WebDAQ 316
Internet Enabled Thermocouple Logger

Remote Configuration and Monitoring
Virtually Unlimited Storage
Integrated HW and SW
Flexible Triggers, Alarms, Emails, and SMS Texts
Built-in Web Server, Easy-to-Use
WebDAQ 316
Internet Enabled Thermocouple Data Logger

The WebDAQ 316 intelligent logger features remote monitoring and control of real-time temperature data.

Overview
The WebDAQ 316 is a stand-alone, temperature logger designed for remote monitoring and control. All the intelligence is built into the WebDAQ, eliminating the need for a PC or additional software. By using the embedded WebDAQ web server, users can easily configure simple or sophisticated applications, log temperature data, update digital outputs and/or send notifications based on alarm conditions, and view real-time data from any location and any device with a web browser.

The WebDAQ 316 provides 16 isolated thermocouple inputs, and four isolated digital bits that can be used as trigger inputs or alarm outputs. Housed in a heavy-duty chassis, the WebDAQ 316 is rugged enough for industrial applications.

Features
- 16 thermocouple inputs
  - Isolated to 250 V
- Four isolated DIO for triggers and alarms
- Log data to internal storage or mapped network storage
- Share folders to view files over a local network
- Configurable read/write access
- Alarming and notifications with email and SMS messaging
- Export data to csv, UFF, or binary for other applications
- No driver software to install
- Built-in web server allows access from any device with a web browser
- Easy, flexible task scheduling
- Remote monitoring and control
- WiFi support

Integrated Software and Hardware
The WebDAQ Series embedded OS and web server provides an all-in-one package for stand-alone data logging and alarming. Users can monitor and control their applications from anywhere with a web browser.

The WebDAQ web server is optimized for both desktop and mobile use. Users can perform data acquisition tasks from phones, tablets and laptops with a single, intuitive user interface.

WebDAQ Web Interface
An embedded web server provides a clean, intuitive interface to access all configuration and data management tasks.

Hardware, trigger and alarm settings are contained in a single task, or "job". Multiple "jobs" can be run in a "schedule" for more complex data logging applications.

For example, users can create a schedule of jobs in which one job automatically runs after an alarm condition is triggered on a different job, such as when a temperature is reached or when a digital input changes.

Remote Access and Control
Install the WebDAQ 316 on any network and access it using any device with a web browser to remotely monitor and control all operations. Users can connect a WiFi adapter to the rear panel and communicate with the WebDAQ over a wireless network.

Flexible Triggering
Start or stop the acquisition based on analog or digital thresholds, alarm states, or date/time values. On-demand push button triggering is also supported.
Easy Setup – Powerful Capabilities

Jobs are the building block of WebDAQ. The ability to define different data logging jobs, or tasks, and add them to a schedule unleashes flexibility not seen in any other data logger.

Whether you want to set up a simple logging task or a complex task, jobs and a schedule make it easy and straightforward.

What is a Job?
The basic building block of WebDAQ, a job defines channel configuration, logging options, start and stop conditions, and alarming.

What is a Schedule?
A schedule is a collection of jobs that gives flexibility to dynamically change data logging attributes, such as sampling rate, active channels configuration, or alarm levels.

Example:
Switching from static acquisition to dynamic acquisition.

1 Schedule and 2 Jobs
Users can easily setup a job for a slow, static acquisition and a fast dynamic acquisition. When a trigger condition is met (i.e. over/under alarm), Job 1 (slow acquisition) ends and Job 2 (fast acquisition) begins. When the trigger condition returns to normal, job 1 can be restarted.

Clear, Concise, Data Displays
WebDAQ users don’t need to rely on the small screens and difficult to navigate displays of most other loggers. With WebDAQ’s intuitive web interface, users can easily see their data and alarm conditions in real time or after the acquisition is complete.
WebDAQ 316

Features

**Alarm and Event Notifications**
Create multiple alarms using analog or digital channel sources. Configure alarms to reset and re-arm when the condition clears, or reset them remotely with your browser. View the alarm status on the web interface. Receive event and alarm notifications on one or more addresses using email and SMS messaging.

**Virtually Unlimited Storage**
Store data files and configuration settings locally in internal flash memory, or save to external media or network folders.

Users can map a network drive or FTP server as the location to log data or store files.

Easily transfer files between WebDAQ storage locations and mapped network storage locations.

**Share Folders**
Users can share a WebDAQ storage location or specific folder over a local network.

**Real-Time Data Display**
View data as it is acquired or from a stored file. Users can specify a range of data to view and zoom in or out. Data is plotted on strip chart and scalar displays.

