

## Find the Right Bullhorn for Your Test Points



Click for Detailed Specifications:

**RM4210**







**RM4211**

**RM4250**

**RM4251**

**RM540**

**RM520**

	RM4210	RM4211	RM4250	RM4251	RM540	RM520
Application	AC Monitoring	Test Point & Bonds	AC Monitoring	Test Point & Bonds	Test Point	Bonds
Analog Channels	5	3	5	3	2	3
Digital Channels	0	0	0	0	0	0
Typical Measurements	<ul style="list-style-type: none"> <li>✓ AC Current Density</li> <li>✓ DC Current Density</li> <li>✓ Pipe-to-Soil</li> <li>✓ Drain Current</li> <li>✓ IR Free Instant Off</li> </ul>	<ul style="list-style-type: none"> <li>✓ Pipe-to-Soil</li> <li>✓ Bond Negatives</li> <li>✓ IR Free Instant Off</li> </ul>	<ul style="list-style-type: none"> <li>✓ AC Current Density</li> <li>✓ DC Current Density</li> <li>✓ Pipe-to-Soil</li> <li>✓ Drain Current</li> <li>✓ IR Free Instant Off</li> </ul>	<ul style="list-style-type: none"> <li>✓ Pipe-to-Soil</li> <li>✓ Bond Negatives</li> <li>✓ IR Free Instant Off</li> </ul>	<ul style="list-style-type: none"> <li>✓ Pipe-to-Soil</li> <li>✓ Bond Negatives</li> <li>✓ IR Free Instant Off</li> </ul>	<ul style="list-style-type: none"> <li>✓ Pipe-to-Soil</li> <li>✓ Bond Negatives</li> <li>✓ IR Free Instant Off</li> <li>✓ Bond Current</li> </ul>
Interruption	Yes (Coupon)	Yes (Coupon)	Yes (Coupon)	Yes (Coupon)	No (Interruption Aware)	Yes (Bond)
Communication	Two-Way Satellite	Two-Way Satellite	Two-Way Cellular	Two-Way Cellular	Two-Way RM540C: Cellular RM540S: Satellite	Two-Way RM520C: Cellular RM520S: Satellite
Mounting	<ul style="list-style-type: none"> <li>✓ Test Head</li> <li>✓ Flat-Base</li> </ul>	<ul style="list-style-type: none"> <li>✓ Test Head</li> <li>✓ Flat-Base</li> </ul>	<ul style="list-style-type: none"> <li>✓ Test Head</li> <li>✓ Flat-Base</li> </ul>	<ul style="list-style-type: none"> <li>✓ Test Head</li> <li>✓ Flat-Base</li> </ul>	<ul style="list-style-type: none"> <li>✓ Test Head</li> <li>✓ Below Grade Housing (RM540C Only)</li> </ul>	<ul style="list-style-type: none"> <li>✓ Test Head</li> </ul>
Surge Immunity	In-circuit Protection	In-circuit Protection	In-circuit Protection	In-circuit Protection	In-circuit Protection	In-circuit Protection
Power Source	Battery	Battery	Battery	Battery	Battery	Battery
Backup Power	Solar	Solar	Solar	Solar	No	No
Warranty	Standard	Standard	Standard	Standard	3 Year All Inclusive	3 Year All Inclusive
Download Datasheet						

## INPUTS

<b>Readings:</b>	AC current density, DC current density, AC pipe-to-soil, DC pipe-to-soil, PCR AC current drain or voltage, instant off
<b>DC Voltage Range:</b>	±100 V
<b>AC Voltage Range:</b>	0 - 100 V
<b>AC Current Range:</b>	0 - 200 mA
<b>Input Impedance</b>	10 MΩ
<b>Channel-to-channel isolation</b>	≥ 200 V DC

## INSTANT OFF

<b>IR Drop Edge Delay:</b>	IR drop edge delay: 200 ms
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## CONFIGURATION

<b>Bullhorn Tools Mobile</b>	via Bluetooth Low Energy
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## SOFTWARE INTERFACE

**Bullhorn Web**

**Bullhorn Tools for IOS and Andriod**

## COMMUNICATIONS

<b>Satellite:</b>	IsatData Pro Satellite (Inmarsat)
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## POWER SUPPLY

Internal, field-replaceable primary and secondary batteries

3-7 year life when recording measurements hourly or daily with weekly transmissions

Additional solar or DC input voltage: 10-24 V DC

## DIMENSIONS

<b>RM4210</b>	Ø 6.06" x 3.96" H (8.22" H with test station adapter)
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## DATA INTEGRITY

Data stored in nonvolatile (EEPROM) memory

Queued two-way communication (communication to the RMU is queued in Bullhorn Web and is sent the next time the unit wakes up to transmit)

## ENVIRONMENTAL SPECS

<b>Temperature</b>	-30° C to +60° C
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## SAFETY AND COMPLIANCE

