

## REMOTE MONITORS FOR RECTIFIERS



## **SATELLITE**

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## SATELLITE/CELLULAR

# Find the Right Bullhorn for Your Rectifiers











Click for Detailed Specifications:	RM4014S	RM4015	RM4016	RM4150S	RM510S/RM510C
Application	Rectifier	Rectifier	Rectifier	Rectifier	Rectifier
Analog Channels	4	4	4	5	4
Digital Channels	2	2	2	2	2
Typical Measurements	<ul><li>Rectifier Volts</li><li>Rectifier Amps</li><li>Pipe-to-Soil</li></ul>	<ul><li>✓ Rectifier Volts</li><li>✓ Rectifier Amps</li><li>✓ Pipe-to-Soil</li></ul>	<ul><li>✓ Rectifier Volts</li><li>✓ Rectifier Amps</li><li>✓ Pipe-to-Soil</li></ul>	<ul><li>✓ Rectifier Volts</li><li>✓ Rectifier Amps</li><li>✓ Pipe-to-Soil</li><li>✓ Instant Off</li></ul>	<ul><li>✓ Rectifier Volts</li><li>✓ Rectifier Amps</li><li>✓ Pipe-to-Soil</li><li>✓ Instant Off</li></ul>
Interruption	Yes	Yes	No	Yes	Yes
Communication	Two-Way	Two-Way	One-Way	Two-Way	Two-Way
Mounting	External	Internal	External	Internal	Internal/External
Surge Immunity	Hardened	Requires Surge Kit	Requires Surge Kit	Hardened	Hardened
Surge Rating	30kV	8kV	8kV	30kV	30kV System Surge
Power Source	Line	Line	Solar	Line	Line
Backup Power	Battery	Battery	Battery	Battery	Battery
Warranty	3 Year All Inclusive	Standard	Standard	3 Year All Inclusive	3 Year All Inclusive
View More Details					



## **Bullhorn RM4014S Specifications**

INPUTS	
4 Analog Channels	4 analog + 2 digital channels
Channel 1, 3, 4 DC Voltage Range:	+/- 5 V
Channel 2, AC Voltage Range	+/- 100 V
Scan Rate	16 scans per second
Channel-to-channel isolation	≥ 250 V DC
	Survives multiple 30KV strikes.
Surge	Tested using 50uS waveform to simulate lightning strike.
Accuracy	2% of reading
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Functions	accumulator reset, or contact closure (0 - 15 V DC)
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:	1s
Minimum pulse width:	250 ms

Digital input, accumulator,

#### INTERRUPTION OPTIONS

Maximum current:	500 mA DC
Output voltage:	10-14 V DC
Min. switching cycle:	No or NC, Solid State or Mechanical
On/off cycle increments:	100 ms
Interruption modes:	Daily, interference, start/stop, and continuous
Interference mode:	Set up to 99 rectifiers or groups for influence studies
Relay types:	NO or NC, solid state or mechanical

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**Bullhorn Web** 

**Bullhorn Tools for PC** 

#### COMMUNICATIONS

Satellite:	Orbcomm - IsatData Pro
Poll reconfigure and so	ot alarm thresholds over-the-air

#### **POWER SUPPLY**

AC:	100 - 240 V AC with included AC/DC converter
DC:	10-14 V DC with interruption;
	5-25 V DC without interruption
Backup:	Internal sealed rechargeable
zackap.	battery

#### **DIMENSIONS**

RM4014s	NEMA 4X compliant enclosure
	(75" v 5 25" v 12 25")

#### **DATA INTEGRITY**

**Memory** EEPROM

#### **ENVIRONMENTAL SPECS**

Temperature	-30° C to +70° C
Humidity	0 - 100% non-condensing

#### **SAFETY AND COMPLIANCE**

EN61010-1:2010	
EN61010-2-030:2010	

CAN/CSA C22.2 No. 61010-1-

2012

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

030:2010

UL61010-1:2012 supplemented

by

UL61010-2-030:2012







## **Bullhorn RM4015 Specifications**

INPUTS	
4 Analog Channels	
Channel 1, 3, 4 DC Voltage Range:	+/- 5 V
Channel 2, AC Voltage Range	+/- 100 V
Scan Rate	16 scans per second
Channel-to-channel isolation	≥ 250 V DC
Accuracy	2% of reading

#### **2 DIGITAL CHANNELS**

Functions	Digital input, accumulator, accumulator reset, or contact closure (0 - 15 V DC)
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:	1s
Minimum pulse width:	250 ms

