MEASUREMENT COMPUTING™

WebDAQ 504

Internet Enabled Vibration/Acoustic Logger from MCC

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 504

Internet Enabled Vibration/Acoustic Logger

The WebDAQ 504 intelligent logger features remote monitoring and control of real-time acoustic and vibration data.

Overview

The WebDAQ 504 is a stand-alone, acoustic and vibration 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 vibration 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 504 performs high-accuracy measurements from up to four IEPE sensors. Housed in a heavy-duty chassis, the WebDAQ 504 is rugged enough for industrial applications such as noise and vibration testing.

Features

- Four simultaneous analog inputs
  - AC/DC coupling
  - IEPE excitation current
- Real-time FFTs for continuous monitoring and analysis
- Four isolated DIO for triggers and alarms
- No driver software to install
- Virtually unlimited storage
- Built-in web server allows access from any device with a web browser
- Easy, flexible task scheduling
- Remote monitoring and control
- Alarming and notifications with email and SMS messaging
- Configurable read/write access
- Ability to export .csv data for Excel® and MATLAB®

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 digital input changes.

Remote Access and Control

Install the WebDAQ 504 on any network and access it using any device with a web browser to remotely monitor and control all operations.

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.

Device-independent operation lets you remotely monitor and control the WebDAQ 504 from any device with a web browser.

WebDAQ 504

Introduction

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.

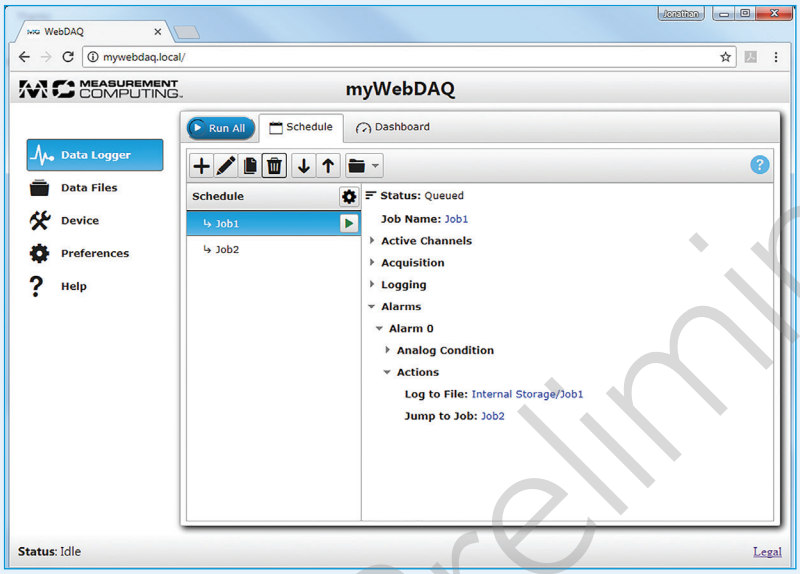
Whether you want to set up a simple logging task or a complex task, jobs and a schedule make it easy and straightforward.

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:

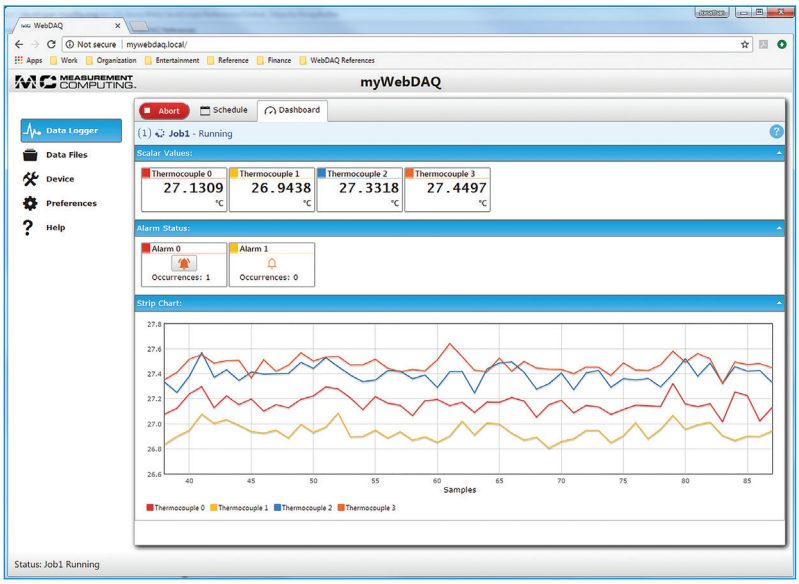
Switching from static acquisition to dynamic acquisition.

