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.

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
- 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.
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)
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)

VariablesLogged: Target temperature, sensing head temperature, alarm events
File Format: .csv (can be imported to Excel®)
Configurable Parameters: 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).

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-MINIHUB 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")
## To Order

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sensors</strong></td>
<td></td>
</tr>
<tr>
<td>OS-MINIHUB-SN21</td>
<td>Sensor head with 2:1 divergent optics, 1 m (3.3') cable</td>
</tr>
<tr>
<td>OS-MINIHUB-SN201</td>
<td>Sensor head with 20:1 divergent optics, 1 m (3.3') cable</td>
</tr>
<tr>
<td><strong>BUS Components</strong></td>
<td></td>
</tr>
<tr>
<td>OS-MINIHUB-JB6</td>
<td>6-channel junction box, IP65</td>
</tr>
<tr>
<td>OS-MINIHUB-RM12</td>
<td>12-channel relay output module</td>
</tr>
<tr>
<td>OS-MINIHUB-AO4</td>
<td>4-channel voltage or current analog output module</td>
</tr>
<tr>
<td><strong>Accessories</strong></td>
<td></td>
</tr>
<tr>
<td>OS210-FBS</td>
<td>Fixed mounting bracket (1-axis)</td>
</tr>
<tr>
<td>OS210-ABS</td>
<td>Adjustable mounting bracket (2-axis)</td>
</tr>
<tr>
<td><strong>Laser Sighting</strong></td>
<td></td>
</tr>
<tr>
<td>OS210-LSTS</td>
<td>Laser sighting tool (including laser)</td>
</tr>
<tr>
<td>OS-MINI-LSF</td>
<td>Dual laser continuous laser sighting bracket fixed (1-axis)</td>
</tr>
<tr>
<td>OS-MINI-LSA</td>
<td>Dual laser continuous laser sighting bracket adjustable (2-axis)</td>
</tr>
<tr>
<td><strong>Display</strong></td>
<td></td>
</tr>
<tr>
<td>TSD600</td>
<td>6-channel touch screen display module (10 to 30 Vdc)</td>
</tr>
<tr>
<td>TSD600-MA</td>
<td>6-channel touch screen display (240 Vac)</td>
</tr>
<tr>
<td>MINI-MSD</td>
<td>MicroSD card for TSD600 data logging</td>
</tr>
<tr>
<td><strong>Calibration Option</strong></td>
<td></td>
</tr>
<tr>
<td>-CALA (suffix)</td>
<td>UKAS traceable calibration certificate, add suffix to each sensor to be calibrated</td>
</tr>
</tbody>
</table>

For extra cable length add a suffix –{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: OS-MINIHUB-JB6, 6-channel IP65 junction box.
- Qty 1: OS-MINIHUB-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.