# *The MotionMonitor xGen Hardware Guide:*
AMTI Gen5 Analog Configuration

This document reviews the procedures for configuring the AMTI Gen5 device in The MotionMonitor xGen software with analog outputs.

System overview showing major components

Gen5 Amplifier
(Signal Conditioner)

AMTI
Forceplate

Gen5 Power
Cable

Gen5 Analog (BNC)
Output Cable

Forceplate Output
Cable to Gen5
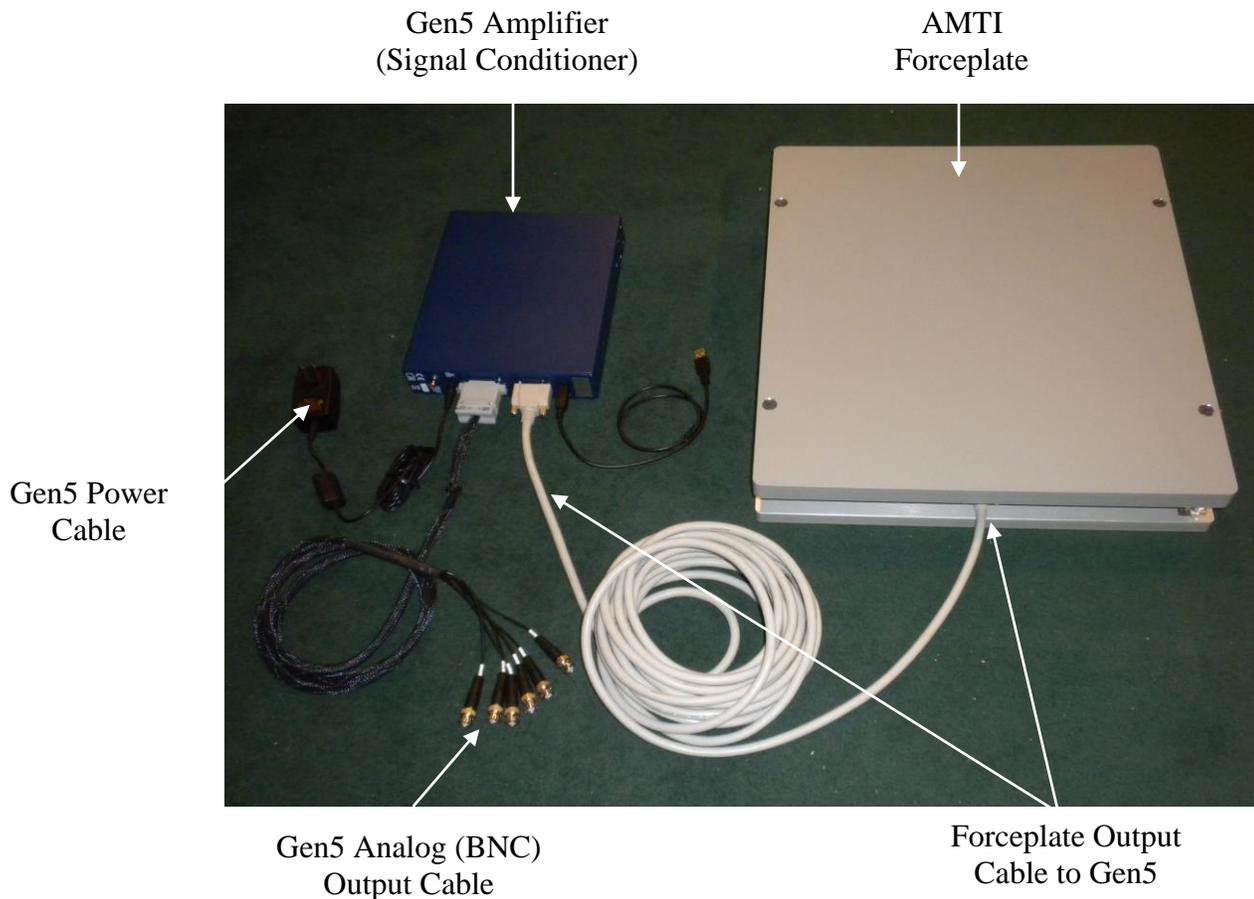
1. Place the force plate on a flat surface.

