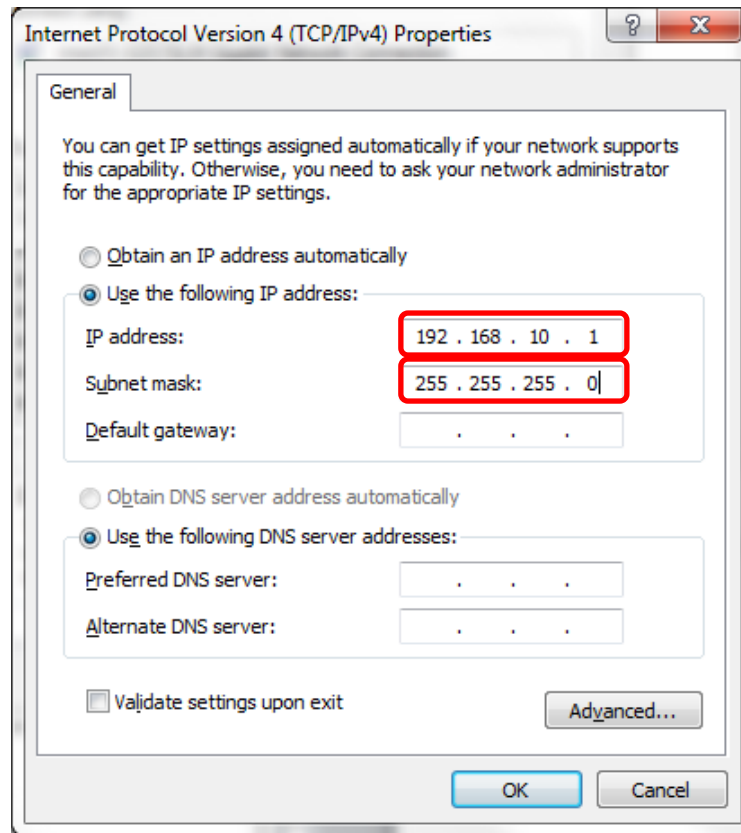
Note: This was tested with the latest Vicon equipment: MX Giganet. These results have not been confirmed with older Vicon equipment.

1. Install the Nexus software version 1.8.3 or later
2. Install Sentinel HASP/LDK Windows GUI Run-time installer (needed for the Vicon key to work):
<http://sentinelcustomer.safenet-inc.com/sentineldownloads/?s=&c=End+User&p=Sentinel+HASP+HL&o=all&t=all>
3. Configure network adapter
 - a. Use Control Panel\Network and Internet\Network Connections\Local Area Connection\Properties
 - i. In the Local Area Connection select Properties
 - ii. In the Local Area Connection Properties, select "Internet Protocol Version 4 (TCP/IPv4)"





- b. Edit internet protocol version 4 (TCP/IPv4) Properties
 - i. Choose “Use the following IP address:”
 - ii. Enter IP address: 192.168.10.1
 - iii. Click in the space for the Subnet mask, it should read 255.255.255.0



- c. Click OK to save these settings
4. Restart computer
5. Optional: ensure 192.168.10.1 network is working and no firewalls are blocking traffic (open the Nexus software and make sure Vicon is working properly)

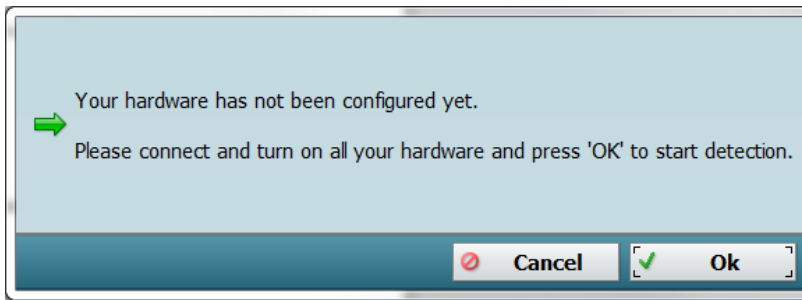
Noraxon Plug-In Setup (Noraxon.Aquire.Vicon)

