Bullhorn® Monitoring

REMOTE MONITORS FOR TEST STATIONS

American Innovations

Find the Right Bullhorn for Your Test Points






Click for Detailed Specifications:	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	✓ AC Current Density ✓ DC Current Density ✓ Pipe-to-Soil ✓ Drain Current ✓ IR Free Instant Off	✓ Pipe-to-Soil ✓ Bond Negatives ✓ IR Free Instant Off	✓ AC Current Density ✓ DC Current Density ✓ Pipe-to-Soil ✓ Drain Current ✓ IR Free Instant Off	✓ Pipe-to-Soil ✓ Bond Negatives ✓ IR Free Instant Off	✓ Pipe-to-Soil ✓ Bond Negatives ✓ IR Free Instant Off	✓ Pipe-to-Soil ✓ Bond Negatives ✓ IR Free Instant Off ✓ Bond Current
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	✓ Test Head ✓ Flat-Base	✓ Test Head ✓ Flat-Base	✓ Test Head ✓ Flat-Base	✓ Test Head ✓ Flat-Base	✓ Test Head ✓ Below Grade Housing (RM540C Only)	✓ Test Head
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	PDF	PDF	PDF	PDF	PDF	PDF

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Bullhorn RM4210 Specifications

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:	±100 V
AC Voltage Range:	0 - 100 V
AC Current Range:	0 - 200 mA
Imput Impendance	10 MΩ
Channel-to-channel isolation	≥ 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

Satellite:	IsatData Pro Satellite (Inmarsat)

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	Ø 6.06'' x 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

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Bullhorn RM4211 Specifications

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 ±10 microvolts
DC Voltage Range:	±100 V
AC Voltage Range	0-100 V
Imput Impendance	10 MΩ
Channel-to-channel isolation	≥ 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	Ø6.06” x 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

Certifcation 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

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Bullhorn RM4250 Specifications

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:	±100 V
AC Voltage Range:	0 - 100 V
AC Current Range:	0 - 200 mA
Imput Impendance	10 MΩ
Channel-to-channel isolation	≥ 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	Ø 6.06'' x 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

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Bullhorn RM4251 Specifications

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 ±10 microvolts
DC Voltage Range:	±100 V
AC Voltage Range	0-100 V
Imput Impendance	10 MΩ
Channel-to-channel isolation	≥ 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 Android	

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	Ø6.06” x 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

Certifcation 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

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Bullhorn RM540S/C Specifications

INPUTS

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

POWER

Power Source	Field-replaceable, AA lithium batteries (x4)

COMMUNICATIONS

Cell Network (RM540C)	AT&T LTE
Satellite Network (RM540S)	Iridium (above-grade version only)
GPS	GPS Network, Accurate to 5m

DIMENSIONS

RM540 (Above-Grade)	3.05” D x 5.07” H

ENVIRONMENTAL SPECS

Temperature	-30° C to +60° C
Humidity	0 - 95%

CERTIFICATIONS

FCC
Industry Canada

FREQUENTLY ASKED QUESTIONS (FAQs)

Is read-on-demand available for the Bullhorn RM540?

Because the RM540 is designed for infrequent reporting schedules and maintains a sleep state between transmissions, read-on-demand via Bullhorn Web is not available for the RM540.

What is the most frequent reporting schedule available for the Bullhorn RM540?

The most frequent reporting schedule available for the RM540 is 2 weeks.

How do I configure the Bullhorn RM540 settings and validate communication during the installation process?

To configure the RM540 and validate communication during the installation process, you can use the Bullhorn Tools app. You can download this app from either the Google Play Store for Android devices or the Apple App Store for iOS devices.

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Bullhorn RM520 Specifications

INPUTS

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

INTERRUPTION

Minimum Switching Cycle	1s
On/Off Cycle Increments	100ms
Relay Support	System surge rating maintained only with REL2502 SSR.

RELAY SPECIFICATIONS

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

POWER

Power Source	Field-replaceable, AA lithium Batteries (x8)

COMMUNICATIONS

Cell Network (RM520C)	AT&T LTE
Satellite Network (RM520S)	Iridium
GPS	GPS Network, Accurate to 5m

DIMENSIONS

RM520	3.05” D x 6.30” H
REL2502	2.92” L x .94 W x 9.59” H

ENVIRONMENTAL SPECS

Temperature	-30° C to +60° C
Humidity	0 - 95%

CERTIFICATIONS

FCC
Industry Canada

FREQUENTLY ASKED QUESTIONS (FAQs)

Is read-on-demand available for the Bullhorn RM520?

Because the RM520 is designed for infrequent reporting schedules and maintains a sleep state between transmissions, read-on-demand via Bullhorn Web is not available for the RM520.

What is the most frequent reporting schedule available for the Bullhorn RM520?

The most frequent reporting schedule available for the RM540 is 1 week.

How do I configure the Bullhorn RM520 settings and validate communication during the installation process?

To configure the RM520 and validate communication during the installation process, you can use the Bullhorn Tools app. You can download this app from either the Google Play Store for Android devices or the Apple App Store for iOS devices.

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