



*FORCETRAC T7640*

*Measure More*  
*Sense Better*

# Technical Note Series

FORCETRAC (T7640)

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## IMPORTANT OPERATION INFORMATION

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- Type BF Equipment
- Internally powered equipment
- Continuous operation



### WARNING

- Explosion Hazard; Do not use in the presence of a flammable anesthetic mixture with air, or with Oxygen or Nitrous Oxide.
- Not to be immersed in water.



### CAUTION

- Connection of customer supplied circuits to Thought Technology sensor products has the potential to damage the sensor. Such damage is not covered by warranty.



### ATTENTION

- For research only. Not for use in diagnostic procedures.
- To prevent voiding warranty by breaking connector pins, carefully align white guiding dot on sensor plug with slot on sensor input.

### MAINTENANCE AND CALIBRATION

- Wipe with a clean cloth
- Factory testing and calibration ensure equipment accuracy and frequency response.
- No preventative inspections required;

### STORAGE

- Temperature -23C – +60C
- Humidity (non-condensing) 10% – 90%
- Atmospheric pressure 700 – 1060 KPa

### TRANSPORTATION

- Temperature -23C – +60C
- Humidity (non-condensing) 10% – 90%
- Atmospheric pressure 700 – 1060 KPa

## PRODUCT OVERVIEW



**ForceTrac with curved probe**

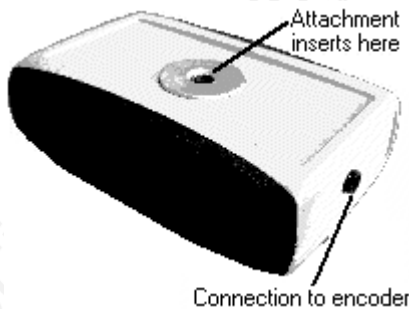
ForceTrac is a highly sensitive and accurate sensor capable of monitoring any force perpendicular to its surface through one of 3 attachments.

The ForceTrac force transducer can read a force (compression only) within a range of 0-100 lbs.

With the rod attachment, ForceTrac is used to apply force to a localized point (algometer) or as a manual muscle tester. It measures the amount of force applied and sends the value to the encoder.



**ForceTrac with rod attachment**



The ForceTrac comes with three attachments: rod attachment, flat and curved probes for manual muscle testing.

For instance, the examiner positions the ForceTrac transducer (see picture below) between the limb or body part where the resistance will be applied and the hand applying the resistance.



The flat probe is recommended for the trunk and large limbs, while the curved probe is recommended for the head and thin limbs.

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## TECHNICAL SPECIFICATIONS

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|                         |                            |
|-------------------------|----------------------------|
| Dimensions              | 93mm x 63mm x 25mm         |
| Weight                  | 94g                        |
| Input range (force)     | 0–100 lbf                  |
| Safe overload           | 250 lbf                    |
| Accuracy                | ± (0.1lbf + 5% of reading) |
| Zero-level output       | 2.048V                     |
| Full scale output swing | 1V at 100 lbs load         |
| Power supply            | 7.26V                      |

### **Algometer Attachment:**

|            |                        |
|------------|------------------------|
| Dimensions | 69mm x 11mm (diameter) |
| Weight     | 14g                    |
| Material   | Aluminum               |

### **Flat Tester Attachment:**

|            |                       |
|------------|-----------------------|
| Dimensions | 9mm x 42mm (diameter) |
| Weight     | 39g                   |
| Material   | Neoprene              |

### **Curved Tester Attachment:**

|            |                        |
|------------|------------------------|
| Dimensions | 19mm x 42mm (diameter) |
| Weight     | 52g                    |
| Material   | Neoprene               |

### Recommended Connectivity for Electrical Safety

Thought Technology recommends the use of TT Sensor Isolator SE9405AM when interfacing client connected sensor(s) to line powered equipment(s) or devices.