1. Close Nexus if it is still running
2. Install Noraxon's interface for Vicon: ViconInterfaceForNoraxon.msi
 - a. Once the installer is run, the prompt window will appear, click “Next” to confirm and begin installation
 - b. The Noraxon plug-in will automatically search for the correct installation folder, but the user should verify the install directory is “...\Vicon\Nexus\DigitalDevices\”
 - c. Click “Install” to begin installation, installation will begin and the green progress bar will indicate progress...
 - d. Click “Finish” when installation is complete
3. Turn on the Noraxon EMG system to be used

Note: The Nexus plug-in supports only one Noraxon device at a time

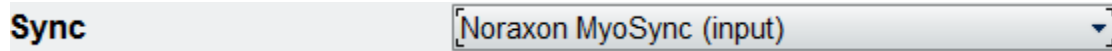


4. Open the Nexus software, the following box should appear

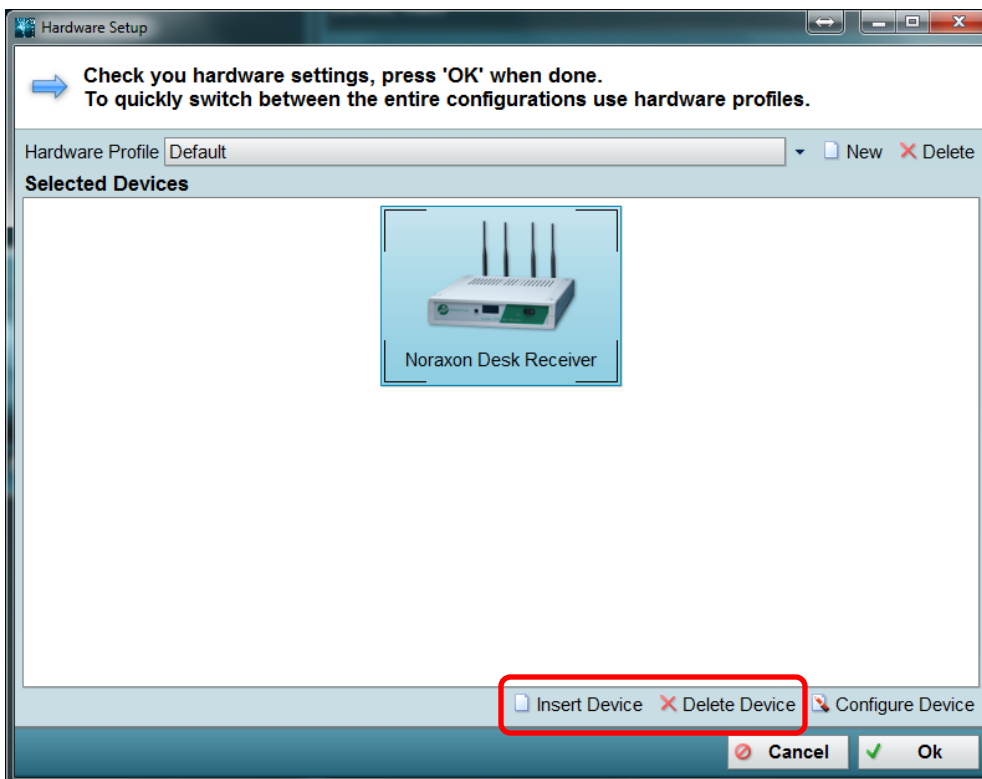


5. Click OK and follow the hardware setup instruction as given in the Noraxon system's hardware manual. The Noraxon system MUST be set to Sync In.

Note: This box will only appear when there are no Noraxon devices in the Hardware Setup.

