

## Eight Channel Web-Enabled Temperature Measurement Module

### OM-WEB-TEMP



- ✓ Built-In Web Server
- ✓ 8 Differential Input Channels
- ✓ Supports Thermocouples (Types J, K, T, E, N, R, S, B), RTDs, Thermistors and Semiconductor Temperature Sensors
- ✓ Built-In Cold Junction Compensation and Open Thermocouple Detection
- ✓ 24-Bit Measurement System
- ✓ 8 Digital I/O—User Configurable for Alarms

The OM-WEB-TEMP is a temperature measurement device with built-in web server. Simply connect the device to an Ethernet port or hub and view current data using a standard web browser.

The OM-WEB-TEMP's embedded web interface provides access to current data and configuration settings using a standard web browser. Browse to the device's home page by entering the URL that is printed on the device into the browser. View current sensor measurements and channel data, and configure hardware options from the device's home page. Only one user can change configuration options on the device at a time. The web interface is built into the device's firmware, and does not need to be installed on a computer. No external software is required other than a web browser and a TCP/IP connection. Connect the device's 10Base-T Ethernet port to a local or wide area network using the supplied ethernet cable, to a single computer through a hub using the supplied ethernet cable, or directly to a computer using a standard CAT-5 crossover cable.

The web browser used to access the OM-WEB-TEMP's web interface must support JavaScript.

The OM-WEB-TEMP provides 8 temperature channels and 8 digital I/O channels. The included external power supply (ac adaptor) is used to provide power. On-board LEDs display the status of communications

OM-WEB-TEMP shown smaller than actual size.

and external power. All hardware configurable options are selectable with the web browser or the included InstaCal™ utility software. Network configurable options are settable using InstaCal. When using InstaCal, if the login settings have been changed from the default, a login name and password are required to change the configuration settings.

The OM-WEB-TEMP provides 8 differential input channels that are software programmable for different sensor types including:

- Thermocouple Types J, K, T, E, R, S, B, N
- RTD—2, 3 or 4-wire Pt100 RTDs
- 2-, 3- or 4-wire thermistor measurements
- Semiconductor temperature sensors—LM36 or equivalent

The OM-WEB-TEMP provides a 24-bit analog-to-digital (A/D) converter for each pair of differential analog input channels. Each pair of differential inputs constitutes a channel pair. A different type of sensor (i.e., thermocouple, RTD, thermistor or semiconductor) can be connected to each channel pair, however both channels in the channel pair need to be the same sensor type (although if thermocouples are connected it is possible to mix thermocouple types).

The OM-WEB-TEMP provides four integrated cold junction compensation (CJC) sensors for thermocouple measurements and built-in current excitation sources for resistive sensor measurements. Each CJC sensor is dedicated to one of the four channel pairs. An open thermocouple detection feature allows detection of a broken thermocouple. An onboard microprocessor automatically linearizes the measurement data.



The OM-WEB-TEMP features 8 independent temperature alarms. Each alarm controls an associated digital I/O channel as an alarm output. The input to each alarm is one of the temperature input channels. The output of each alarm is software configurable as an active high or low. The user configurable threshold conditions activate each alarm. When an alarm is activated, the associated DIO channel is driven to the active output state selected.

Eight digital I/O channels are provided to communicate with external devices and to generate alarms. The digital bits are software programmable for input or output.

The digital output voltage is switch-selectable for 3.3V or 5V logic. A screw terminal is provided for pull-up or pull-down configuration.

The OM-WEB-TEMP web interface displays current data read from the device and does not log or store historical data. Use the included TracerDAQ software to log or graphically trend your data.

