

# Multi-Channel Infrared Temperature Monitoring System RS485/Modbus®

OS-MINIHUB



- ✔ Miniature Non-Contact Temperature Sensors with RS485 Modbus Communications
- ✔ Touch Screen Display Optional for Configuration, Display, Alarms and Data Logging
- ✔ Low-Cost Standalone 6-Channel System
- ✔ Build Larger Systems Using the TSD600's Separate Modbus Master and Slave Interfaces
- ✔ Analog and Alarm Relay Outputs via Optional Modules
- ✔ Conforms to Industrial EMC Standards

The OS-MINIHUB is an industrial infrared temperature monitoring system, with miniature sensing heads and optional display modules.

OS-MINIHUB sensors are designed to measure the surface temperature of non-reflective materials in industrial applications, from -20 to 1000°C (-4 to 1832°F). They are sealed to NEMA 4 (IP65), built from 316 stainless steel, and fully tested to industrial EMC standards.

They can measure food, paper, thick plastics, asphalt, paint, bulk materials and organic materials, as well as most dirty, rusty or oily surfaces.

## Robust

OS-MINIHUB sensors have an operating temperature rating of up to 120°C (248°F) with no need for cooling.



OS-MINIHUB shown smaller than actual size.

## Compact

The sensors measure just 45 mm (1.7") long (plus cable gland), so they can fit into the smallest of spaces.

## Configurable

Up to 6 sensors can be connected to the optional TSD600 interface module, which provides temperature display, configuration, and high-capacity data logging to a MicroSD Card. Analog and relay outputs are available via separate DIN rail mounted modules.

## Low Cost

With up to 6 sensors connected to one TSD600, the OS-MINIHUB is an ideal low-cost non-contact temperature measurement system.

## Networkable

To measure more than 6 locations, OS-MINIHUB sensors and TSD600 sub-networks may be connected to an RS485 Modbus SCADA system or PLC. It is possible to measure the temperature of hundreds or thousands of locations on the same network.

## Applications

The OS-MINIHUB may be installed as a new temperature monitoring system, or integrated into an existing Modbus network. With two Modbus interfaces, the TSD600 makes an ideal local display for a group of sensors as part of a larger system.

The OS-MINIHUB-JB6 junction box makes it easy to connect the system together.

Never miss a critical temperature event. In condition monitoring applications, the OS-MINIHUB system is an always-on solution that can replace manual checks with a handheld thermometer or expensive thermal imager.

## Typical Applications Curing Ovens

Fiberglass impregnated with epoxy is cured in an oven to increase strength. OS-MINIHUB sensors are placed inside the oven at up to 120°C (248°F), to build-up a temperature profile at many points on the entire surface of the workpiece, and to communicate the measured temperature to the heating system that controls the hot air blowers in the oven. Industries include boatbuilding and aerospace as well as many others.

## Industrial Bakeries

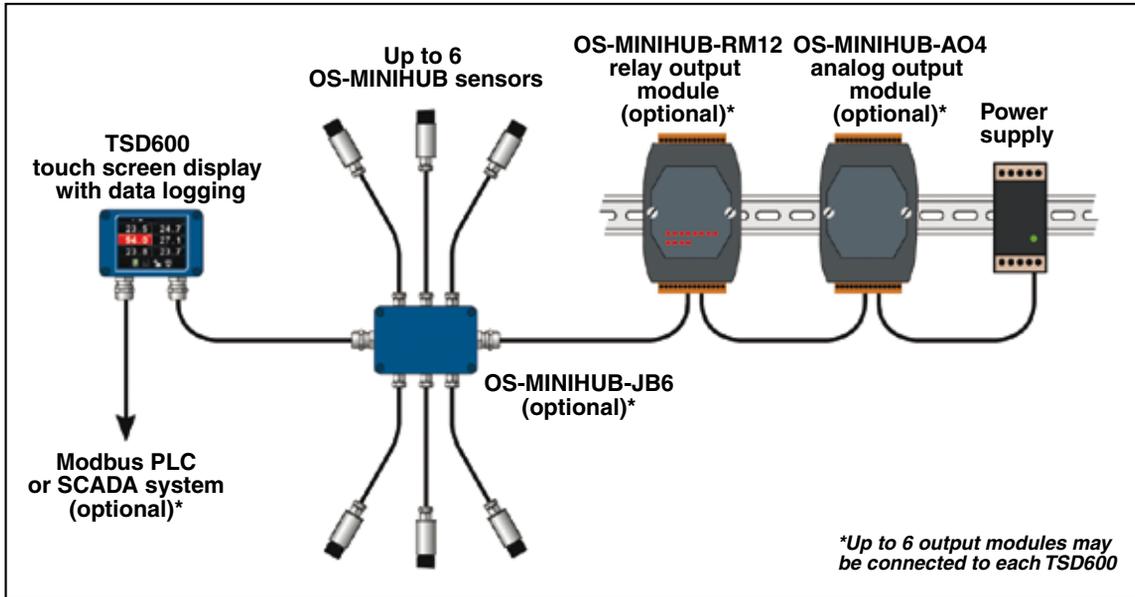
Check the temperature profile of bakery products at multiple points along a conveyor oven.

