

FOTS100 FIBER OPTIC TEMPERATURE SYSTEM

FOTS100 Control Unit

TSD180/182/181 Fiber Optic Temperature Probes

This is a stand alone system, but it can also be interfaced to BIOPAC modules using BIOPAC interface cables.

Use with high-accuracy, MRI-conditional fiber optic temperature probes TSD180, TSD182 or TSD181.

FOTS100 includes control unit with RS-232 port, ± 5 V analog output, and rubber boot; power via 12 V AC/DC wall transformer adapter. (Battery operation no longer supported.)

The analog output parameters comprise the scale factor and the offset. The scale factor corresponds to the physical unit per Volt (unit/V) outputted by the system, while the offset corresponds to the physical value at which the user wants the analog output to be at zero volt.

For example, with a scale factor set to $10^{\circ} \text{C} / \text{V}$ and the offset set to 5°C , the temperature as a function of the analog output voltage is given by:

$$\text{Temperature} = [\text{Voltage output}] \times 10^{\circ} \text{C} / \text{V} + 5^{\circ} \text{C}.$$

The default value of the scale factor is $50^{\circ} \text{C} / \text{V}$ (or its equivalent in $^{\circ}\text{F}$) and the default value of the offset is 0°C (or its equivalent in $^{\circ}\text{F}$). During a No Signal condition, the analog output and the serial ports output constant values as follow:

Output	No Signal condition output value
Analog	0 Volt
RS-232	65 536.0

For more details, please see the complete [FOTS100 User Manual](#), available online.

FOTS100 Specifications

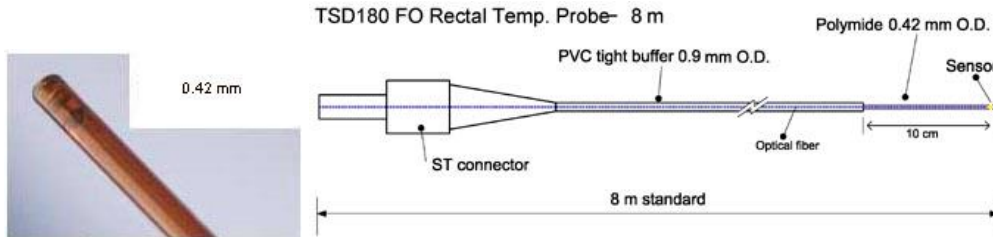
Output interface:	Display, ± 5 Volts Analog output, and RS-232 standard
Interface for MP160 System:	Add CBL101 3.5 mm mono phone plug to male RCA + CBL122 unisolated RJ11 to 3.5 mm jack (purchased separately)
Interface for MP150/100 System:	Add CBL101 3.5 mm mono phone plug to male RCA (purchased separately)
Interface for MP36/35 System:	Add SS70LA isolated BNC interface and a BNC-to-RCA cable (purchased separately)
Channels:	One
Compatibility:	TSD180, TSD182 and TSD181 high accuracy fiber-optic temperature sensors
Accuracy:	$\pm 0.3^{\circ} \text{C}$ (Total accuracy - includes both signal conditioner and transducer errors)
Temperature range:	20°C to 60°C (higher range also available)
Resolution:	0.1°C
Sampling rate:	50 Hz (20 ms)
Communication protocol:	SCPI (default)
Input power:	12 VDC (AC/DC wall-transformer adapter included)
Consumption:	1.8 Watts typical
Enclosure:	Plastic casing with a removable rubber boot protection
Dimensions (without rubber boot protection):	45 mm (H) x 105 mm (W) x 165 mm (L)
Storage temperature:	-40°C to 65°C
Operating temperature:	0°C to 45°C
Humidity:	95% non condensing
Light source life span:	> 150,000 hours (> 17 years) MTBF



TSD180 & TSD182 RECTAL TEMP PROBE: 420 µm OD Polyimide tubing, 8 m (TSD180), 3 m (TSD182)

MRI Use: MR Conditional

Condition: Max MR field strength 3T; FOTS100 module stays in the control room.



- The Polyimide round tubing protects the sensing element its flexibility and rigidity provide excellent pushability.

TSD181 SURFACE TEMP PROBE: Sensor 1 mm OD, PFA tubing 0.9 mm OD, 8 m

- Cable sheath rated up to 85° C.



TSD180, TSD182 and TSD181 Specifications

SPECS	TSD180 and TSD182	TSD181
Temperature range:	0° C to +85° C (other ranges AUR)	
Response Time:	250 ms and better	1.5 sec. typical
Temperature operating & calibrated range:	20° C to 45° C (other ranges AUR)	
Accuracy:	±0.2° C (Total accuracy over the calibrated range including both signal conditioner and sensor errors)	±0.3° C (Total accuracy over the calibrated range including both signal conditioner and sensor errors)
Resolution:	0.05° C	
Operating humidity range:	0-100%	
MRI/EMI/RFI susceptibility:	Complete immunity	
Calibration:	NIST traceable	
Optical connector:	ST standard	
Cable sheathing:	420 µm OD of Polyimide tubing; 900 µm OD tight buffer PVC	3 mm OD Kevlar reinforced PVC cable
Cable length:	8 m (TSD180/181) 3 m (TSD182)	
Signal conditioner compatibility:	FOTS100 system	
Interface:	FOTS100 is a stand alone Fiber Optic Temperature System	
Optional interface:	MP160 or MP150 System via FOTS100 and CBL101	