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 504

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 and configuration settings locally in internal flash memory, or save to a USB mass storage device or SD card. Easily transfer files between remote and local locations. View available space for each storage location at any time.

Real-Time Data Display

View data as it is acquired or from a stored file. Users can specify a range of data to view. Data is plotted on strip chart and scalar displays. Real-time FFTs allow continuous monitoring and analysis.

Control Read and Write Access

Users can control who can view and modify job settings by defining a password and setting the security level.

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.

Simultaneous Vibration Measurements

Users can perform simultaneous measurements from four IEPE sensors at rates up to 51.2 kS/s per channel. The WebDAQ 504 provides 102 dB dynamic range and signal conditioning at 2 mA constant current.

AC/DC Coupling

Using software, users can configure each channel for AC or DC coupling, and enable IEPE excitation current for AC coupling.

Anti-alias Filtering

Built-in anti-alias filters automatically adjust to the sampling rate. Analog and digital filtering accurately represents in-band and out-of-band signals. Signals within the passband have frequency-dependent gain, A stopband filter attenuates all signals above the stopband frequency.

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

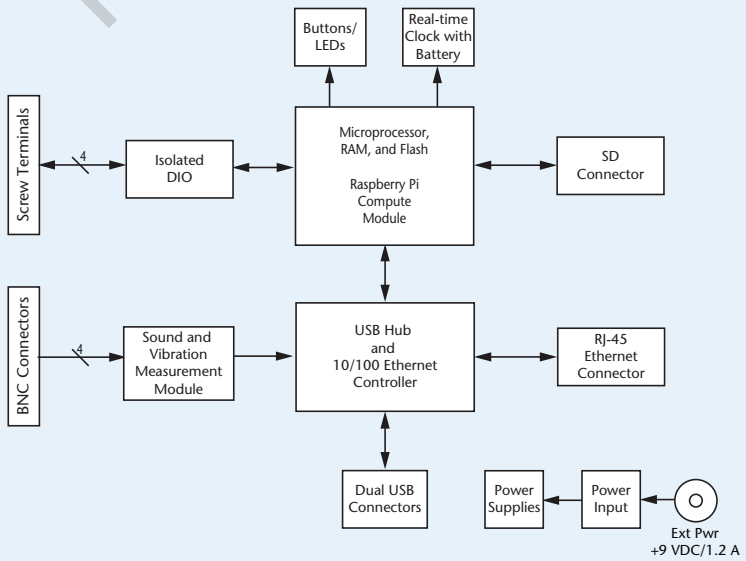
Provide power with the 9 volt, 1.67 amp supply that ships with the device, or connect any 6 to 16 DC supply to the WebDAQ 504.

Firmware Updates

Device firmware is bundled with the operating system and web server in one update file. This allows the WebDAQ 504 to be updated in the field.

Calibration

The WebDAQ 504 is factory-calibrated using a NIST-traceable calibration process. Specifications are guaranteed for one year. Return the device to the factory for recalibration.



