Science Division

Thought Technology Ltd

pIR SENSOR T2600

Measure **More**

Sense **Better**

Technical Note Series

pIR SENSOR (T2600)

IMPORTANT OPERATION INFORMATION

- 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

The pIR sensor is a passive infrared temperature sensor for measuring radiated temperature in the infrared range. It is used to measure the changes in forehead temperature when attached to the pIR HEadGear^{TM}.

Passive infrared temperature is measured in degrees Celsius or degrees Fahrenheit.

Area of interest: The pIR sensor is designed to be used in pairs and fixed to the pIR HEadGear^{TM}, such that the forehead region shown in the diagram to the right is adequately monitored.
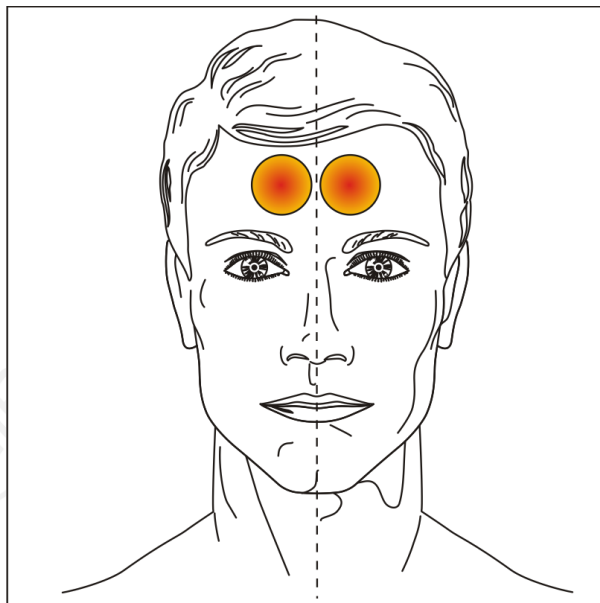
pIR HEadGear^{TM}: The headgear is made of thin, lightweight plastic and holds two adjacent pIR sensors in the configuration shown to the right (see *rear view*).

It should be placed on the forehead with the strap adjusted for stability and comfort. The location should be such that the sensor view should cover the forehead region of interest shown above. The images below show the ideal location of the head gear.

rear view:

front view:

Size (approx.)	37mm x 37mm x 12mm (1.45" x 1.45" x .45")
Weight (approx.)	12.5g (0.5oz)
Absolute measurement accuracy	± 0.5C
Measurement Resolution	0.02C
Measurement range	19.76C – 40.24C
Operating Temperature (room ambient)	20C - 30C
Target emissivity	98.0%
Sensor warm-up time	60 seconds
Supply voltage	7.26V
Max. supply current	2.5mA

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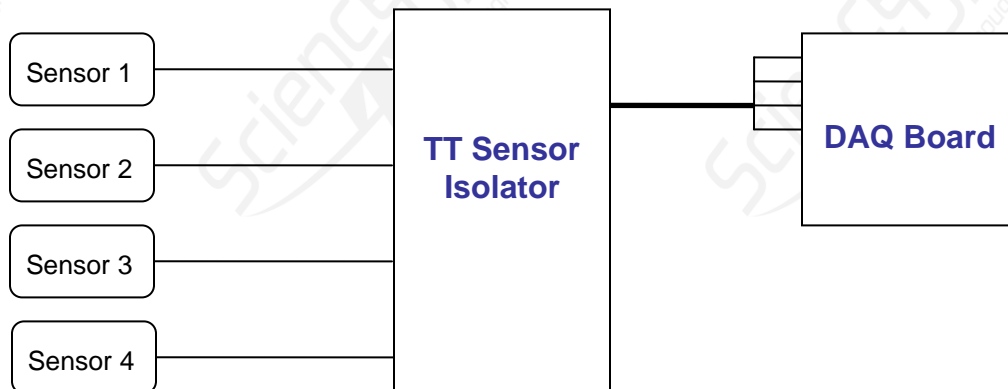
For more detailed information on the Sensor Isolator 4∞, consult the Thought Technology Science Division website or contact the sales department or an authorized distributor.

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.
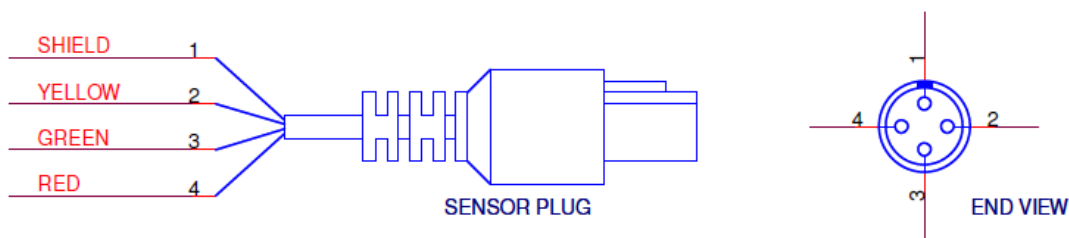
Notes:

1. The nominal supply voltage for this sensor is 7.26V. The 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 ±5V (bipolar)
    - If directly connected to DAQ, choose ±5V (bipolar).

Simplified Transfer Function

$V_{out} = 0.08076T + 0.0645$ Temperature in Celsius to output voltage in volts

$T_C = 12.382V_{out} - 0.7993$ Voltage [V] conversion to temperature [°C]

$T_F = 22.288V_{out} + 30.561$ Voltage [V] conversion to temperature [°F]