**Control Read and Write Access**
Users can control who can view and modify job settings by defining a password and setting the security level for the admin account. A “share” password can be used to access a shared folder or FTP server running on the WebDAQ.

**Run the Schedule on Startup**
Automatically run the schedule when the system starts up. Multiple jobs in the schedule are run consecutively.

**Real-Time Clock**
A real-time clock provides an absolute time reference for time-stamping data. The clock can be set to any timezone, and may be synchronized to the internet time server.

**Isolated Thermocouple Inputs**
The WebDAQ 316 provides up to 16 thermocouple channels. Thermocouple inputs are isolated from ground. Overvoltage protection is provided between any two inputs.

**CJC and Auto Zero Support**
Cold junction compensation (CJC) is enabled for all channels. Users can enable auto zero to compensate for offset errors.

**Isolated Digital I/O**
The four isolated digital I/O lines can be used either as triggers to start or stop the acquisition or as alarm outputs.

**Flexible Power Requirements**
Provide power with the 9 volt, 1.67 amp supply that ships with the device, or connect any 6 to 16 DC supply

**Firmware Updates**
Device firmware is bundled with the operating system and web server in one update file. This allows the WebDAQ 316 to be updated in the field.

**Calibration**
The WebDAQ 316 is factory-calibrated using a NIST-traceable calibration process. Specifications are guaranteed for one year. Return the device to the factory for recalibration.
WebDAQ 316

Front and Rear Panels

**Front Panel**
Detachable spring and screw terminals allow quick thermocouple and digital connections.

**Rear Panel**
The rear panel provides Ethernet and power connections, LED indicators, dual USB ports, one SD card slot, buttons, and a ground connector.
**WebDAQ 316**

**Specifications**

All specifications are subject to change without notice. Typical for 0 °C to 50 °C unless otherwise specified.

**Thermocouple input**

Number of channels: 16 thermocouple channels, 1 internal auto zero channel, 1 internal cold-junction compensation channel
ADC resolution: 24 bits
Type of ADC: Delta-Sigma
Sampling mode: Scanned
Voltage measurement range: ±78.125 mV
Temperature measurement ranges: Works over temperature ranges defined by NIST (J, K, T, E, N, B, R, S thermocouple types)

<table>
<thead>
<tr>
<th>Thermocouple Type</th>
<th>Accuracy Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>J</td>
<td>±0.002 °C typ, ±0.004 °C max</td>
</tr>
<tr>
<td>K</td>
<td>±0.002 °C typ, ±0.004 °C max</td>
</tr>
<tr>
<td>T</td>
<td>±0.002 °C typ, ±0.004 °C max</td>
</tr>
<tr>
<td>E</td>
<td>±0.002 °C typ, ±0.004 °C max</td>
</tr>
<tr>
<td>N</td>
<td>±0.002 °C typ, ±0.004 °C max</td>
</tr>
<tr>
<td>B</td>
<td>±0.002 °C typ, ±0.004 °C max</td>
</tr>
<tr>
<td>R</td>
<td>±0.002 °C typ, ±0.004 °C max</td>
</tr>
<tr>
<td>S</td>
<td>±0.002 °C typ, ±0.004 °C max</td>
</tr>
</tbody>
</table>

**DIAGRAMS OF EACH THERMOCOUPLE TYPE.** Refer to the chapter of the hardware user’s guide for accuracy error diagrams of each thermocouple type.

**Timing Mode**

<table>
<thead>
<tr>
<th>Requested Scan Rate</th>
<th>Mode</th>
<th>Conversion Time (per channel)</th>
<th>Sample Rate (all channels)</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤1 Hz</td>
<td>High-resolution</td>
<td>55 ms</td>
<td>1 S/s</td>
</tr>
<tr>
<td>&gt;1 Hz</td>
<td>High-speed</td>
<td>740 µs</td>
<td>75 S/s</td>
</tr>
</tbody>
</table>

*The timing mode is automatically set for either high-resolution or high-speed mode based on the requested scan rate, regardless of the number of channels.*

**Common-mode voltage range**

Channel-to-COM: ±1.2 V min, ±5.0 V max
COM-to-ground: ±250 V
Common-mode rejection ratio (CMRR) at 50 Hz:
- Channel-to-COM: 100 dB
- COM-to-ground: >170 dB
High-speed mode at 0 to 60 Hz:
- Channel-to-COM: 70 dB
- COM-to-ground: >150 dB

**Input characteristics**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Mode</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement sensitivity</td>
<td>High-resolution</td>
<td>Type J, K, T, E, N: &lt;0.02 °C</td>
</tr>
<tr>
<td></td>
<td>High-speed</td>
<td>Type B, R, S: &lt;0.15 °C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Type J, K, T, E: &lt;0.25 °C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Type N: &lt;0.35 °C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Type R: &lt;2.8 °C</td>
</tr>
</tbody>
</table>

Refer to the Specifications chapter of the hardware user’s guide for accuracy error diagrams of each thermocouple type.