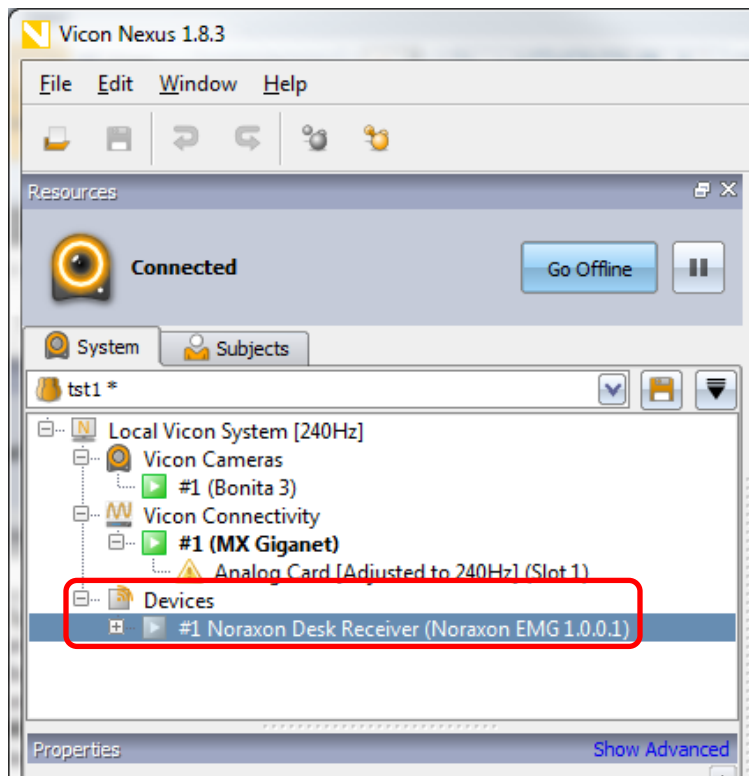


If a device has been inserted previously, the Hardware Setup box will automatically appear with that device inserted, even if that device is not currently connected to the PC. To insert a different device, select the device currently in the Hardware setup and click “Delete Device” then click on “Insert Device” and choose the appropriate device.



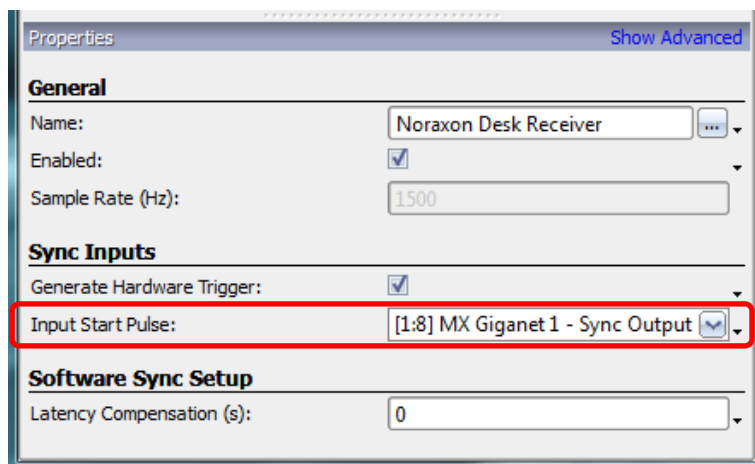


6. In the Nexus software, select the Noraxon device, it will appear under the System tab



The icon next to the Noraxon device indicates the status:

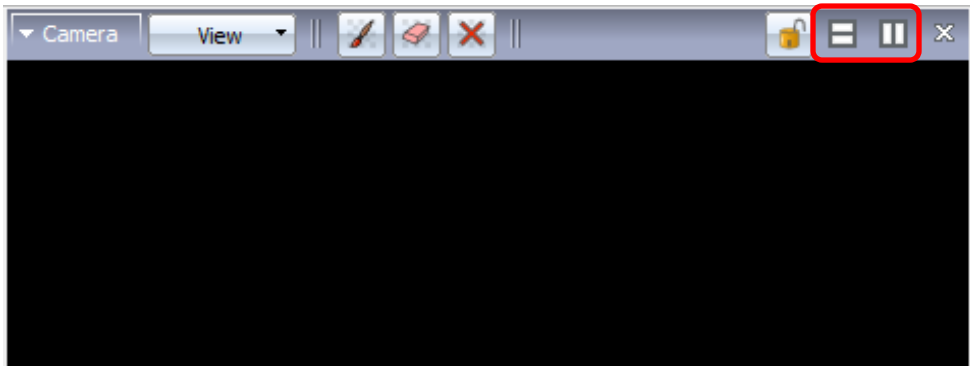
- Red X – not connected
 - Gray Arrow – connected, but not receiving data
 - Green Arrow – connected and receiving data
7. In the Properties select a GPO port for the Input Start Pulse. This GPO port is the sync out port being used to send a sync signal from the Vicon system to the Noraxon system, meaning the sync cable will run from this port to the sync in port of the Noraxon system. In the example below, sync out port 8 is selected.