## Corrugated Board Manufacturing

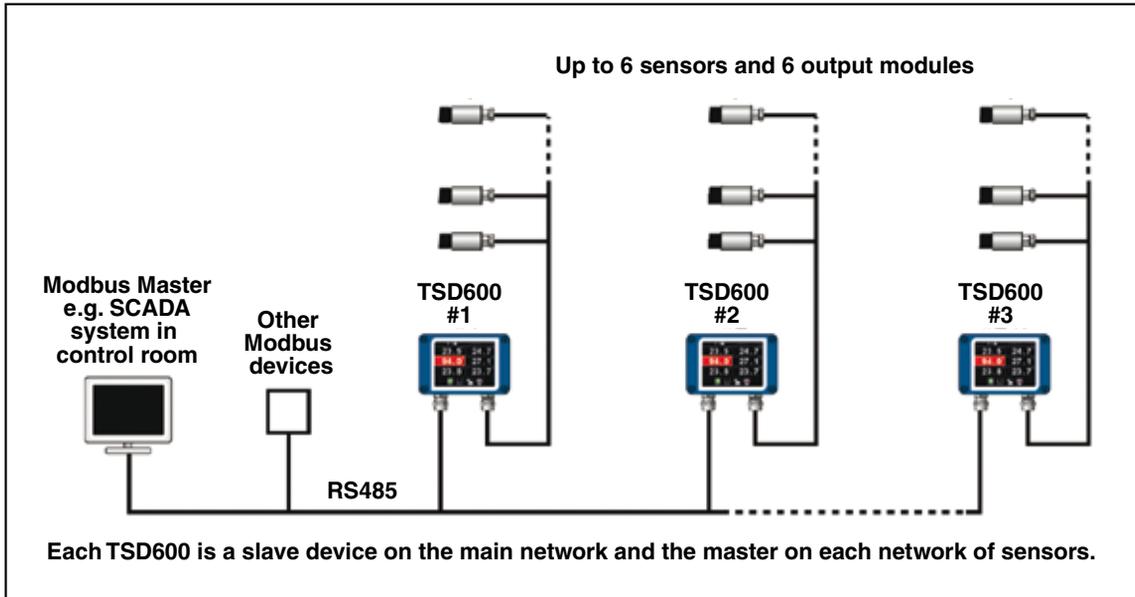
Monitor the web temperature along an entire corrugator, with local displays for each section of the production line, and centralized monitoring in the control room. Sensors withstand 120°C (248°F), and can be used in high-temperature areas such as single facers without cooling.



## TSD600 as Modbus Master



## TSD600 as Modbus Slave



### Power Distribution

Monitor the temperature of bulbar joints in switchgear cabinets. Hundreds or even thousands of points can be monitored on the same network using the OS-MINIHUB system.

### Automotive

A large system of OS-MINIHUB sensors can monitor the paint curing process at several points. Monitor temperatures around the entire vehicle in environmental test chambers.

### Condition Monitoring

A network of OS-MINIHUB sensors can monitor all the bearing temperatures on a machine, a runout table, or the whole factory. The OS-MINIHUB is ideal for measuring the temperature of all painted metal surfaces.

### Infrared Curing

Arrays of sensors fitted on a rig of infrared curing lamps ensure an even temperature profile along the part being cured. Surface coatings, paint and epoxy are ideal target materials, among many others.