2. All connections should be made as shown below. Identify the 26-pin D Sub female connector on the force plate output cable. Match this end of the cable with the male 26-pin D Sub connector on the force plate. Connect the cable and tighten the two screws on the D Sub connector. Note that some older force plates require a specific conversation cable in order to connect the force plate to this output cable.

3. Connect the other end of the force plate output cable to the back of the Gen5 Amplifier connection labeled "Transducer Input" and tighten the connectors.
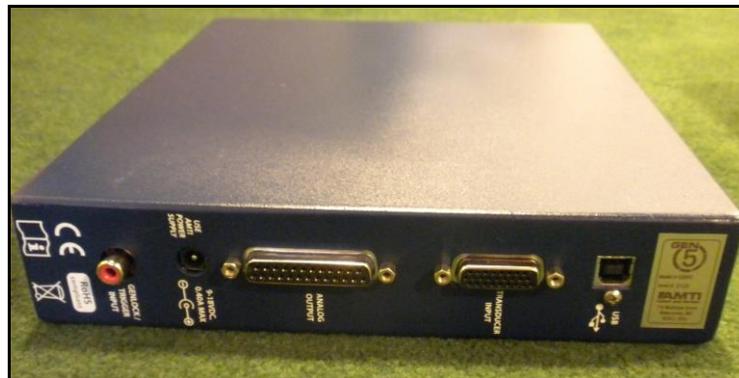
4. Install the Gen5 software and drivers on your computer using the Gen5 installation CD. Contact your Client Support Engineer if you require assistance obtaining these materials.

5. Connect and plug in the power supply to the Gen5 Amplifier. Connect the USB cable from the back of the Gen5 Amplifier to the computer. Toggle the power switch on the front of the Gen5 Amplifier to turn it on. The LED on the power switch should turn on when the power is in the on position.

6. Launch the AMTI System Configuration software from the desktop shortcut.

7. From the Global Settings section of the AMTI System Configuration dialog, select MSA 6 Compatible from the Analog Outputs drop down menu.
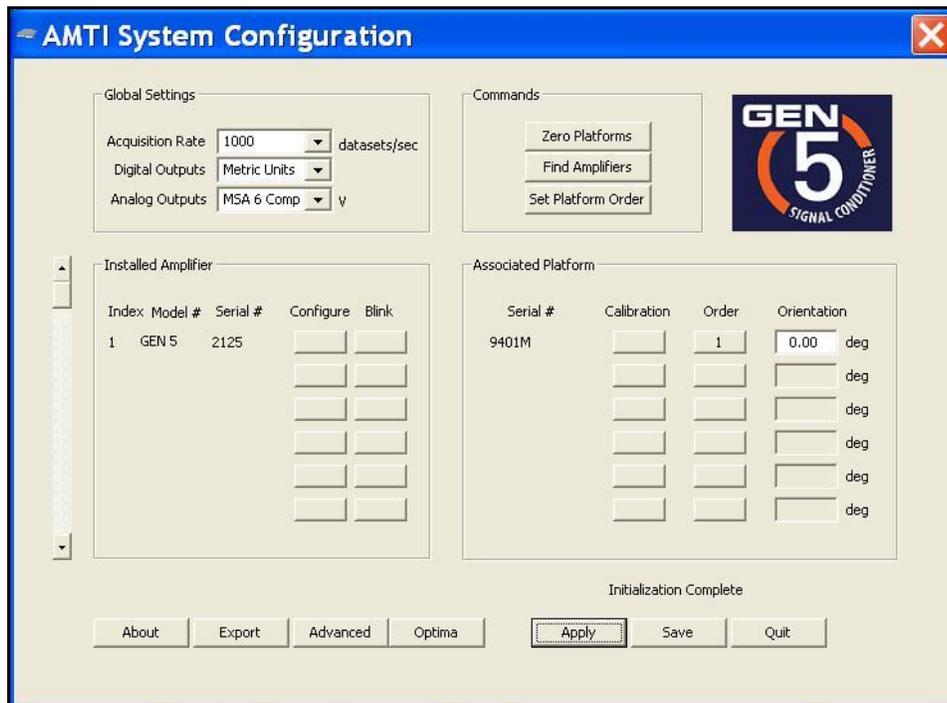
Note: If the force plate is an AMTI Smart Platform the correct calibration settings are automatically loaded into the Gen5 when it is powered on. If the platform is not an AMTI Smart Platform the calibration file will have to be manually uploaded to the Gen5 through the Calibration button in the Associated Platform section of the AMTI System Configuration dialog.