The OM-WEB-TEMP module ships with an impressive array of software, including TracerDAQ®, a full-featured, out-of-the-box data logging, viewing, and analysis application. Driver support and detailed example programs are included for Universal Library programming libraries for Microsoft® Visual Studio® programming languages, and other languages, including DASyLab®, and ULx for NI LabVIEW® (comprehensive library of VIs and example programs compatible with 32-bit and 64-bit LabVIEW 2010 or later) and InstaCal™ installation, calibration

and test utility-powerful solutions for programmers and nonprogrammers alike. These modules operate under Microsoft Windows® VISTA/7/8/10 (32-bit and 64-bit) operating systems. The OM-WEB-TEMP data acquisition module is supplied with TracerDAQ software which is a collection of four virtual instrument applications used to graphically display and store input data and generate output signals:

- Strip Chart—Log and graph values acquire from analog inputs, digital inputs, temperature inputs and counter inputs
- Oscilloscope—Display values acquired from analog inputs
- Function Generator—Generate waveforms for analog outputs
- Rate Generator—Generate waveforms for counter outputs

## Specifications

### ANALOG INPUTS

**A/D Converter:** 4 dual 24-bit sigma delta A/D converters

**Input Isolation:** 500 Vdc minimum between field wiring and USB interface

**Number of Channels:** 8 differential temperature inputs

**Differential Input Voltage Range:**

Thermocouple,  $\pm 0.080V$

RTD: 0 to 0.5V

Thermistor: 0 to 2V

Semiconductor: 0 to 2.5V

**Absolute Maximum Input Voltage:**

$\pm 25V$  (power on),  $\pm 40V$  (power off)

**Throughput Rate:** 2 samples/sec maximum for all active channels

**Input Impedance:** 5 G $\Omega$  minimum

**Input Leakage Current:**

105 nA maximum (with open thermocouple detection enabled)

**Normal Mode Rejection Ratio:**

90 dB minimum

**Common Mode Rejection Ratio:**

100 dB minimum

**Warm-Up Time:** 30 minutes maximum

**Thermocouple Input:** Software programmable for type J, K, T, E, R, S, B, N

**Open Thermocouple Detection:**

3 sec open detection time (maximum)

**CJC Sensor Accuracy:**

-0.75 to 0.5°C maximum (15 to 35°C);

-1.5 to 1.25°C maximum (0 to 55°C)

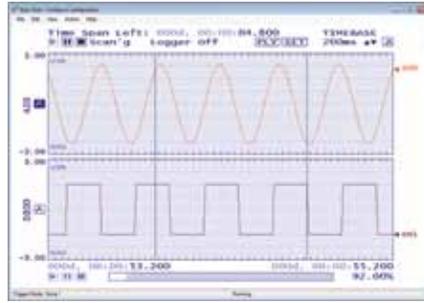
**Pt100 RTD Input:** 2-, 3- or 4-wire DIN 43760, alpha = 0.00385, SAMA, alpha = 0.003911, ITS-90/IEC751, alpha = 0.0038505 (3- or 4-wire connections take up 2 differential channels)

**Thermistor Input:** 2-, 3- or 4-wire standard 2252 through 30,000  $\Omega$

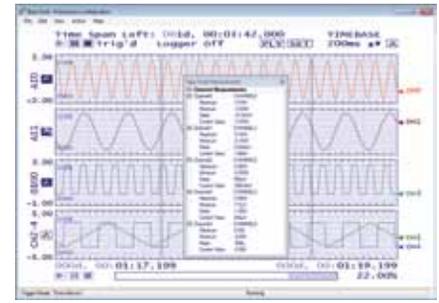
(3- or 4-wire connections take up 2 differential channels)

**Semiconductor Sensor:**

TMP36 or equivalent



TracerDAQ Strip Chart.



TracerDAQ Pro Strip Chart with Measurements.

TracerDAQ PRO is an enhanced version of TracerDAQ and is available as a purchased upgrade (SWD-TRACERDAQ-PRO).

A comparison of some of the features included in TracerDAQ vs TracerDAQ PRO is shown below.