WebDAQ 504

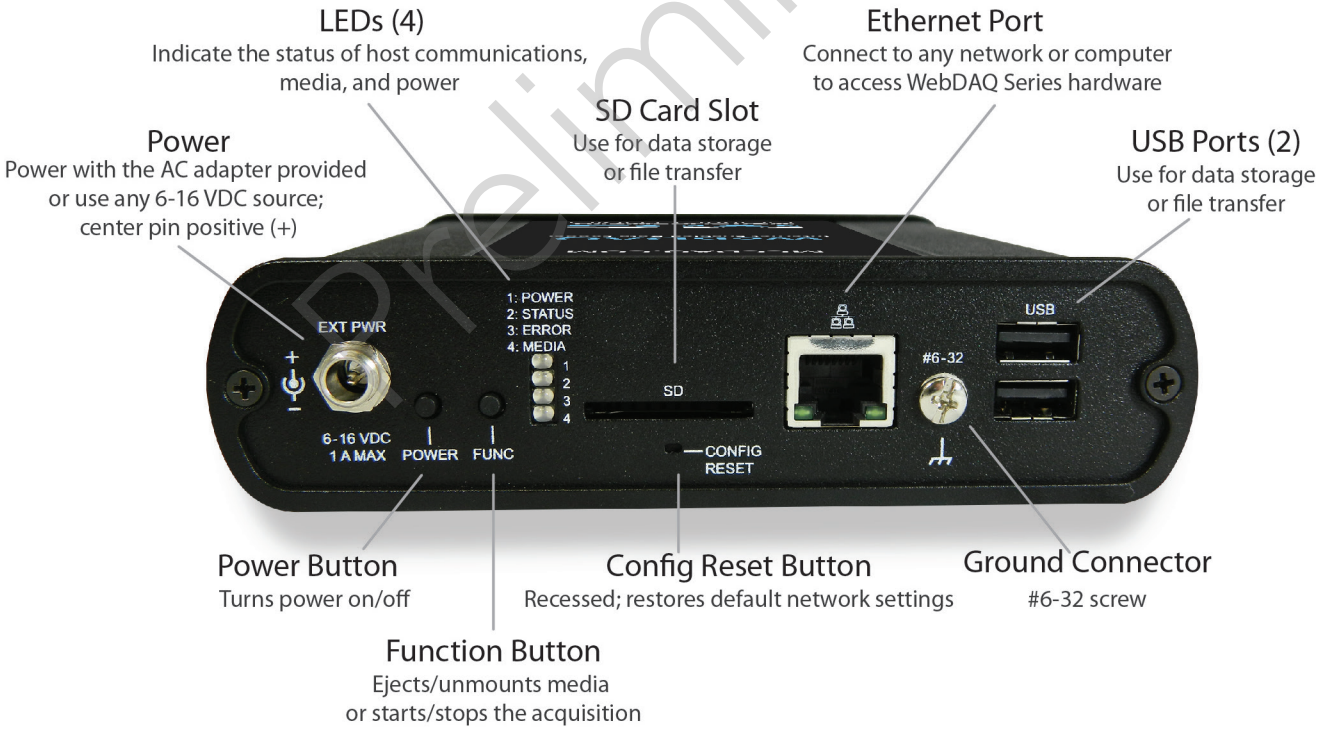
Diagrams

Front Panel

BNC connectors and detachable screw terminals allow quick sensor 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.



Specifications

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

Analog Input

Number of channels: 4 analog input channels
ADC resolution: 24 bits
Type of ADC: Delta-Sigma (with analog prefiltering)
Sampling mode: Simultaneous
Internal master timebase (f_M)
  Frequency: 13.1072 MHz
  Accuracy: ±50 ppm max
Data rate range (f_s): 1.652 kS/s min, 51.2 kS/s max. The data rate must remain within the appropriate data range.
Data rates (f_s): (f_M ÷ 256)/n, where n = 1, 2, ..., 31.
Input coupling: AC/DC, software-selectable
AC cutoff frequency
  –3 dB: 0.5 Hz
  –0.1 dB: 4.6 Hz max
Input range: ±5 V
AC voltage full-scale range: ±5 Vpk min, ±5.1 Vpk typ, ±5.2 Vpk max
Common-mode voltage range, AI- to earth ground: ±2 V max
IEPE excitation current; software selectable on/off: 2.0 mA min, 2.1 mA typ
Power-on glitch: 90 µA for 10 µs
IEPE compliance voltage: 19 V max
Overvoltage protection, with respect to chassis ground
  Signal source connected to AI+ and AI–:±30 V
  Low-impedance source connected to AI+ and AI–: –6 V to 30 V
Input delay: (40 + 5/512)/fs + 2.6 µs
Gain drift: 0.14 mdB/°C (16 ppm/°C) typ, 0.45 mdB/°C (52 ppm/°C) max
Offset drift: 19.2 µV/°C typ, 118 µV/°C max
Channel-to-channel matching
  Phase (f_{in} in kHz): f_{in} × 0.045° + 0.04 max
  Gain 0.01: dB typ, 0.04 dB max
Passband
  Frequency: 0.45 × fs
  Flatness (f_s = 51.2 kS/s): ±40 mdB (pk-to-pk max)
Phase nonlinearity, f_s = 51.2 kS/s: ±0.45° max
Stopband
  Frequency: 0.55 × f_s
  Rejection: 100 dB
Alias-free bandwidth: 0.45 × f_s
Oversample rate: 64 × f_s
Crosstalk (1 kHz): –110 dB
CMRR, f_{in} ≤ 1 kHz, 40 dB min: 47 dB typ
SFDR, f_{in} = 1 kHz, –60 dBFS: 120 dB
Input impedance
  Differential: 305 kΩ
  AI– (shield) to chassis ground: 50 Ω