8. From the Installed Amplifier section of the AMTI System Configuration dialog, click on the configure button for each connected amplifier. Select the desired values for the Excitation voltage and Gain settings. Click Apply and then OK.

9. From the main window of the AMTI System Configuration dialog, click Apply and then Save. You can now quit out of the application. These settings will be saved to the flash memory for the Gen5 Amplifier and should not need to be reconfigured unless any of these settings need to be changed or if hardware modifications are made. Additionally, since analog forceplate data are being output through the Gen5 amplifier, the USB cable can be disconnected at this point.

10. Connect all 6 analog BNC output cables to the BNC A/D device connected to The MotionMonitor computer.

11. With no load on the force plate, push the "Auto-zero" button on the front of the Gen5 Amplifier. The LED on the Auto-zero button should blink.

12. Start The MotionMonitor xGen and go to the Setup Components Window.

13. From the Hardware node in the Setup Components window add the AMTI plate through the Add button at the bottom of the Components window or right-click on the Hardware node to add the device.
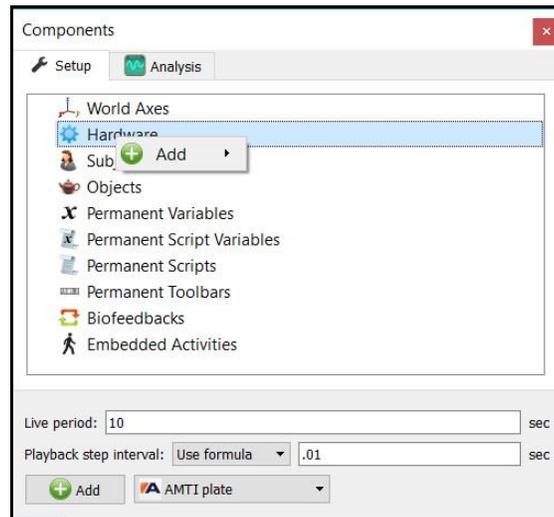
14. From the AMTI plate parameters panel, specify the name for your force plate and the Z0 height from the AMTI calibration sheet. The min/max x and y coordinates refers to the dimensions for the plate, relative to its origin. This will control the footprint for the force plate in the animation window. The settings displayed in the image below would be for a 50cm x 50cm force plate. The "Threshold force" sets the minimal allowable force to be used in the software for computing force derived and Center of Pressure data. The "Colocation method" can be selected as either "Digitize with Stylus" or "Use Expressions". The preferred and recommended method for alignment is the "digitize with Stylus" option. This method requires that a stylus be configured using a kinematic tracking system. Select the stylus from the "Stylus to use" drop-list and specify the number of points to use in the colocation points. After the remaining steps have been completed the "Calibrate" button performs a software zero of the force plate channels and the "Align" button will begin the procedure for aligning the force plate to the world axes. If an alignment is not performed, the force plate will report relative to it's native coordinate system.
