



SMT Research received the NRC-IRAP 2007 New Technology Award for the WiDAQ.

Mobile Wireless Data Acquisition Node

General Description

The Mobile Wireless Data Acquisition Node (WiDAQ) is a high precision measurement device designed for distributed remote sensor data acquisition. The built-in 24-bit A/D converter and low noise high precision measurement circuitry facilitates data acquisition from a wide variety of sensors.

The Mobile WiDAQ communicates directly to the SMT Building Intelligence gateway or via a CAN coordinator when used in a hybrid wireless/wired configuration. This configuration offers several benefits over a wireless only system as wired nodes act as coordinators for wireless nodes allowing Mobile WiDAQs to conserve battery power.

Applications

- Restoration Monitoring
- Building Science Research (short term)
- Targeted repair monitoring
- Mobile remote data acquisition

See the Industrial WiDAQ datasheet for long term monitoring and custom applications.

Features

- Four resistance channels capable of reading wide moisture content ranges and precision thermistors.
- Sensor inputs use compact audio jacks for quick and simple connectivity.
- Resistance measurements performed in positive and negative polarity for the purpose of negating half cell voltages and diode effects in the monitored structure.
- Each input is optically isolated from each other and earth ground preventing ground loops and external noise influences on the measurement.
- Integrated relative humidity and temperature sensor.
- Internal 1Mbit EEPROM used for data logging.
- Auxiliary input for voltage measurement capable of reading 0-5V sensors such as external RH sensors.
- Communicates to SMT Building Intelligence Gateway (BiG) via USB WiKey, iCAN or wired CAN clusterhead device.
- Easy accessible standard 9V battery.



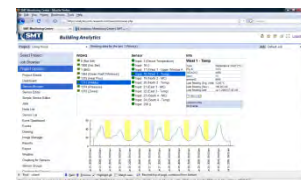
Sensors
(PMM, Tape etc)



Data Acquisition
(Mobile WiDAQ)



Gateway (BiG)



Internet (Analytics)

Performance/Functional Specifications
Communication Electrical/Performance
Wireless

Specification	IEEE 802.15.4
Max Distance from coordinator	30m (with included antenna, extended ranges up to 350m available with optional external antennas)
Max Nodes per coordinator	32 (depends on application density and acquisition speed)
Battery Life	1000 hours (depends on sample frequency)
Memory	1Mbit EEPROM for data storage Stores 13800 32-bit datapoints with timestamp.

Environmental

Operating Temperature	0° to 40°C / 32° to 104°F
Storage Temperature	-25° to 70°C / -13° to 158°F
Humidity	5% to 90% RH non-condensing
Electrostatic Discharge (ESD)	8kVdc air, 4 kVDC contact (exposed inputs)

Mechanical
Standard Enclosure

Dimensions	147mm (L) x 89 mm (W) x 24mm(H)
Weight	200g

Connections

AUX Port	5V, GND, Vin
MC/T1	Resistance 100Ω to 1GΩ
MC/T2	Resistance 100Ω to 1GΩ

Interface

LEDs	Red/Green LEDs
Button	Power/Config Button

Safety

Safety Requirements	9V SELV Separated Extra Low Voltage
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Measurement Electrical/Performance
Internal Temperature – Input 2

Sensor	Panasonic ERT-J1VS104FA Beta 4390K
Range	-40°C to +70°C
Resolution	0.1°C
Accuracy	±1°C