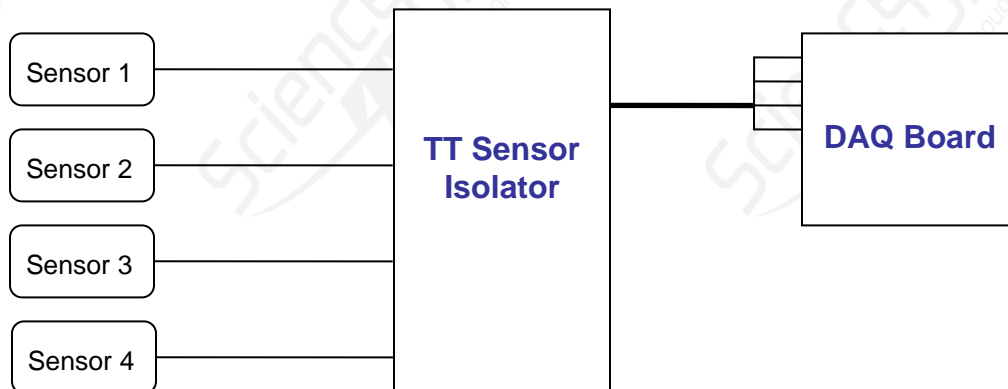


The TT Sensor Isolator SE9405AM is an interface device providing medical grade electrical isolation between the client connected sensors and the acquisition system. It provides the equivalent of Two Means of Client Protection under IEC 60601-1, and supplies battery power to the sensors. Using this device ensures Thought Technology sensors are safely interfaced to the analog inputs of line-powered systems such as computers with DAQ cards.

**Note that this device isolates only between sensors and the DAQ interface, not between different sensor channels.**

The TT Sensor Isolator can interface up to 4 sensors to a DAQ card. TT Sensor Isolator can be connected to the DAQ card in two ways:

- via two stereo jacks, or
- via a DB-15 connector; a BNC interface cable (SA9409BNC) or a pigtail cable (SA9409PGT) can be provided with the unit.



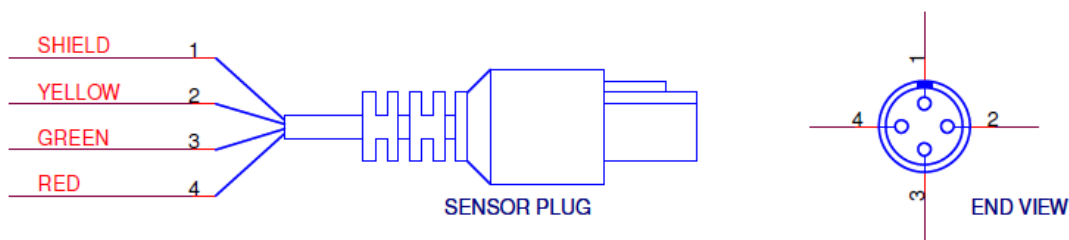
For more detailed information on the Sensor Isolator 4<sup>∞</sup>, consult the Thought Technology Science Division website or contact the sales department or an authorized distributor.

## Direct Connectivity for Electrically Isolated Systems

The following notes are provided for qualified users to directly interface Thought Technology sensors with external systems.

To interface with a sensor, a single sensor cable may be cut in half. Both sides can then be used to make custom interfacing cables by stripping the outer insulation of each required conductor. The sensor cable contains 4 color coded conductors. The table below shows the color coding and pin connector assignment.

| Pin | Color code     | Function              | Note  |
|-----|----------------|-----------------------|---|
| 1   | metal (shield) | ground                | Signal and power ground, connection required.   |
| 2   | yellow         | auxiliary (sensor ID) | No connection required.   |
| 3   | green          | signal                | Sensor output signal  |
| 4   | red            | sensor power          | Supply voltage, +7.26V referenced to ground. Note: sensor performance may be sensitive to supply voltage. |



### Notes:

1. The nominal supply voltage for this sensor is 7.26V. This sensor can safely be used with a supply voltage of up to 9V.

## Recommended Specifications for DAQ Hardware

- Recommended resolution of 0.15mV (16-bit ADC over 10V span) or better
- Minimum input range:
  - If connected via SE9405AM Sensor Isolator, choose 0-5V (unipolar) or  $\pm 5V$  (bipolar)
  - If directly connected to DAQ, choose  $\pm 5V$  (bipolar).

## Simplified Transfer Function

$$F_N = 444.82V_{out} - 1245.5$$

$$F_{lb} = 100V_{out} - 280$$

Conversion of voltage [V] to force [N]

Conversion of voltage [V] to force [lb]