

T-BAR

Features and Specification

Overview

- The T-Bar is a combination of one Sensor housed inside a pointed (insertion) probe, together with power source (battery), radio transmitter, real-time clock and data storage facilities, in a rugged stainless-steel enclosure
- The T-Bar comprises a single PCB mounted within a custom stainless steel enclosure, sealed to better than IP68. An internal antenna is contained with a nylon end-cap. The unit is designed for insertion into food products during cooking and/or blast freezing operations.
- The temperature sensor covers the range from -40°C to $+85^{\circ}\text{C}$.
- All communication such as upload of settings and download of data is via radio link
- Radio range: up to 300 metres in free space
- The T-Bar is in continual communication with other elements of *System5*



Functions

- Measurement, storage and transmission of accurate temperature readings at predefined intervals
- Automatic fixed recording intervals of 10 minutes and 1 hour
- Automatic and continual broadcast of current data to BASE units (optionally via ECHO units)
- Can be contacted (using *System5* PC application and BASE unit) to download all stored 10-minute and 1-hour records

Data

- Temperature accuracy $\pm 0.5^{\circ}\text{C}$ between -40°C and $+85^{\circ}\text{C}$
- Optional calibration $\pm 0.2^{\circ}\text{C}$ between -40°C and $+85^{\circ}\text{C}$
- Unique fixed serial number pre-programmed into each unit.
- Overwrites oldest data when full
- Non-volatile data storage
- 4000 date/time/temperature records, divided between three separate logging intervals:
 - 2000 records with 10-minute data, covering the last 13+ days;
 - 2000 records with 60-minute data, covering the last 80+ days.
- Calibration data table. Fully assembled product can be recalibrated by radio link
- Build level data (software and hardware versions) retrievable by radio link

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Interfaces

- Low-power Radio :
 - Frequency: 433.9 MHz (UK/Europe), licence-free band. R&TTE harmonised standard
 - Power: max 10mW (+10dBm), duty cycle <0.1%
 - Transmission rate (broadcast mode) approx. every 60 seconds
 - Length of radio packet approx.20-30 ms
- Setup (configuration) options selected on PC and transmitted by radio link via BASE unit
- Calibration data for temperature sensor (authorised users only) Can be reconfigured (by radio link) for calibration offsets at 64 distinct points
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- Download time approx 300 records per second, fully error-checked
- Download includes full configuration details:
 - unique IceSpy recognition,
 - serial number,
 - received signal level,
 - build standard hardware,
 - software version number,
 - CRC data check value
 - calibration (authorised users only)
- Information transmitted in broadcast:
 - unique IceSpy recognition,
 - serial number,
 - latest value, e.g. temperature
 - CRC data check value.

Environment / Mechanical / Electrical

Operating temp. range: -40°C to +85°C, humidity 0-100%

Storage temperature range: -40°C to +85°C

- Dimensions: body length 173mm, probe length 125mm
- Case: 304 stainless steel case with 316 stainless steel insertion probe and 'delrin' endcap for sealing antenna
- Weight: 256g
- Dust / Waterproofing: better than IP68
- Battery Sealed into unit, Life 5 years at 25°C