## Features Comparison

### Strip Chart

Feature	TracerDAQ	TracerDAQ PRO
Channel Types	Analog input, temperature input, digital input, event counter	Analog input, temperature input, digital input, event counter
Number of Channels	8	48
Number of Lanes	2	8
Maximum Samples Per Channel	32,000	1 million
Alarm Conditions	No	Yes
Measurements Window	No	Yes
Enter Annotations	No	Yes
Software Triggering	No	Yes
Hardware Triggering	No	Yes
Time-of-Day Triggering	No	Yes
Linear Scaling	No	Yes

### Oscilloscope

Feature	TracerDAQ	TracerDAQ PRO
Channel Type	Analog input	Analog input
Number of Channels	2	4
Measurements Window	No	Yes
Reference Channel	No	Yes
Math Channel	No	Yes

### Function Generator

Feature	TracerDAQ	TracerDAQ PRO
Channel Type	Analog output	Analog output
Number of Channels	1	16
Waveform Types	Sine	Sine, square, triangle, flat, pulse, ramp, random, arbitrary
Duty Cycle	No	Yes
Phase	No	Yes
Gate Ratio	No	Yes
Rate Multiplier	No	Yes
Sweep (Linear and Exponential)	No	Yes

### Rate Generator

Feature	TracerDAQ	TracerDAQ PRO
Channel Type	Counter output	Counter output
Number of Channels	1	20

## DIGITAL I/O

**Number of Digital I/O Channels:** 8  
**Type:** CMOS

**Configuration:** Each DIO bit can be independently configured for input or output. Switch selectable output voltages of 5V or 3.3V. Power on reset is input mode unless bit is configured for alarm

**Pull-Up/Pull-Down Configuration:** All pins are connected to 47 kΩ resistors (user configurable for pull-up mode to 5V or pull-down mode).

**Digital I/O Transfer Rate (Software Paced):** Digital input; 50 port reads or single bit reads per second (typical); digital output; 100 port writes or single bit writes per second (typical)

**Input High Voltage:** 4.0V min, 5.5V absolute max (5V mode); 2.64V min, 5.5V absolute maximum (3.3V mode)

**Input Low Voltage:** 1.0V maximum, -0.3V absolute min (5V mode); 0.66V max, -0.3V absolute minimum (3.3V mode)

**Output High Voltage:** 4.3V minimum (5V mode), 2.7V min (3.3V mode); IOH = -2.5 mA

**Output Low Voltage:** 0.6V maximum (IOL = 2.5 mA)

**Temperature Alarms:** 8 (one per digital I/O line)

## Semiconductor Sensor Measurement Accuracy

Sensor Type	Temperature Range	Maximum Error
TMP36 or equivalent	-40 to 150°C (-40 to 302°F)	±0.50°C

## Compatible Thermocouple Input Types

Type	Temperature Range	Accuracy (°C)
J	-210 to 1200°C (-346 to 2192°F)	±1.762 typ, ±3.098 max (-210°C) ±0.724 typ, ±1.282 max (0°C) ±0.684 typ, ±1.178 max (1200°C)
K	-210 to 1372°C (-346 to 2502°F)	±1.843 typ, ±3.318 max (-210°C) ±0.730 typ, ±1.292 max (0°C) ±0.799 typ, ±1.495 max (1372°C)
T	-200 to 400°C (-328 to 752°F)	±1.797 typ, ±3.226 max (-200°C) ±0.754 typ, ±1.334 max (0°C) ±0.496 typ, ±0.856 max (400°C)
E	-200 to 1000°C (-328 to 1832°F)	±1.708 typ, ±3.050 max (-200°C) ±0.826 typ, ±1.465 max (0°C) ±0.564 typ, ±1.010 max (1000°C)
R	-50 to 1768°C (-58 to 3214°F)	±1.124 typ, ±2.010 max (-50°C) ±0.475 typ, ±0.844 max (250°C) ±0.347 typ, ±0.612 max (1768°C)
S	-50 to 1768°C (-58 to 3214°F)	±1.058 typ, ±1.892 max (-50°C) ±0.479 typ, ±0.853 max (250°C) ±0.416 typ, ±0.734 max (1768°C)
B	250 to 1820°C (482 to 3308°F)	±2.192 typ, ±2.199 max (250°C) ±0.821 typ, ±0.824 max (700°C) ±0.469 typ, ±0.471 max (1820°C)
N	-200 to 1300°C (-328 to 2372°F)	±1.897 typ, ±3.406 max (-200°C) ±0.735 typ, ±1.300 max (0°C) ±0.571 typ, ±0.978 max (1300°C)

\* Includes CJC measurement error.