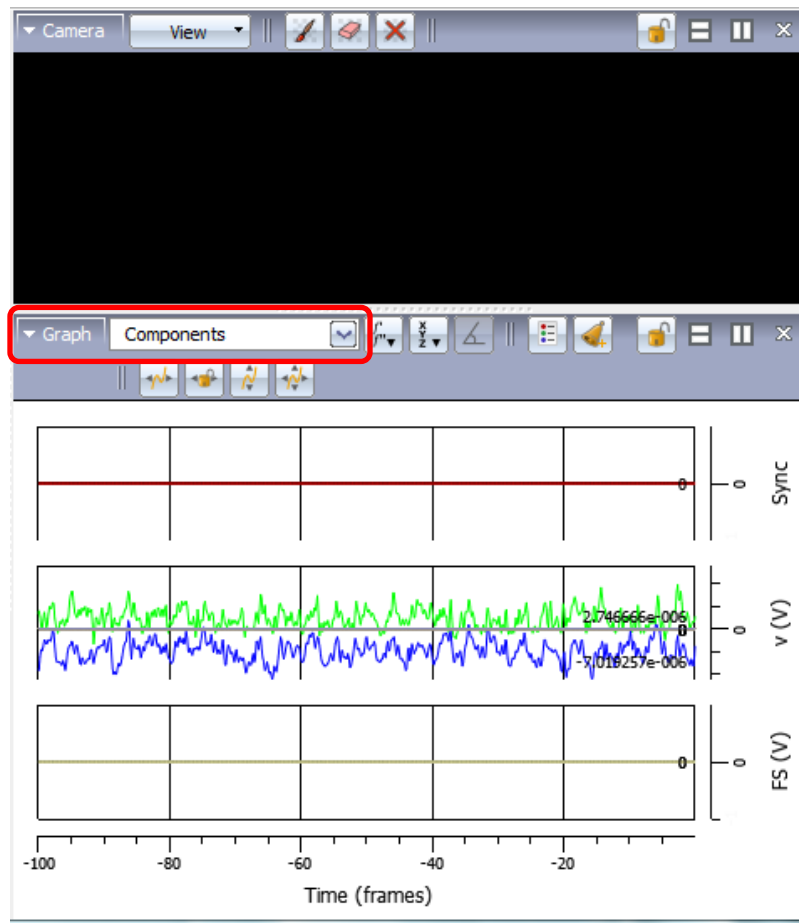


8. Wait for the MX Giganet to respond to the request to generate a sync pulse. When ready, the icon next to the Noraxon device will change to a green arrow.
9. The view in the software will automatically display the Vicon camera(s) view. To see the sync signal(s) and EMG signal(s) from the Noraxon device, it is necessary to add another window. Hit one of the window buttons in the upper right corner.

Note: the EMG signal is best seen if the two windows are horizontally parallel, but it is possible to also make them vertically parallel.



10. In the left hand corner of the window, select "Graph" and "Components" from the drop down menus.





Noraxon Properties Settings

1. Select the Noraxon Device
2. Under the Properties panel, click on “Show Advanced”
The properties should default to those seen below. If different, change to these settings

The screenshot shows the 'Properties' dialog box for a Noraxon device. It has a 'Hide Advanced' button in the top right corner. The dialog is divided into four sections:

- General:**
 - Name: Noraxon Desk Receiver (with a dropdown arrow)
 - Delay Compensation (s): 0 (with a slider bar)
 - Enabled: ☒
 - Sample Rate (Hz): 1500
- Status:**
 - Connected: ☒
- Sync Inputs:**
 - Generate Hardware Trigger: ☒
 - Input Start Pulse: [1:8] MX Giganet 1 - Sync Out (with a dropdown arrow)
- Software Sync Setup:**
 - Latency Compensation (s): 0
 - Drift Correction: None (with a dropdown arrow)

3. If not using hardware sync, configure the Software Sync options
 - a. Latency Compensation(s) – enter a value for the number of seconds to shift the signals
 - b. Drift Correction – Vicon options to correct for drift. Consult Vicon for more information

Hardware Requirements

The Vicon system must have sync out capabilities

The Noraxon EMG system must have sync in capabilities. These systems include:

TeleMyo DTS Desk Receiver
 TeleMyo DTS Belt Receiver*
 TeleMyo 2400T G2*

*The TeleMyo 2400t G2 and TeleMyo DTS Belt Receiver (if not hooked directly to the PC) require a wireless sync receiver (connected to the wireless system) as well as a receiver with a wireless sync antenna (2400 Mini Receiver or 2400R G2) connected to the PC. The sync cable from the Vicon system will then connect to the receiver that will send the sync signal wirelessly through the wireless sync antenna to the wireless sync receiver connected to the 2400T G2 or the Belt Receiver.