Measurement Accuracy			
Measurement Conditions		% Reading (Gain Error)	% Reading (Offset Error)[1]
Calibrated	0 °C to 50 °C max	0.34%, ±0.03 dB	±0.14%, 7.1 mV
	25 °C ±5 °C typ	0.05%, ±0.005 dB	±0.006%, 0.3 mV
Uncalibrated[2]	0 °C to 50 °C max	1.9%, ±0.16 dB	±0.27%, 13.9 mV
	25 °C ±5 °C typ	0.48%, ±0.04 dB	±0.04%, 2.3 mV

[1] Range = 5.1 Vpk.
[2] Uncalibrated accuracy refers to accuracy achieved in raw or unscaled modes where the calibration constants stored in the device are not applied to the data.

Idle Channel and Noise Density			
Idle Channel	51.2 kS/s	25.6 kS/s	2.048 kS/s
Noise	97 dBFS	99 dBFS	103 dBFS
	50 μV_{rms}	40 μV_{rms}	25 μV_{rms}
Noise density	310 nV/√Hz	350 nV/√Hz	780 nV/√Hz

Total Harmonic Distortion (THD)		
Input Amplitude	Condition	Specification
Input amplitude	–1 dBFS	1 kHz: –95 dB 8 kHz: –87 dB
	–20 dBFS	1 kHz: –95 dB 8 kHz: –80 dB
Intermodulation distortion (–1 dBFS)	DIN 250 Hz/8 kHz 4:1 amplitude ratio	–80 dB
	CCIF 11 kHz/12 kHz 1:1 amplitude ratio	–93 dB

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 100 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 min
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

Network interface

Network IP configuration: DHCP, link-local, static
  DHCP may be disabled by the user and a static IP address assigned
  If DHCP is enabled but is unsuccessful at obtaining an IP address the device will fall back to link-local and request the IP address 169.254.100.100.
Network name: webdaq-xxxxxx (default); xxxxxx are the lower 6 digits of the device MAC address; editable with the web interface.
Network name publication: By mDNS

Network 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: *admin*, case sensitive; editable with the web interface
Factory default user name: *admin*, case sensitive; cannot be changed.

USB ports

Number of USB ports: Two, for connection to a mass storage device or similar
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): Turns the device on or off, or forces the device to power off
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, 1.2 amps, 110 VAC to 240 VAC input range
Battery: One 3 V button cell lithium battery (BR1225 or CR1225); replaceable

Shock
Operating shock: 30 g, 11 ms half sine; 18 shocks at 6 orientations

Mechanical
Dimensions (L × W × H): 158.8 × 146.1 × 38.1 mm (6.25 × 5.75 × 1.50 in.)
With BNC connectors: 178.8 × 146.1 × 38.1 mm (7.04 × 5.75 × 1.50 in.)
Weight: 635 g (1.45 lb)

Environmental
Temperature range: 0 °C to 50 °C max operating, –40 °C to 85 °C storage
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 504 is intended for indoor use only but may be used outdoors if installed in a suitable enclosure.

Order Information

Hardware

Part No.	Description
WebDAQ 504	Internet enabled vibration and acoustic logger with four analog inputs, simultaneous sampling, and IEPE signal conditioning; includes the PS-9V1AEPS230V power supply with USA, UK, and Europe plugs.

Accessories

Part No.	Description
ACC-205	DIN-rail mounting kit; requires the ACC-404 panel/ wall mounting kit.
ACC-403	6-position detachable screw terminal (2).
ACC-404*	Panel/wall mounting kit; use with the ACC-205 to mount on a DIN rail.
PS-9V1AEPS230V	9 VDC, 1.67 A replacement power supply. Interchangeable power plugs are available separately.

* Coming soon