### Gas Cylinder Filling

Monitor temperatures to improve repeatability in the filled volume and improve filling efficiency. The temperature of every cylinder on a filling rig is easily monitored with no need to manually move contact probes.

## TSD600 6-Channel Touch Screen Terminal

- ✔ Configure, Display and Log Data and Alarms from Up to 6 Sensors per Terminal Unit, Simultaneously or Individually
- ✔ Operates as Modbus® Master and Modbus Slave
- ✔ High Capacity Data Logging to MicroSD Card
- ✔ Bright Touch Screen with Backlight
- ✔ Analog and Relay Outputs via Optional ICP DAS Modules
- ✔ 2-Channel Scrolling Temperature Chart

### Specifications

**Temperature Range:** -20 to 1000°C (-4 to 1832°F)

**Interface:** RS485 Modbus RTU

**Accuracy:** ±1% of reading or ±1°C whichever is greater

**Repeatability:** ±0.5% of reading or ±0.5°C whichever is greater

**Emissivity Setting:** 0.2 to 1.0

**Response Time, t90:** 240 ms (90% response)

**Spectral Range:** 8 to 14 μm

**Supply Voltage:** 6 to 28 Vdc

**Optional AC Power:** 100 to 240 Vac, 0.3 A

**Supply Current:** 50 mA max

**Baud Rate:** 9600 baud \*

**Format:** 8 data bits, no parity, 1 stop bit \*

\* Other configurations available upon request.

### CONFIGURATION

**Configuration Method:** Via TSD600 touch screen, or directly via RS485 Modbus

**Configurable Parameters:** Emissivity Setting, Averaging, Peak/Valley Hold Processing, Reflected Energy Compensation

### MECHANICAL

**Construction:** Stainless Steel

**Dimensions:** 18 dia x 45 mm L (0.7 x 1.7")

**Thread Mounting:** M16 x 1 mm pitch (0.03")

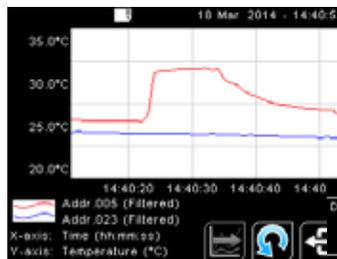
**Cable Length:** 1 m (3.3') (longer lengths available to order)

**Weight with Cable:** 85 g (3 oz)

### ENVIRONMENTAL

**Environmental Rating:** IP65

**Ambient Temperature:** 0 to 120°C (32 to 248°F)



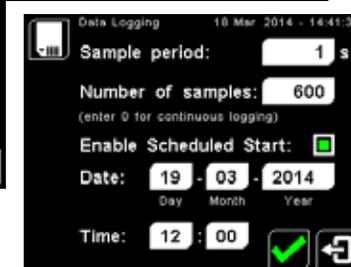
Display temperature data from two channels in a scrolling graph.



Display and configure all 6 channels individually or simultaneously. Displays channels in red in alarm condition.



Configure options for each sensor and the TSD600 itself via the touch screen interface.



Schedule a start time, or start and stop logging at the touch of an icon. Temperature data and alarm events can be logged to a microSD card (not included).

**Relative Humidity:** 95% max non-condensing

### CONFORMITY

**Electromagnetic Compatibility:** EN61326-1, EN61326-2-3 (Electrical Equipment for Measurement, Control and Laboratory Use - EMC Requirements - Industrial)