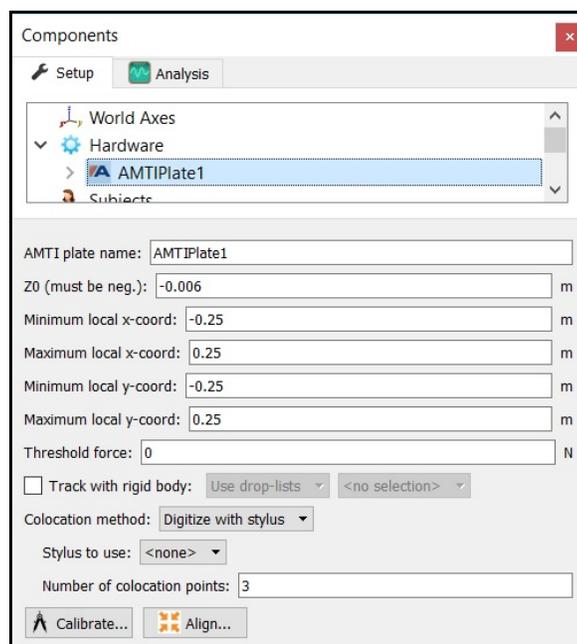
15. Expanding the AMTI plate node will bring up the 6 channels that need to be configured (Channels 0,1,2,3,4,5, which typically map to Fx, Fy, Fz, Mx, My, Mz, respectively). The "Output voltage" should be configured to specify where the channel is getting its signal from (i.e Measurement Computing Device or other data acquisition device). The "Unlaiden output voltage" will be automatically updated when the "Calibrate" button is pressed for the force plate. Enter the "Excitation Voltage" and "Gain" values that were set in the Amplifier Configuration section of the AMTI System Configuration application. Insert the values from the calibration sheet provided by AMTI from the SI Units Sensitivity Matrix S(i,j) for Output of Channel i times the mechanical input j. When entering this the rows from the matrix should be switched to columns. So, the first row in the calibration sheet will actually be the first column and would be entered below for Channel 0.
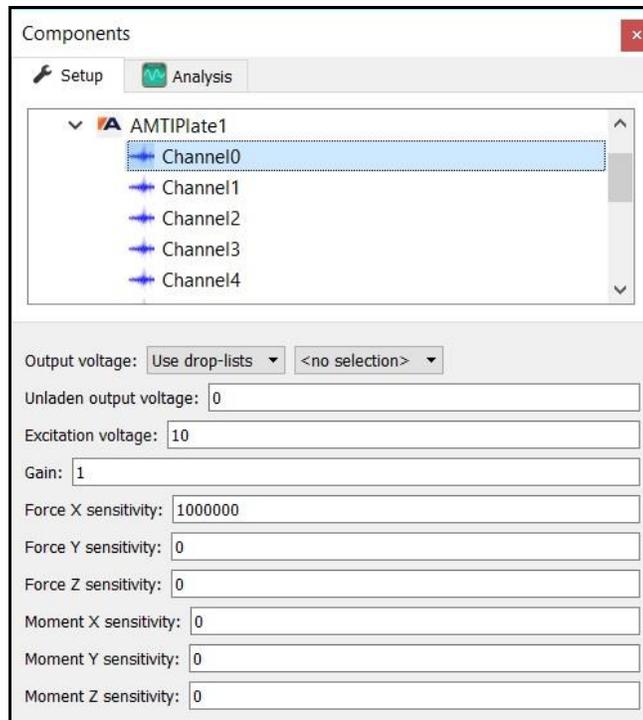

16. From the AMTI plate parameters panel click the "Calibrate" button to perform a software zero and click on the "Align" button to begin the procedure for aligning the force plate to the world axes.

    Be sure to press the hardware zero button before taking any of the colocation points. The colocation points should not be taken in the corners of the force plate, near a load cell or along the midline of two adjacent load cells. A steady strong force should be applied perpendicular to the surface of the force plate using the specified stylus. Stylus tip and CoP position data will then be used from each of the digitized readings to align the coordinate system of the force plate with that of the world. A tutorial video for configuring force plates can be found at https://www.innsport.com/supportxgen.html. This process needs to be performed for each force plate.