## Thermistor Measurement Accuracy

Thermistor	Temperature Range	Typical Error (°C)	Maximum Error (°C)
2252 Ω	-40°C (-40°F)	±0.0007	±0.001
	0°C (32°F)	±0.008	±0.021
	50°C (122°F)	±0.130	±0.263
	120°C (248°F)	±1.750	±3.473
5000 Ω	-35°C (-31°F)	±0.0006	±0.001
	0°C (32°F)	±0.004	±0.009
	50°C (122°F)	±0.049	±0.115
	120°C (248°F)	±0.658	±1.535
10000 Ω	-25°C (-13°F)	±0.0005	±0.001
	0°C (32°F)	±0.002	±0.005
	50°C (122°F)	±0.028	±0.060
	120°C (248°F)	±0.328	±0.771
30000 Ω	-10°C (14°F)	±0.0005	±0.001
	0°C (32°F)	±0.001	±0.002
	50°C (122°F)	±0.009	±0.019
	120°C (248°F)	±0.128	±0.267

## RTD Measurement Accuracy

Temperature Range	Typical Error (°C)	Maximum Error (°C)
-200°C (-328°F)	±2.784	±2.913
-150°C (-238°F)	±1.070	±1.201
-100°C (-148°F)	±0.349	±0.482
0°C (32°F)	±0.124	±0.261
100°C (212°F)	±0.127	±0.269
300°C (572°F)	±0.136	±0.287
600°C (1112°F)	±0.150	±0.318



OM-Web-Temp shown smaller than actual size.

## NETWORK

### Ethernet Compliance

**Device Type:** IEEE 802.3  
Ethernet 10Base-T

**Device Compatibility:** IEEE  
802.3-2003 10 Mbps Media  
Access Control

### Ethernet Connection

**Ethernet Type:** 10Base-T

**Connector:** RJ-45, 8 position

**Cable:** CAT-5 shielded,  
unshielded twisted pair

**Length:** 100 m (328') maximum

**MAC Address:** 00:12:71:Cx:xx:xx  
where xxxxx is the device's serial  
number

### Network Factory Default Settings

**IP Address:** 192.168.0.101

**Subnet Mask:** 255.255.255.0

**Gateway:** 192.168.0.1

**DHCP Setting:** Enabled

**User Name:** "webtemp"

**Password:** "omega"

**Web Server:** Enabled

### Network Protocols

**Protocols Implemented:** IP,  
ARP, ICMP, DHCP, UDP, TCP,  
NBNS, HTTP

**UDP Messaging Protocol:** UDP  
port 54211

**TCP Downloading Protocol:**  
TCP port 54267

**HTTP 1.0 Alternate Port:** TCP  
port 49152-65535 (not including  
54267)

### Network Name:

"webtemp\_xxxxx", where xxxxx is  
the device's serial number

**Max Number of Simultaneous  
HTTP Connections:** 3

**Max Number of Non-HTTP TCP  
Sockets:** 5

### Network Security

**Security Implementation:** IP  
address based session manager  
with username/password login for  
configuration and control  
transactions (data is not secured)

**Session Timeout:** 5 min with  
no activity

### Username/Password

**Encryption:** Base64 (the default  
web page does not support  
encryption if Javascript is disabled  
in the web browser)