<b>Certification Mark</b>	TUV
<b>Tested Safety Standards</b>	CAN/CSA C22.2 No. 61010-1-2012 CAN/CSA C22.2 No. 61010-2-030:2012 UL61010-1:2012 UL61010-2-030:2012

## INPUTS

**Readings:** Three analog measurements; any combination of AC & DC pipe-to-soil, On and Off Potentials, Rectifier Volts and Amps (with external shunt), and Bond Negatives. Instant off through Coupon. One percent reading accuracy through the range with auto-calibration and auto-zero for every measurement. 1 mV measurement will be accurate within  $\pm 10$  microvolts

**DC Voltage Range:**  $\pm 100$  V

**AC Voltage Range** 0-100 V

**Input Impedance** 10 M $\Omega$

**Channel-to-channel isolation**  $\geq 200$  V DC

## INSTANT OFF

**IR Drop Edge Delay** Configurable IR drop edge delay: 200 ms default

**Logic Levels** minimum Logic 1 = 2 V; maximum Logic 0 = 800 mV

**Scan Rate** 16 scans per second

**Accumulator maximum cycle rate:** 1 cycle/2 s

**Minimum state change period:** 1 s

**Minimum pulse width:** 250 ms

## CONFIGURATION

**Bullhorn Tools** via Bluetooth Low Energy

## SOFTWARE INTERFACE

**Bullhorn Web**

**Bullhorn Tools for IOS and Andriod**

## COMMUNICATIONS

**Satellite** IsatData Pro (Inmarsat)

## POWER SUPPLY

**Internal Battery** Field Replaceable Primary and Secondary Battery

**Additional Power Input:** 10-24 V DC Input  
Solar Panel

## DIMENSIONS

**RM4211**  $\varnothing 6.06"$  x  $3.96"$  H (8.22" H with test station adapter)

## DATA INTEGRITY

**Memory** EEPROM  
Queued two-way communication to the RMU is queued in Bullhorn Web and is sent the next time the unit wakes up to transmit)

## ENVIRONMENTAL SPECS

**Temperature**  $-30^{\circ}$  C to  $+60^{\circ}$  C

## SAFETY AND COMPLIANCE

**Certification Mark:** TUV

**Tested Safety Standards** CAN/CSA C22.2 No. 61010-1-2012

CAN/CSA C22.2 No. 61010-2-

030:2012

UL61010-1:2012

UL61010-2-030:2012

## INPUTS

**Readings:** AC current density, DC current density,  
AC pipe-to-soil, DC pipe-to-soil, PCR  
AC current drain or voltage, instant off

**DC Voltage Range:**  $\pm 100$  V

**AC Voltage Range:** 0 - 100 V

**AC Current Range:** 0 - 200 mA

**Input Impedance** 10 M $\Omega$

**Channel-to-channel isolation**  $\geq 200$  V DC

## INSTANT OFF

**IR Drop Edge Delay:** IR drop edge delay: 200 ms

## CONFIGURATION

**Bullhorn Tools Mobile** via Bluetooth Low Energy

## SOFTWARE INTERFACE

**Bullhorn Web**

**Bullhorn Tools for IOS and Andriod**

## COMMUNICATIONS

**Cellular:** LTE Cat-M Cellular (AT&T)

## POWER SUPPLY

Internal, field-replaceable primary and secondary batteries

3-7 year life when recording measurements hourly or daily with weekly transmissions

Additional solar or DC input voltage: 10-24 V DC

## DIMENSIONS

**RM4210**  $\varnothing 6.06'' \times 3.96''$  H (8.22'' H with test station adapter)

## DATA INTEGRITY

Data stored in nonvolatile (EEPROM) memory

Queued two-way communication (communication to the RMU is queued in Bullhorn Web and is sent the next time the unit wakes up to transmit)

## ENVIRONMENTAL SPECS

**Temperature** -30° C to +60° C

## SAFETY AND COMPLIANCE

**Certification Mark** TUV

**Tested Safety Standards** CAN/CSA C22.2 No. 61010-1-2012  
CAN/CSA C22.2 No. 61010-2-030:2012  
UL61010-1:2012  
UL61010-2-030:2012

## INPUTS

<b>Readings:</b>	Three analog measurements; any combination of AC & DC pipe-to-soil, On and Off Potentials, Rectifier Volts and Amps (with external shunt), and Bond Negatives. Instant off through Coupon. One percent reading accuracy through the range with auto-calibration and auto-zero for every measurement. 1 mV measurement will be accurate within $\pm 10$ microvolts
<b>DC Voltage Range:</b>	$\pm 100$ V
<b>AC Voltage Range</b>	0-100 V
<b>Input Impedance</b>	10 M $\Omega$
<b>Channel-to-channel isolation</b>	$\geq 200$ V DC

