

MultiScan™ 48R

48 Channel Data Acquisition Controller

General Description

The MultiScan™48R is a 48 channel resistance measurement device that uses a 48 channel input matrix interfaced to an SMT WiDAQ unit.

The WiDAQ 24-bit A/D converter and low noise high precision measurement circuitry facilitates data acquisition from a wide variety of resistance based sensors used for a variety of applications from conventional roof monitoring to dense sensor deployments in test labs.

Applications

Roof Monitoring

- Conventional roof moisture monitoring

Flood Monitoring

- Interstitial spaces and/or mass input monitoring solutions

Building Science Research

- Test huts/labs requiring dense sensor deployments

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

Features

- 48 resistance channels capable of reading wide moisture content ranges.
- Sensor inputs use quick punch Bix terminations for fast, secure and dense sensor deployments.
- Synchronizes with SMT Building Intelligence Gateway (BiG) or Tactical Intelligence Gateway (TiG) via a USB wired CANKey device.
- ABS, PVC, or Metal custom mountings & enclosures
- Low profile & low voltage hardware
- The controller has the ability to power the entire network through CAN or other external power sources as required.
- Portable Gateway, CAN, and Acquisition units are used during protracted roofing installations to validate night seals and construction related moisture levels within the assembly, long before final power and internet has been provided, exporting the data to Analytics for review and site repair as may or may not be needed.
- Resistance measurements can be performed in either positive or negative polarity for the purpose of negating half cell voltages or diode effects in monitored structures.
- Inputs are optically isolated from each other preventing external electrical noise influences.

Performance/Functional Specifications

Communication Electrical/Performance

Wired CAN

Max Distance	1000m 22 AWG control wire
Max Nodes	128 nodes
CAN Interface	CAN 2.0B (ISO 11898)
CAN Speed	10kbps
Input Power	6VDC to 12VDC

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)
Induced AC	Maximum 2VAC induced on sensor lines.

Mechanical

Standard Enclosure

Dimensions	12" x 12" x 2"
Weight	200g
<u>Interface</u>	
LEDs	Red/Green LEDs
Button	Power/Config Button

Safety

Safety Requirements	12V SELV Separated Extra Low Voltage. See CAN power supply for cULus rating.
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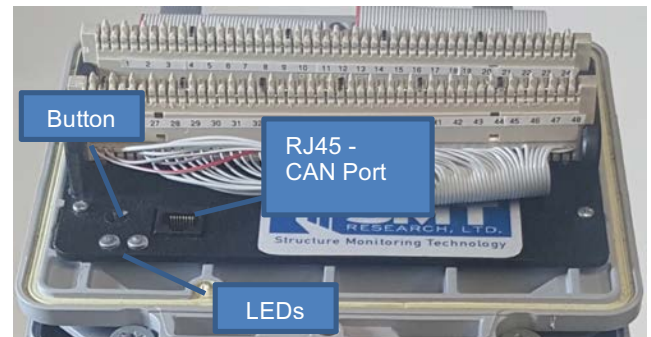
Specifications are subject to change without notice

Measurement Electrical/Performance

Resistance – Inputs 1-48

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%

Button/LED Interface

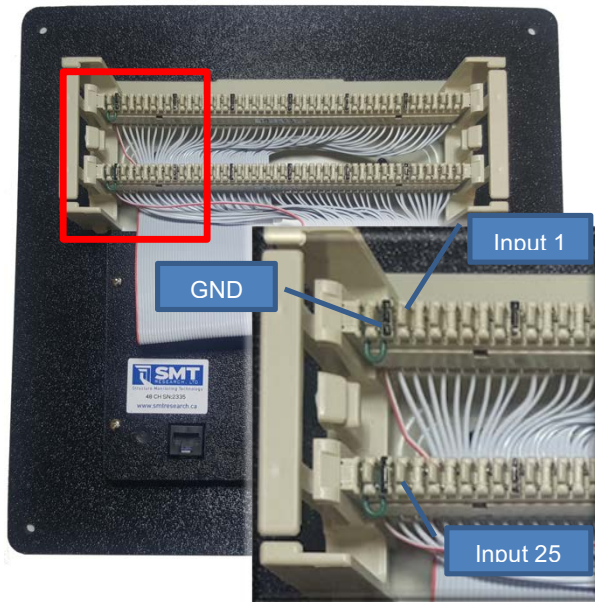


Action	Result
Turn ON/OFF	Press button twice ON – Green Flashes OFF – Red Flashes
Force Reading	Press button once Blink Green followed by communication status: Green – Taking Reading Red – Failed communication

MultiScan 48R Connections

Connect the single pair sensor wire to Input 1 on the 1A4 distribution connector or bix wafer. The upper connector consists of inputs 1 to 24 and the bottom connector consists of inputs 25 to 48.

Black hash marks on the wafer indicate groups of 4. The first input pair is reserved for ground and is unused on the resistance board. A wire will be pre-inserted in this to indicate that it is reserved.

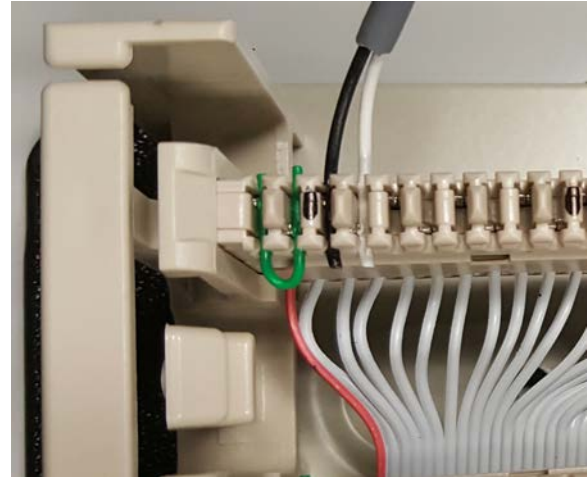


Using a bix punch tool, punch the wires onto the bix connector as shown. For resistance measurements polarity isn't important, however it is good practice to insert the black wire on the left and white on the right.