**Vulnerabilities:** Denial of service  
attacks, username/password  
spoofing, script probing and  
simple decryption

## GENERAL

**Memory:** EEPROM (512 bytes for  
sensor configuration); FLASH (2 MB  
for device configuration and website  
storage)

**Microcontroller:** One 8-bit and  
one 16-bit RISC high-performance  
microcontroller

**Power Supply Voltage (Supplied  
by Included External Power  
Supply):** 5 Vdc  $\pm$ 5%

**Power Supply Current (Supplied  
by Included External Power  
Supply):** 440 mA maximum

**User Output Voltage (5V):**  
4.65V min to 5.25V maximum  
(10 mA maximum)

## Excitation Current for Resistance

**Sensors:** RTD, 210  $\mu$ A  $\pm$ 5% typ;  
thermistor, 10  $\mu$ A  $\pm$ 5% typ

### Dimensions:

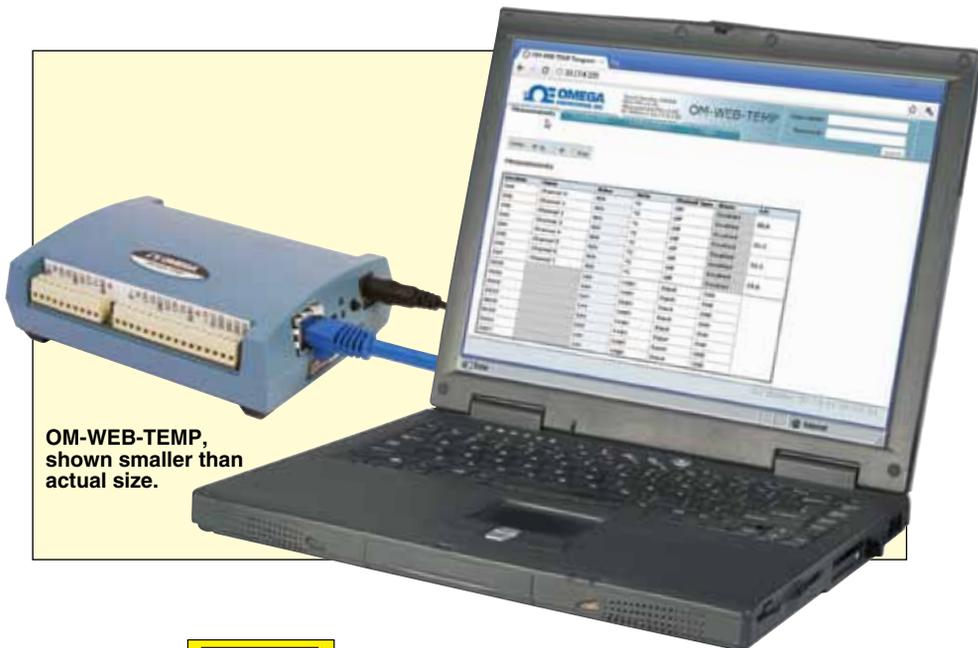
127 L x 89 W x 36 mm D  
(5.0 x 3.5 x 1.4")

**Input Connections:** Screw terminal  
blocks (accept 16 to 30 AWG wire)

**Operating Temperature:** 0 to 55°C  
(32 to 131°F), 0 to 90% RH  
non-condensing

**Storage Temperature:** -40 to 85°C  
(-40 to 185°F)

**Weight:** 160 g (5.6 oz)



OM-WEB-TEMP,  
shown smaller than  
actual size.

Laptop not included.



*OMEGACARE<sup>SM</sup> extended warranty  
program is available for models shown on  
this page. Ask your sales representative  
for full details when placing an order.  
OMEGACARE<sup>SM</sup> covers parts, labor and  
equivalent loaners.*

## To Order

Model No.	Description
OM-WEB-TEMP	8-channel web-enabled temperature measurement module
SWD-TRACERDAQ-PRO	TracerDAQ Pro software

*Comes complete with an ethernet cable, 100 to 240 Vac ac adaptor with USA plug, quick start guide, software and operator's manual on CD.*

**Ordering Example:** OM-WEB-TEMP, 8-channel web-enabled temperature measurement module and OCW-1 OMEGACARE<sup>SM</sup> 1 year extended warranty adds 1 year to standard 1 year warranty.