### 6-Channel Display Module Specifications

**Display:** 72 mm (2.83") resistive touch TFT, 320 x 240 pixels, backlit

**Supply Voltage:** 10 to 30 Vdc

**Maximum Current Draw:** 100 mA

**Configurable Parameters (Global):** Temperature units, date and time, data logging, graph channels, alarm logging

#### Configurable Parameters

**(per Channel):** Signal processing, emissivity setting, reflected energy compensation, alarms, Modbus address

**Alarm Configuration:** 12 alarms (2 per sensor) with adjustable level, individually configurable as HI or LO

**Temperature Units:** °C or °F selectable

**Temperature Resolution:** 0.1°

**Signal Processing:** Average, peak hold, valley hold, minimum, maximum

**Display Sample Period:** 120 ms per sensor (720 ms in total for 6 sensors)

### DATA LOGGING

**Logging Interval:** 1 to 86,400 seconds (1 day)

**MicroSD Card Max Capacity:** 32 GB (not included)

**Internal Clock Battery:** 1 x BR 1225 3V (not included)

**Variables Logged:** Target temperature, sensing head temperature, alarm events

**File Format:** .csv (can be imported to Excel®)

**Configurable Parameters:** Sample period, number of samples, scheduled start date and time

### MECHANICAL

**Construction:** Die cast aluminum

**Electrical Connections:** Removable screw terminals, 28 AWG to 18 AWG

**Dimensions:** 98 W x 64 H x 36 mm D (3.8 x 2.5 x 1.4"), excluding cable glands

**Weight:** 280 g (0.6 lb)

### ENVIRONMENTAL

**Environmental Rating:** NEMA 4 (IP65)

**Ambient Temperature Range:** 0 to 60°C (32 to 140°F)

**Relative Humidity:** Maximum 95%, non-condensing

### CONFORMITY

**CE Marked**

**RoHS Compliant**

**Electromagnetic Compatibility:** EN61326-1, EN61326-2-3 (Electrical Equipment for Measurement, Control and Laboratory Use - EMC Requirements - Industrial)

### OS-MINI HUB Specifications

**Construction:** Die cast aluminum

**Electrical Connections:** Removable screw terminals, 28 to 18 AWG

**Weight:** 250 g (8.8 oz)

**Environmental Rating:** IP65

**Enclosure Dimensions:** 98 W x 64 H x 36 mm D (3.8 x 2.5 x 1.4")



OS-MINIHUB shown smaller than actual size.

To Order	
Model No.	Description
<b>Sensors</b>	
OS-MINIHUB-SN21	Sensor head with 2:1 divergent optics, 1 m (3.3') cable
OS-MINIHUB-SN201	Sensor head with 20:1 divergent optics, 1 m (3.3') cable
OS-MINIHUB-SN801	Sensor head with 8:1 divergent optics, 1 m (3.3') cable
<b>BUS Components</b>	
OS-MINIHUB-JB6	6-channel junction box, IP65
OS-MINIHUB-RM12	12-channel relay output module
OS-MINIHUB-AO4	4-channel voltage or current analog output module

#### Accessories

Model No.	Description
OS210-APSW	Air purge collar for SN21 Sensor
OS210-APSN	Air purge collar for SN201 and SN801 Sensors
OS210-PWS	Protective plastic window
OS210-FBS	Fixed mounting bracket (1-axis)
OS210-ABS	Adjustable mounting bracket (2-axis)
<b>Laser Sighting</b>	
OS210-LSTS	Laser sighting tool (including laser)
OS-MINI-LSF	Dual laser continuous laser sighting bracket fixed (1-axis)
OS-MINI-LSA	Dual laser continuous laser sighting bracket adjustable (2-axis)
<b>Display</b>	
TSD600	6-channel touch screen display module (10 to 30 Vdc)
TSD600-MA	6-channel touch screen display (240 Vac)
MINI-MSD	MicroSD card for TSD600 data logging
<b>Calibration Option</b>	
-CALA {suffix}	UKAS traceable calibration certificate, add suffix to each sensor to be calibrated

For extra cable length add a suffix  $-(\text{length in whole meters})$  i.e. OS-MINIHUB-SN21-6

**Ordering Examples:** A complete system with 6 sensors and 4 analog outputs:

Qty 5: **OS-MINIHUB-SN201-3**, 5 sensors with 20:1 optics and 3 m (10') cable (2 extra meters of cable each).

Qty 1: **OS-MINIHUB-SN201-3-CALA**, 1 sensors with 20:1 optics, 3 m (10') cable with calibration certificate.

Qty 6: **OS210-FBS**, 6 fixed mounting brackets.

Qty 1: **OS210-LSTS**, 1 laser sighting tool to align each sensor.

Qty 1: **OSMINIHUB-JB6**, 6-channel IP65 junction box.

Qty 1: **OSMINIHUB-AO4**, 4-channel analog output module.

Qty 1: **TSD600**, 6-channel touch screen display module.

Qty 1: **MINI-MSD**, 1 Micro-SD card for TSD600 data logging.