17. If a stylus is not already defined in the current Workspace, go to the Hardware node in the Setup Components window add the Stylus device through Add button at the bottom of the Components window or right-click on the Hardware node to add the device.
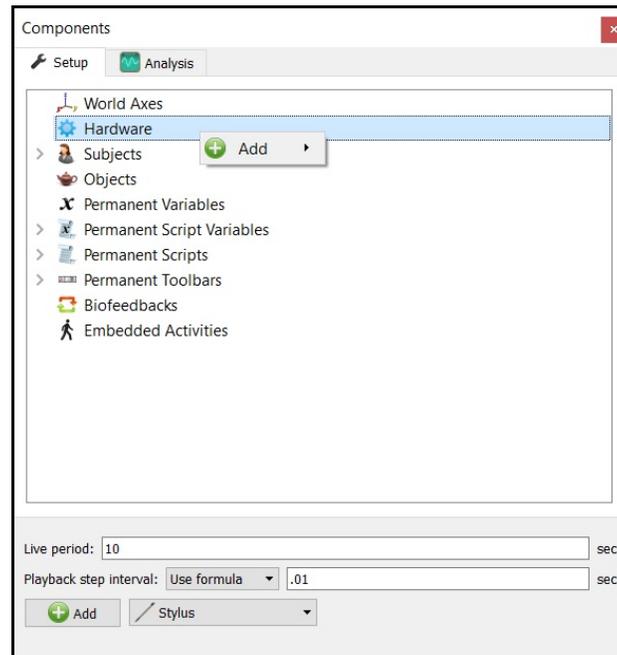

18. Before calibration of the stylus can be performed, the rigid body affixed to the object being used as the stylus needs to be selected through the "Rigid body" drop-list menu. If a remote OK button is to be used during the digitizing process, that Boolean expression would need to be defined through the "Is-button-pressed expression" drop-list menu or formula field. If the origin for the rigid body is at the tip of the stylus, as can be the case for certain kinematic tracking systems, the "Rigid body is at stylus tip" check box should be enabled.
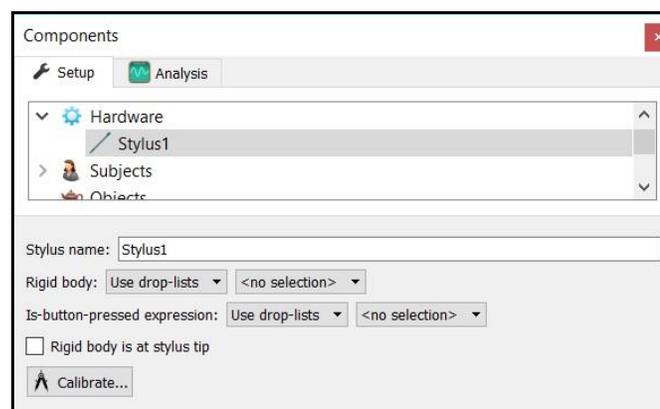
Once all parameter fields are completed, click the "Calibrate" button and follow the prompts to calibrate your stylus. A tutorial video for configuring the stylus can be found at https://www.innsport.com/supportxgen.html.

19. Once the Calibration and Alignment procedures have been completed, the force plate footprint and force vector should appear in the Animation window.
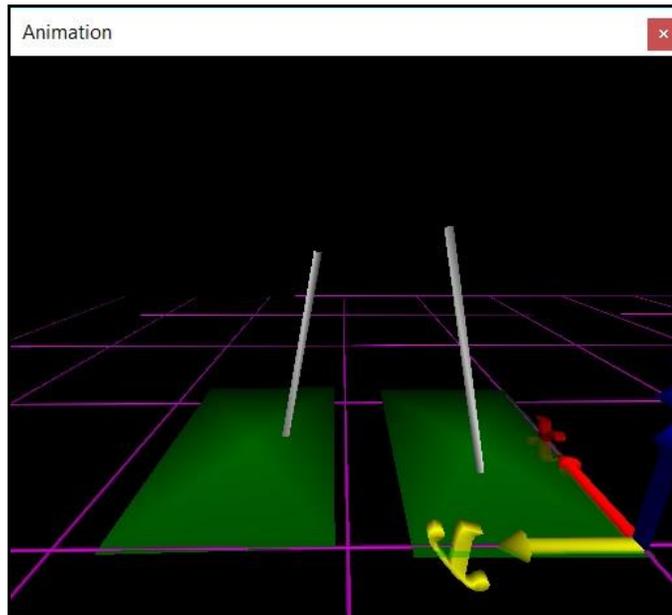
20. Force plate data can be defined as Analysis Variables and plotted in Graphs as seen in the image below. Tutorial videos for adding variables and graphs can be found at https://www.innsport.com/supportxgen.html.