

TSD109C TRI AXIAL ACCELEROMETER



The TSD109C Tri-Axial Accelerometer is a high level output transducer with an amplifier built into the transducer, so no additional amplification is required. It connects directly to the **HLT100C** High Level Transducer module to provide three outputs, which measure acceleration in the X, Y, and Z direction simultaneously.

- ❖ The **TSD109C** (5g) is well suited for measuring slow movements

With the proper equipment and proper scaling parameters listed below, precise acceleration measurements can be obtained.

Equipment

- MP Starter System
- HLT100C High Level Transducer Module
- TSD109C Tri-Axial Accelerometer- Output +/- 5G (400 mV/G)

Hardware Setup

Connect the HLT100C to the UIM100C Universal Interface Module. The TSD109C has 3 output connectors, 1 each for the X, Y, and Z axes. Each output connector must be connected to the appropriate HLT100C input channel. For example the X-axis to channel 1, the Y-axis to channel 2, and the Z-axis to channel 3.

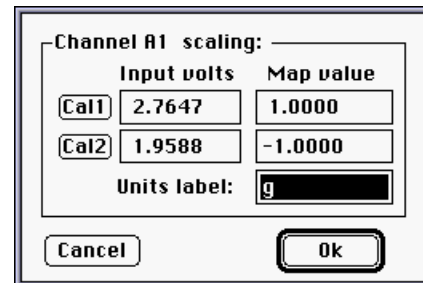
IMPORTANT

Make sure that the chosen channel is **not** already assigned to any other BIOPAC module; up to 5 Accelerometers can be used with a single MP System. **If contention exists, the channel data will be corrupted.**

TSD109C Calibration

Software Setup

1. Select **Setup Channels** under the MP menu and enable 3 analog channels, one for each axis. 2. Select **Scaling** (MPWSW) to generate the Scaling dialog.
3. In the **Map value** column, enter the scaling factors required, 1 and -
4. Enter “g” for the **Units label**, as shown.
5. Take the TSD109 and rest it in the upright position on the tabletop.
6. Calibrate the device by rotating it through 180 degrees and taking a calibration reading at each point.



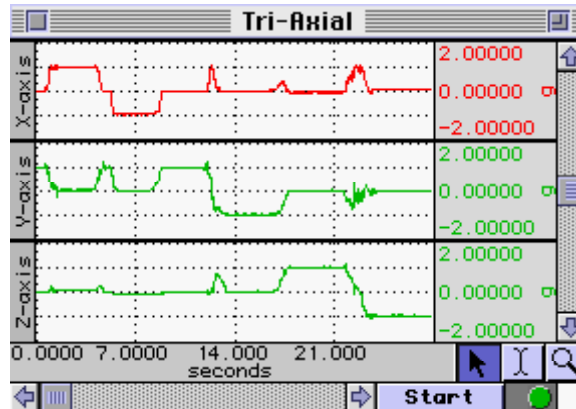
1.

To calibrate the Y-axis, set the transducer face up on a flat surface (such as a table) and click CAL1. Rotate the transducer 180 degrees, so that it is upside down, and click the CAL2 button. This procedure must be followed for each axis. A label on the front of the transducer displays the X and Y axes. The Z-axis rotates from the end with the label and the end with the cable.

Testing Calibration

1. Start acquisition (for the test procedure, a sample rate of 50 samples per second should be used)
2. Rotate the TSD109C 180° through each axis while continuing to acquire data.
3. Set the vertical scale to 1 and the midpoint to 0 for all channels.
4. Repeat the calibration procedure (by rotating the transducer 180°) through each axis.
5. Visually confirm the correct calibration.

This screenshot shows a TSD109C being rotated through each axis. Channel 1 (X-axis) shows the signal moving from 1g to -1g as the transducer is rotated. Likewise, Channel 2 (Y-axis) shows the same phenomenon as previously described. Finally, Channel 3 (Z-axis) has also been tested and the calibration confirmed.



TSD109C Specifications

Channels:	3 – (X, Y, Z axis)
Range (Output):	±5G (400 mV/G)
Noise:	325 µG/√Hz rms
Bandwidth:	DC – 500 Hz (-3dB)
Nonlinearity:	0.2% of Full Scale
Transverse Axis Sensitivity:	±2%
Alignment Error:	±1°
Package:	Compliant silicone housing
Power:	+5V @ 9mA (via HLT100C)
Sterilizable:	Yes (contact BIOPAC for details)
Cable Length:	3 meters
Weight:	17 grams
Dimensions:	33 mm long, 28 mm wide (at base), 19 mm high
Interface:	HLT100C
TEL100C Compatibility:	SS26 (5G) and SS27 (50G)

Discontinued Product: TSD109C was discontinued in 2013.