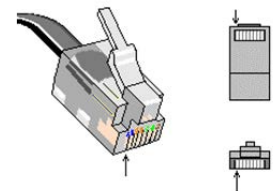
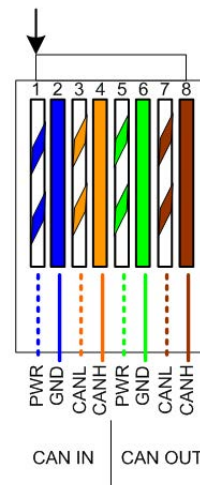
Some bix punch tools have an integrated knife so that it can trim the wires as they are inserted. Ensure the blade is on the correct side if the blade is set to cut

A completed connection for Input 1 is shown below. Wires should be a maximum of 22 AWG and can be stranded or solid core. Do not strip the wires, the connection relies on the wire jacket to hold it in position.



Wired CAN Connection

The CAN (Controller Area Network) port is located on the bottom left corner of the unit. CAN wiring is shown below (note this is different than standard Ethernet wiring). Daisy chain additional MultiScan units using the CAN IN and CAN OUT pin out as specified below. Refer to the CANKey manual for details on troubleshooting the CAN network and terminating the bus.

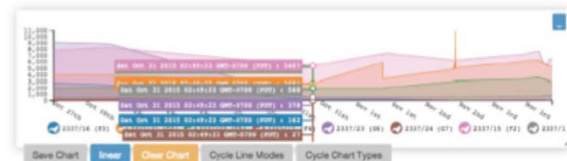
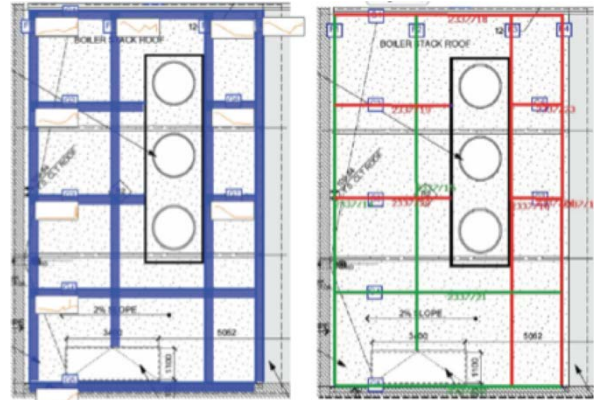
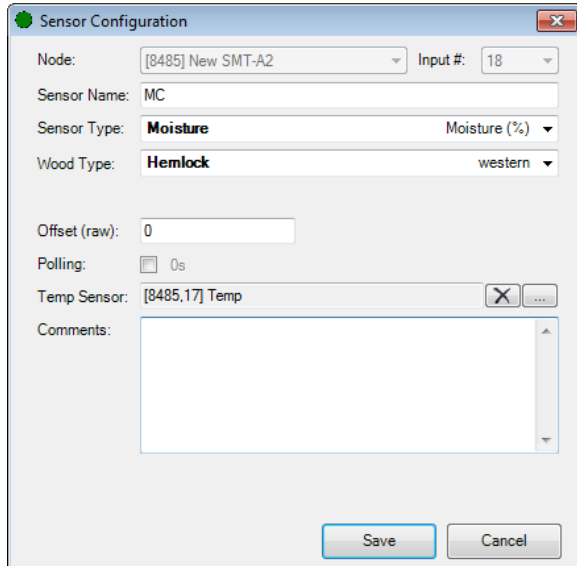


Arrow indicates pin 1

RJ45 Connector

Sensor Input Configuration

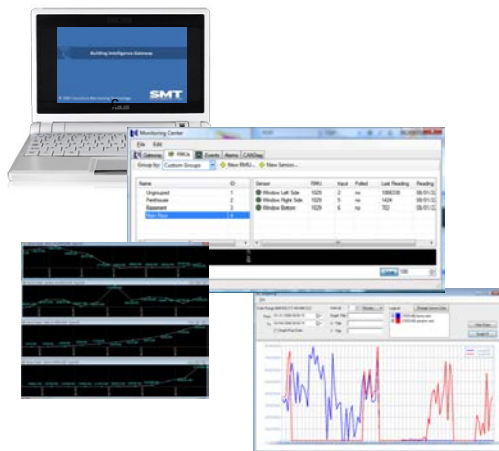
MultiScan inputs appear as Autonomous nodes with default values in resistance (ohms). Select the appropriate sensor type and wood type (if applicable) to have the converted units displayed. For moisture content applications include a temperature sensor for compensation as shown below.



Leaks are represented as 'Red' lines on the drawings associated with each roof deck. As conditions change the color and resultant moisture level of each sensor line will be adjusted.

Data collection and analysis

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



Ordering Information

Part Number	Description
MSR-48R-100	Data Acquisition Unit: MultiScan, 48channel Resistance
MSR-48R-220	Data Acquisition Unit: MultiScan, 48Channel Resistance, Bix Frame Mounting in ABS Plastic
MSR-48R-240	Data Acquisition Unit: MultiScan, 48Channel Resistance, Bix Frame Mount in Junction Box on 4" Menzie Stack
BIX-01-100	BIX: Frame (double bay)
BIX-02-110	BIX: Wafer (Ribbon Cable Pre-Woven)
BIX-03-130	BIX: Hand Punch Tool