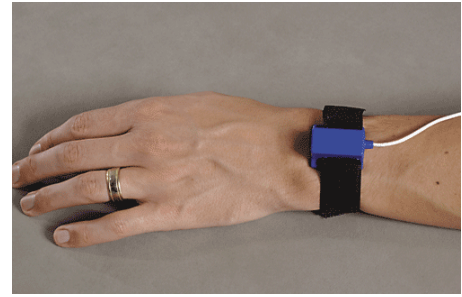## SS26LA-SS27L Tri-Axial   Accelerometers

The Tri-Axial Accelerometers connect directly to the MP3X and require no additional amplification. They provide three outputs, each simultaneously measuring accelerations in the X, Y, and Z directions. They are the same size and can be used on any part of the body or on external equipment. The pliable and unobtrusive design conforms readily to body contours. They come with a Velcro® strap for easy attachment.

Tri-axial accelerometer
uses 3 channel inputs

- The **SS26LA** is optimal for measuring accelerations when performing slow movements, such as walking.

- The **SS27L** is optimal for measuring quick movements, such as swinging a tennis racket.

The accelerometers have a frequency response that extends from DC to 500 Hz. It is extremely accurate and can be easily checked for calibration by simply changing its orientation in three-dimensional space, so that gravity (G=1) acts only upon the desired axis. One input channel is required for each output. Accordingly, you will require three input channels to measure each axis simultaneously.

ACCELEROMETER SPECIFICATIONS

|		
Range (Output):	SS26LA:	±5G (400 mV/G; 1 mV/G; 0 G is at 5 mV DC)
	SS27L:	±50G (40 mV/G; 100 mV/G; 0 G is at 5 mV DC)
Noise:	SS26LA:	0.5 mG/SQRT(Hz rms)
	SS27L:	6.6 mG/SQRT(Hz rms)
Bandwidth:		DC - 500 Hz (-3dB)
Nonlinearity:		0.2% of Full Scale
Transverse axis sensitivity:		±2%
Alignment error:		±1°
Package:		Compliant silicone housing
Dimension:		33mm (long) x 28mm (wide, at base) x 19mm (high)
Weight:		17 grams
Power:		+5V @ 25 mA (via TEL100)
Sterilizable:		Yes (contact BIOPAC for details)
Cable Length:		3 meters
Interface:		MP3X Acquisition Unit

HARDWARE SETUP

The **SS26LA** and the **SS27L** have three output connectors, one each for the X, Y, and Z axes. Each output connector must be connected to an **MP3X** input channel. For example the X-axis to channel 1, the Y-axis to channel 2, and the Z-axis to channel 3.

SOFTWARE SETUP

Select **Setup Channels** under the **MP3X** menu and enable three analog channels, one for each axis, with the appropriate **Accelerometer Preset** (5g or 50g).

a) Click on **View/Change Parameters** and then click on **Scaling**:

b) In the **Scale value** column, enter the scaling factors required, 1 for Cal1 and –1 for Cal2.

c) Enter "g" for the **Units label,** as shown.

d) Take the SS26LA/SS27L and rest it in the upright position on the tabletop.

e) Calibrate the device by rotating it through 180° and taking a calibration reading at each point.

f) To calibrate the Y-axis, start with the transducer sitting on the table, face up, and click CAL1. Rotate the transducer 180°, so that it is now sitting 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.
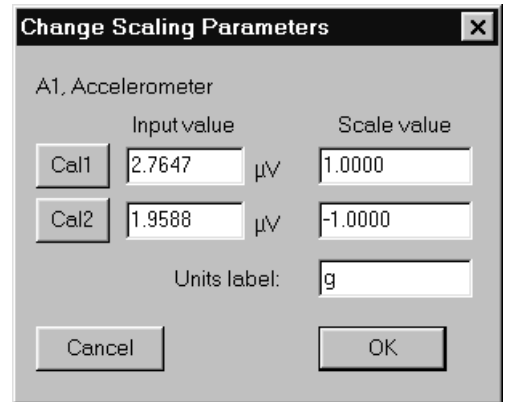
TESTING CALIBRATION

To see if the calibration is correct:

a) Start acquiring data (for the test procedure, you should use a sample rate of 50 samples per second)

b) Rotate the SS26LA/SS27L 180° through each axis.

c) Set the vertical scale to 1 and the midpoint to 0 for all channels.

d) Repeat the calibration procedure (by rotating the transducer 180°) through each axis.

e) Visually confirm the correct calibration.
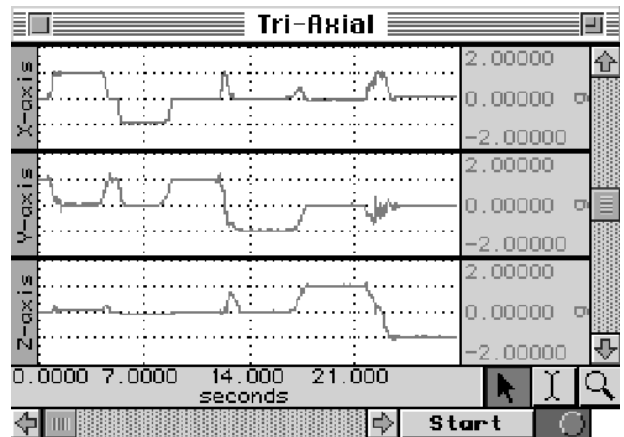
The screen shot above shows a tri-axial accelerometer being rotated through each axis. Channel 1 (X-axis) shows the signal moving from 1g to -1g as the transducer is rotated. Likewise, Channel 2 (Y-axis) shows the same phenomenon as previously described. Finally, Channel 3 (Z-axis) has also been tested and the calibration confirmed.