## INSTANT OFF

<b>IR Drop Edge Delay</b>	Configurable IR drop edge delay: 200 ms default
<b>Logic Levels</b>	minimum Logic 1 = 2 V; maximum Logic 0 = 800 mV
<b>Scan Rate</b>	16 scans per second
<b>Accumulator maximum cycle rate:</b>	1 cycle/2 s
<b>Minimum state change period:</b>	1 s
<b>Minimum pulse width:</b>	250 ms

## CONFIGURATION

<b>Bullhorn Tools</b>	via Bluetooth Low Energy
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## SOFTWARE INTERFACE

**Bullhorn Web**

**Bullhorn Tools for IOS and Andriod**

## COMMUNICATIONS

**Satellite** IsatData Pro (Inmarsat)

## POWER SUPPLY

**Internal Battery** Field Replaceable Primary and Secondary Battery

**Additional Power Input:** 10-24 V DC Input  
Solar Panel

## DIMENSIONS

**RM4211**  $\varnothing 6.06'' \times 3.96''$  H (8.22'' H with test station adapter)

## DATA INTEGRITY

**Memory** EEPROM  
Queued two-way communication (communication to the RMU is queued in Bullhorn Web and is sent the next time the unit wakes up to transmit)

## ENVIRONMENTAL SPECS

**Temperature** -30° C to +60° C

## SAFETY AND COMPLIANCE

**Certification Mark:** TUV  
**Tested Safety Standards** CAN/CSA C22.2 No. 61010-1-2012

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## INPUTS

<b>Channels</b>	2 analog channels
<b>Max DC Voltage</b>	+/-30Vdc
<b>Max AC Voltage</b>	20V
<b>Accuracy</b>	DC Voltage: +/-1% + 1mV AC Voltage: +/-1.25% + 5mV Ranges can handle simultaneous DC and AC voltages
<b>Input Impedance</b>	10 Meg ohms
<b>Channel-to-Channel Isolation</b>	200V (DC or AC)
<b>Surge Immunity</b>	The RM5 system survives 8kV peak-to-peak, 300ms transients. Includes full 3-year warranty.

## POWER

<b>Power Source</b>	Field-replaceable, AA lithium batteries (x4)
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## COMMUNICATIONS

<b>Cell Network (RM540C)</b>	LTE-M
<b>Satellite Network (RM540S)</b>	Iridium (above-grade version only)
<b>GPS</b>	GPS Network, Accurate to 5m

## DIMENSIONS

<b>RM540 (Above grade)</b>	3.05" D x 5.07" H
<b>RM540 (Grade level)</b>	3.64" D x 7.66" H

## ENVIRONMENTAL SPECS

<b>Temperature</b>	-30° C to +60° C
<b>Humidity</b>	0 - 95%

## CERTIFICATIONS

<b>FCC</b>	
<b>Industry Canada</b>	

## Product Training & Enablement



Scan the QR code to access Bullhorn RM540 training content.



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## INPUTS

<b>Channels</b>	3 analog channels (2 structure and 1 shunt)
<b>Max DC Voltage</b>	+/-30Vdc
<b>Max AC Voltage</b>	20V
<b>Accuracy</b>	DC Voltage: +/-1% + 1mV AC Voltage: +/-1.25% + 5mV Ranges can handle simultaneous DC and AC voltages
<b>Input Impedance</b>	10 Meg ohms
<b>Channel-to-Channel Isolation</b>	200V (DC or AC)
<b>Surge Immunity</b>	The RM5 system survives 8kV peak-to-peak, 300ms transients. Includes full 3-year warranty.

## INTERRUPTION

<b>Interruption Verification</b>	Every five minutes
<b>Minimum Switching Cycle</b>	1s
<b>On/Off Cycle Increments</b>	100ms
<b>Relay Support</b>	System surge rating maintained only with REL2502 SSR.

## RELAY SPECIFICATIONS

<b>Type</b>	Solid State Relay
<b>Max Load Current</b>	20A
<b>Shunt Value</b>	3 mOhms (3 mV = 1A)
<b>Control Input Voltage</b>	3.3V
<b>Operating Voltage</b>	100V peak/70 Vrms

## POWER

<b>Power Source</b>	Field-replaceable, AA lithium batteries (x8)
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## COMMUNICATIONS

<b>Cell Network (RM520C)</b>	LTE-M
<b>Satellite Network (RM520S)</b>	Iridium
<b>GPS</b>	GPS Network, Accurate to 5m

## DIMENSIONS

<b>RM520</b>	3.05" D x 6.30" H
<b>REL2502</b>	2.92" L x .94 W x 9.59" H

## ENVIRONMENTAL SPECS

<b>Temperature</b>	-30° C to +60° C
<b>Humidity</b>	0 - 95%

## CERTIFICATIONS

<b>FCC</b>	
<b>Industry Canada</b>	

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