Sync cables with appropriate connectors are required. The sync connectors required will vary between different Vicon and Noraxon systems.



Optional Sync Verification

The synchronization between the Vicon video recording and the EMG signals can be verified using the Noraxon Sync Light.

Note: The sync light works with the Vicon Bonita, older versions may require a different LED that produces infrared in the spectrum the camera is capable of sensing.

The best way is to use one of the GPO ports on the MX Giganet to send a sync pulse to the Noraxon MyoSync which will then send a sync pulse to the Noraxon EMG device and the Noraxon Sync Light at the same time.

Since one of the GPO ports is being used to establish sync between the two systems, a separate GPO port will need to be used for the purpose of verifying sync. To do this create a .gpo script or use one that Noraxon can provide to generate known signals during the recording. The image below illustrates using a script named Noraxon_Test_SO99_STO0_PW1_PP100. The name indicates the settings, below is the actual script contents. This example tells the MX Giganet to send a pulse on the 99th frame after the recording starts and a pulse every 100th frame thereafter. When the cameras are set to record at 100 frames per second, this has the effect of sending a pulse every second starting one second from the beginning of the recording. Each pulse will last for one frame.

```
<?xml version="1.0" standalone="yes"?>
<AllPrograms>
  <Program Name="MXDVTrigger">
    <Type>Repeating</Type>
    <Polarity>High</Polarity>
    <StartEvent>StartCapture</StartEvent>
    <StopEvent>StopCapture</StopEvent>
    <StartOffset Frames="99.0"/>
    <StopOffset Frames="0.0"/>
    <PulseWidth Frames="1.0"/>
    <PulsePeriod Frames="100.0"/>
  </Program>
</AllPrograms>
```

Noraxon_Test_SO99_STO0_PW1_PP100.gpo

To appear as options for the Sync Out sockets, script files are placed in the Nexus GPO folder, for example in "C:\ProgramData\Vicon\Nexus\GPO".

Since we already have cabling from the sync GPO (GPO 8 in the previous illustration), separate cabling for test signal GPO port will be needed; as is a way to combine the two signals. Noraxon can provide an adapter cable to combine the two signals onto one cable.

Example Cabling:

```
Sync Output on GPO 8 --|                                     |-- EMG Device
                        |                                     |
                        |----- Adapter to combining signals ----- MyoSync --|
                        |                                     |
Sync Output on GPO 7 --|                                     |-- Sync Light
```

Once the software is configured and the cabling in place a recording can be made to verify sync. Review the recording to examine the alignment of the plus on the sync channel with the appearance of the sync light in the video.



System

Subjects

tst1 *

Local Vicon System [100Hz]

Vicon Cameras

#1 (Bonita 3)

Vicon Connectivity

#1 (MX Giganet)

Analog Card [Adjusted to 100Hz] (Slot 1)

Devices

#1 Noraxon Desk Receiver [1500Hz] (Noraxon EMG 1.0.0.1)

Properties

Hide Advanced

Identification

Name:

Type:

Device Id:

MX Giganet

34604009

Status

Enabled:

Sync Master:

☒

☒

Genlock

Enabled:

Standard:

Status:

☐

None

None

Timecode

Enabled:

Source:

Dropped Frames:

Standard:

Status:

☐

Internal

☐

PAL

Ready To Use

Sync Out

Socket 1:

Socket 2:

Socket 3:

Socket 4:

Socket 5:

Socket 6:

Socket 7:

Socket 8:

Noraxon_Test_SO99_STO0_PW1_PP100

MX Hardware

MAC Address:

IP Address:

00:00:37:10:03:e9

192.168.10.10