**Digital input/output**

Digital type: CMOS (Schmitt trigger) input / open drain output
Number of I/O: One port of 4 bits
Configuration: Bit configurable for input or output
Power on conditions: Power on reset is input mode
Pull-up configuration: Each bit is pulled up to 5 V with a 10 kΩ resistor
Input frequency range: DC – 10 kHz
Input high voltage threshold: 1.9 V min, 3.6 V max
Input low voltage threshold: 2.3 V max, 1.0 V min
Schmitt trigger hysteresis: 0.6 V min, 1.7 V max
Input high voltage limit: 15 V absolute max
Input low voltage limit: -0.5 V absolute min, 0 V recommended
Output off state leakage current: 10 µA max
Output sink current capability: 100 mA max (continuous) per output pin
Output transistor on-resistance (drain to source): 1.6 Ω

**Network**

Ethernet type: 100 Base-TX, 10 Base-T
Communication rates: 10/100 Mbps, auto-negotiated
Connector: RJ-45, 8 position
Cable length: 100 meters (328 feet) max

**Factory default settings**

Factory default IP address: 192.168.0.101
Factory default subnet mask: 255.255.255.0
Factory default Gateway: 192.168.0.1
Factory default DHCP setting: DHCP + link-local enabled
Factory default password for admin account: admin. Passwords are case sensitive and can be changed using the web interface.
Factory default password for share account: share. Passwords are case sensitive and can be changed using the web interface.
Factory default device name: webdaq-xxxxx, where xxxxxx is the last 6 digits of the MAC address (printed on the label on the underside of the device).
Note: When factory defaults are restored, any shared folders or mapped drives are reset.

**USB ports**

Number of USB ports: Two, for connection to a mass storage device or approved Wi-Fi adapter
USB device type: USB 2.0 (high-speed)
Device compatibility: USB 1.1, USB 2.0, USB 3.0

**SD memory card slot**

Memory card type: SD, SDHC, SDXC, MMC, TransFlash
File systems supported: FAT16, FAT32, exFAT, ext2/3/4, NTFS

**Push buttons**

Power (POWER): W1 jumper installed (factory default): Turns device on or off
W1 jumper removed (device on when power is applied): Reboots the device.
Function (FUNC): Unmounts external media, or starts/stops an acquisition
Reset (CONFIG RESET): Restores network and alarm settings to factory default values.

**Power**

Input voltage: Center positive. 6 VDC to 16 VDC
Input wattage: 4 W typ, 10 W max
External AC adapter: 9 VDC, 1.67 amps, 110 VAC to 240 VAC input range
Battery: One 3 V button cell lithium battery (BR1225 or CR1225); replaceable
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Ordering

**Mechanical**
Dimensions (L × W × H): 158.8 × 146.1 × 38.1 mm (6.25 × 5.75 × 1.50 in.)
With spring terminal: 177.0 × 146.1 × 38.1 mm (6.97 × 5.75 × 1.50 in.)
Weight: 635 g (1.45 lb)

**Environmental**
Operating temperature range: 0 °C to 50 °C max
Storage temperature range: −40 °C to 85 °C
Ingress protection: IP 30
Humidity: 10-90% RH, noncondensing (Operating), 5-95% RH (Storage)
Maximum altitude: 2,000 m (6,562 ft)
Pollution Degree: 2

The WebDAQ 316 is intended for indoor use only, but may be used outdoors if installed in a suitable enclosure.

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**Order Information**

**Hardware**

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WebDAQ 316</td>
<td>Internet enabled data logger with 16 thermocouple inputs and 4 DIO lines, embedded operating system and web server; includes the PS-9V1AEP5230V power supply with USA, UK, and Europe plugs.</td>
</tr>
</tbody>
</table>

**Accessories**

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC-205</td>
<td>DIN-rail mounting kit; requires the ACC-404 panel/wall mounting kit.</td>
</tr>
<tr>
<td>ACC-402</td>
<td>36-position detachable spring terminal.</td>
</tr>
<tr>
<td>ACC-403</td>
<td>6-position detachable screw terminal (2).</td>
</tr>
<tr>
<td>ACC-404</td>
<td>Panel/wall mounting kit; use with the ACC-205 to mount on a DIN rail.</td>
</tr>
<tr>
<td>PS-9V1AEP5230V</td>
<td>9 VDC, 1.67 A replacement power supply. Interchangeable power plugs are available separately.</td>
</tr>
</tbody>
</table>