

TSD121C

Hand Dynamometer



The multi-purpose hand dynamometer adds a new dimension to force measurements. This fully isometric transducer can be used in the traditional hand grip strength fashion, pulled apart by both hands (the Dynagrips option), or mounted against a wall and pulled. The hand dynamometer can be used in isolation, or combined with EMG recordings for in-depth studies of muscular activity. The isometric design improves experiment repeatability and accuracy. The hand dynamometer is designed to interface with the DA100C General Purpose Transducer Amplifier, and the TEL100C remote monitoring module. The hand dynamometer transducer is the same for each system, but they each use a different connector and a different part number. The equipment section provides you with a list of the appropriate part numbers and interfaces.

TSD121C Calibration

With the proper equipment and correct scaling techniques described below, precise force measurements can be obtained.

Equipment

TSD121C Hand Dynamometer

MP System and DA100C General Purpose Transduce Amplifier

SS25 Smart Sensor Hand Dynamometer

MP System and TEL100C Remote Monitoring Module Set

Hardware Setup

Connect the TSD121C to the DA100C, or the SS25 to the TEL100C. When using this type of transducer, proper hand placement is at the uppermost portion of the foam grip, directly below the dynagrip connections.

Software Setup

1. Select **Setup Channels** under the MP menu and enable one analog channel; make sure to correlate this with the Analog Output Channel you selected on the DA100C module.
2. Select **Scaling**. A dialog similar to the one shown here will be generated.
3. In the **Map value** column, enter the scaling factors of 0 and 1, respectively. These represent 0 and 1 kilograms.
4. Enter "Kg" for the **Units label**, as shown.
5. Take the TSD121C and rest it on the table.
6. Click on the **Cal 1** button with the mouse to get a calibration reading.

Channel A1 scaling:		
	Input volts	Map value
Cal1	0.7556	0.0000
Cal2	0.7819	1.0000
Units label:		Kg

Cancel Ok

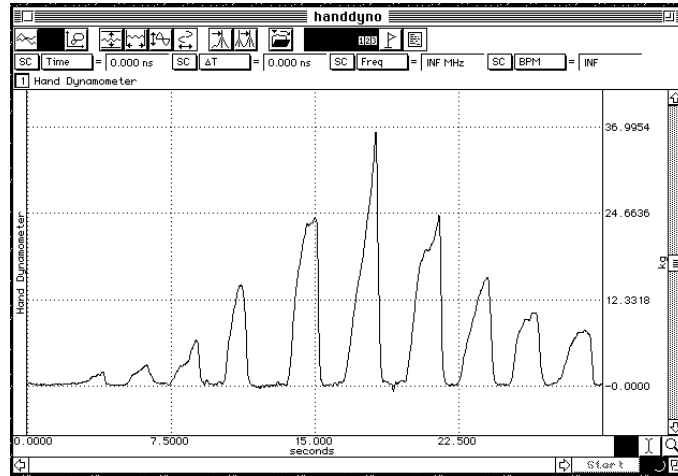
To obtain a value for the **Cal 2** box, add 13.15µV per volt of excitation to the value from the Cal 1 box. Currently, the DA100C is factory set to 2V (±1V) of excitation. If you have set your amplifier to another level of excitation, use the following equation wherein V = volts of excitation per 1 kg and G = gain setting on the DA100C or TEL100C module:

$$(13.15\mu\text{V} * G * V) + \text{Cal 1} = \text{Cal 2}$$

Testing Calibration

To see if the calibration is correct for the MP System:

1. Start acquiring data.
2. Place the hand dynamometer on a flat surface.
3. Place a known weight on the uppermost portion of the grip.
4. Check the data — the weight should be reflected accurately in the data acquired.



Sample Data

Also see DA100C Calibration options on page 38.

TSD121C Specifications

Isometric Range:	0-100 Kg
Nominal Output:	13.2 µV/kg (normalized to 1V excitation)
Weight:	315 grams
Dimensions:	185mm (long) x 42mm (wide) x 30mm (thick)
Cable Length:	3 meters
Interface:	DA100C—see page 36
TEL100C compatibility:	SS25—see page 179