External Relative Humidity (AUX port) – Input 5

Sensor	Humeril HTM2500
Accuracy Range	10-95% RH
Resolution	±0.4%
Accuracy	±3%

Internal Relative Humidity – Input 6

Sensor	Humeril HTM1735
Accuracy Range	10-95% RH
Resolution	±0.4%
Accuracy	±3%

Resistance – Input 17, 18, 19 and 20

Range	100Ω to 1KΩ
Resolution	10Ω
Accuracy	±5%

Range	1KΩ to 10KΩ
Resolution	100Ω
Accuracy	±5%

Range	10KΩ to 100KΩ
Resolution	1KΩ
Accuracy	±5%

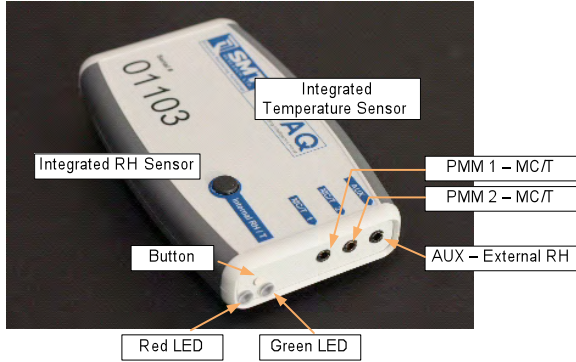
Range	100KΩ to 1MΩ
Resolution	10KΩ
Accuracy	±5%

Range	1MΩ to 10MΩ
Resolution	100KΩ
Accuracy	±5%

Range	10MΩ to 100MΩ
Resolution	1MΩ
Accuracy	±10%

Range	100MΩ to 1GΩ
Resolution	10MΩ
Accuracy	±10%

Specifications are subject to change without notice



Internal Sensors

Humidity and temperature sensors are integrated in the WiDAQ as well as battery voltage and wireless RSSI signal strength monitors.

Sensor Connectivity

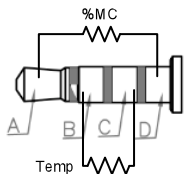
See the sensor datasheets for specifications and installation options for the sensors listed below.



Plug sensor audio jacks into WiDAQ ports



PMM Sensor
Plug PMM-02 sensor into MC/T 1 and/or MC/T 2 port.



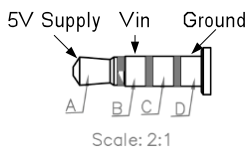
MC/T Ports
MC/T 1 and MC/T 2 reference the audio jack as shown.



Thermistor 104JT-01
Plug the 104JT-01 Thermistor into the MC/T 1 and/or MC/T2 port



HTM2500-01 Relative Humidity
Plug the HTM2500-01 Sensor into the AUX port.



Auxiliary Ports
Plug 0-5V Sensors into AUX port

Push Button/LED Interface

(Software version 2.02 and higher)

Action	Result
Turn ON/OFF	Press button twice ON – Green Flashes OFF – Red Flashes
Force Reading	Press button once Blink Green followed by communication status: Solid Green – Taking Reading Solid Red – Failed communication
State	Result
Powered ON	Green – Taking Reading Red – Failed communication
Powered OFF	Press button once Red – Unit OFF

BiG Sensor Input Configuration

WiDAQ inputs show up as Autonomous nodes with default values in resistance (ohms) or voltage (mV) depending on the sensor. Select the appropriate sensor type to have the converted units displayed.

WiDAQ Input	Input	Sensor Type
Internal Device Temperature	2	Temperature 104JT (ohms)
External Aux Sensor	5	Default (µV) change to specific sensor type
Internal RH	6	HTM2500
RSSI	15	RSSI (radio strength)
Battery Voltage	16	Default (mV)
T1	17	Temperature 104JT (ohms)
MC1	18	Moisture (ohms)
T2	19	Temperature 104JT (ohms)
MC2	20	Moisture (ohms)

Data collection and analysis

Data from the WiDAQs is collected by the *Building Intelligence Gateway* (BiG) and forwarded to the *Building Analytics* server database for further analysis and user access. See the BiG and Analytics user manuals for sensor configuration and data analysis capabilities.

Ordering Information

Mobile WiDAQ	WiDAQ-011-420-E
Mobile WiDAQ w/ external antenna	WiDAQ-011-420-EL
External RH Sensor	HTM2500-01-006
Point Moisture Measurement w/ thermistor	PMM-02-006
Thermistor	104JT-01-006
9V Battery	9VBAT