

# Analog Output Integration in Vicon

## (OPTIMA or GEN 5 users)

Note: Before beginning, complete the *Quick Start Guide (OPTIMA/Gen 5 users)*

### Configure the 'Fully Conditioned' analog mode in NetForce

- Double click NetForce to run.
- Select **'Setup'** then **'Hardware Installation'**, and click on **'Modify'** to open the **'AMTI System Configuration'** window.
- Under **'Global Settings'**, select **'English Units'** for the **'Digital Outputs'**, setting. You must use English units when integrating with Vicon.
- The **'Analog Outputs'** should be set to **'Fully Conditioned'**. If you are using an OPTIMA system, this is the only analog output option that will work. Press **'Apply'**.
- For the force plate and amplifier of interest, click on the button under **'Configure'** in the list of **'Installed Amplifiers'**. This will open the **'Amplifier Configuration SN:XXXX'** window (see image below).
- The gain and excitation should have been selected already, if not return to step 6 of the *Quick Start Guide (OPTIMA users)* or *(Gen 5 User)*, as appropriate.
- Once the Gain and Excitation has been set, click the **'Analog Adjust'** button (version 3.5.4 of NetForce or see note). This will set the **'Analog Scale Factor'** such that the **'Analog Outputs'** for each channel match the **'Amplifier Range'** (see image below). This ensures that the +/- 5V output of the amplifier corresponds to the working range of the system (defined by the gain settings).

**NOTE:** If your version of NetForce does not have an **'Analog Adjust'** button simply enter in values for the **'Analog Sensitivities'** and press apply. Adjust these values until the **'Analog Outputs'** are similar to the **'Amplifier Range'**

- Record the values for the **'Analog Scale Factor'**/**'Analog Sensitivities'** for each channel.

The image shows two overlapping software windows. The background window is 'AMTI System Configuration' with the following settings:

- Global Settings: Acquisition Rate: 1000 datasets/sec, Digital Outputs: English Units, Analog Outputs: Fully Conditioned
- Installed Amplifier table:
 

Index	Model #	Serial #	Configure	Blink
1	HPS-SC	2186	[Red Box]	[ ]

The foreground window is 'Amplifier Configuration SN: 2186' with the following data:

Configuration Information

	Fx lbs	Fy lbs	Fz lbs	Mx in-lbs	My in-lbs	Mz in-lbs	
Platform Capacity	1000.00	1000.00	2000.00	23600.00	15800.00	11800.00	
Amplifier Range	160.11	162.31	1293.76	6489.28	5167.14	2699.06	Max
	-160.11	-162.31	-1293.76	-6489.28	-5167.14	-2699.06	Min
Analog Outputs	161.29	161.29	1282.05	6493.51	5154.64	2702.70	Max
	-161.29	-161.29	-1282.05	-6493.51	-5154.64	-2702.70	Min

Current Configuration

Cable length: 30.00 Feet

	Fx	Fy	Fz	Mx	My	Mz	
Excitation	10.0	10.0	10.0	10.0	10.0	10.0	Volts
Gain	2000	2000	1000	1000	1000	1000	Percent
Zero Setpoint	0	0	0	0	0	0	Percent
Analog Scale Factor	31	31	3.9	0.77	0.97	1.85	Conditioned

The 'Analog Adjust' button is highlighted in red.

## Integrate the force plate into Vicon

- Make sure the amplifier and A/D hardware is connected to the motion capture system as indicated in the Vicon Giganet or Lock+ manual, as appropriate.
- In Vicon Nexus, make sure you are in **'Live'** mode, then right click on **'Devices'**, however over **'Add Analog Device'**, then select **'Add AMTI OR6 Series Force Plate'**
- When the force plate is selected you should see a 'Properties' section at the bottom of the system resources pane. Make sure you have clicked **'Show Advanced'**.
- Ensure that the **'Calibration File'** dropdown is empty, or select it and set it to **'None'**
- For the **'Calibration Matrix'** setting click on **'...'**, which will open a 6 by 6 matrix of zeroes. Leave the rest as zeroes, but replace the diagonal elements with the values you recoded above for the **'Analog Scale Factor'/'Analog Sensitivities'**. See image below.

Amplifier Configuration window from NetForce

	Fx lbs	Fy lbs	Fz lbs	Mx in-lbs	My in-lbs	Mz in-lbs
Platform Capacity	1000.00	1000.00	2000.00	23600.00	15800.00	11800.00
Amplifier Range	160.11	162.31	1293.76	6489.28	5167.14	2699.06
	-160.11	-162.31	-1293.76	-6489.28	-5167.14	-2699.06
Analog Outputs	161.29	161.29	1282.05	6493.51	5154.64	2702.70
	-161.29	-161.29	-1282.05	-6493.51	-5154.64	-2702.70

Right click on devices to add the platform

Correction Factor: 1000

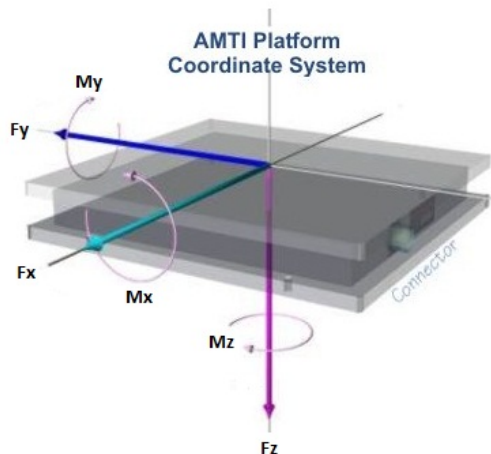
Calibration Matrix

	1	2	3	4	5	6
1	31.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
2	0.00000000	31.00000000	0.00000000	0.00000000	0.00000000	0.00000000
3	0.00000000	0.00000000	3.90000000	0.00000000	0.00000000	0.00000000
4	0.00000000	0.00000000	0.00000000	0.77000000	0.00000000	0.00000000
5	0.00000000	0.00000000	0.00000000	0.00000000	0.97000000	0.00000000
6	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	1.85000000

- Set the correction factor to 1000.
- In the **'Source'** menu, select the correct source. This is the Lock+ or Giganet to which the AMTI force plate is connected.
- For each channel of the force plate set the pin assignment based on how it is connected to the A/D board.

- i. Enter the '**Dimensions**' of the platform in mm for X and Y
- j. Enter the '**Position**' of the platform (center of the top surface) in mm for X and Y and Z.
- k. Enter the '**Orientation**' of the platform within the Lab coordinate system. Please see below for the force plate's coordinate system.
- l. In the '**Origin**' menu enter the electrical origin offsets
  - i. For an OPTIMA force plate these will be 0,0,0
  - ii. For a force plate with a Gen 5 you can find these values as part of your force plate's calibration information.

Properties		Hide Advanced
Mz:	Pin 6	
<b>Dimensions</b>		
X (mm):	400	
Y (mm):	600	
<b>Position</b>		
X (mm):	0	
Y (mm):	0	
Z (mm):	0	
<b>Orientation</b>		
X (deg):	0	
Y (deg):	0	
Z (deg):	0	
<b>Origin</b>		
X (mm):	0	
Y (mm):	0	
Z (mm):	0	



- m. Verify that the forces are correct by displaying a graph of the forces in real-time in Nexus.
- n. You have completed the Fully Conditioned analog integration into Vicon Nexus.