#### INTERRUPTION OPTIONS

Maximum current:	500 mA DC
Output voltage:	10-14 V DC
Min. switching cycle:	1s
On/off cycle increments:	100 ms
Interruption modes:	Daily, interference, start/stop, and continuous
Interference mode:	Set up to 99 rectifiers or groups for influence studies
Relay types:	NO or NC, solid state or mechanical

#### **SOFTWARE INTERFACE**

**Bullhorn Web** 

**Bullhorn Tools for PC** 

#### COMMUNICATIONS

Orbcomm: IsatData Pro
Poll, reconfigure, and set alarm thresholds over-the-air

#### **POWER SUPPLY**

AC:	100 - 240 V AC with included AC/DC converter
DC:	10-14 V DC with interruption;
Backup:	5-25 V DC without interruption
	Internal sealed rechargeable
	battery

#### **DIMENSIONS**

RM4015 Polycarbonate enclosure 4.75" x 3" x 8"

#### **DATA INTEGRITY**

**Memory** EEPROM

#### **ENVIRONMENTAL SPECS**

Temperature	-30° C to +70° C
Humidity	0 - 100% non-condensing

#### SAFETY AND COMPLIANCE

Certifcation Mark:	TUV
Tested Safety Standards	EN61010-1:2010
	EN61010-2-030:2010
	CAN/CSA C22.2 No. 61010-1- 2012
	CAN/CSA C22.2 No. 61010-2- 030:2010
	UL61010-1:2012 supplemented by UL61010-2-030:2012
Emissions:	FCC Part 15
Surge	8kV Air / 4kV Contact

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## **Bullhorn RM4016 Specifications**

# INPUTS

4 Analog Channels

Channel 1, 3, 4 DC Voltage

Range:

+/- 5 V

Channel 2, DC Voltage Range

+/- 100 V

16 scans per second

Channel-to-channel isolation

 $\geq$  250 V DC

Accuracy

Scan Rate

2% of reading

#### 2 DIGITAL CHANNELS

Functions

Digital input, accumulator, accumulator reset, or contact

closure (0 - 15 V DC)

Logic Levels

Scan Rate

Minimum logic 1 = 2 V; Maximum logic 0 = 800 mV

1 scan per second

Minimum pulse width:

250 ms

#### SOFTWARE INTERFACE

**Bullhorn Web** 

**Bullhorn Tools for PC** 

#### COMMUNICATIONS

Orbcomm:

IsatData Pro

#### **POWER SUPPLY**

Solar:

3.4 Amp-Hr sealed lead acid battery with 1.6 W solar panel

#### **DIMENSIONS**

RM4016

Weatherproof enclosure

8.5" x 6.5" x 4.5"

#### DATA INTEGRITY

Memory

EEPROM

#### **ENVIRONMENTAL SPECS**

Temperature

-30° C to +70° C

Humidity

0 - 95% non-condensing

#### **SAFETY AND COMPLIANCE**

**Emissions:** 

FCC Part 15

Surge

8kV Air / 4kV Contact

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## **Bullhorn RM4150S Specifications**

INPUTS	
5 Analog Channels	
DC Voltage Range:	±150 V with accuracy of 1% of reading
AC Voltage Range	150 V with accuracy of 1% of reading
Input Impendance	10 ΜΩ
Scan Rate	Once every 30 seconds
Channel-to-channel isolation	≥ 250 V DC
	Survives multiple 30KV strikes.
Surge	Tested using 50uS waveform to simulate lightning strike.

INPUTS	
5 Analog Channels	
DC Voltage Range:	$\pm 150~V$ with accuracy of 1% of reading
AC Voltage Range	150 V with accuracy of 1% of reading
Input Impendance	10 ΜΩ
Scan Rate	Once every 30 seconds
Channel-to-channel isolation	≥ 250 V DC
	Survives multiple 30KV strikes.
Surge	Tested using 50uS waveform to simulate lightning strike.
2 DIGITAL CHANNELS	

Scan Rate	Once every 30 seconds
Channel-to-channel isolation	≥ 250 V DC
	Survives multiple 30KV strikes.
Surge	Tested using 50uS waveform to simulate lightning strike.
2 DIGITAL CHANNELS	3
Functions	Digital input, accumulator, accumulator reset, or contact closure (0 - 24 V DC)
Minimum Logic	1 = 2 V
Maximum Logix	0 = 1 V
Scan Rate	20 scans per second
Minimum pulse width:	250 ms
INTERRUPTION	
Switch Out Channel	
Maximum current:	500 mA DC
Output voltage:	10-14 V DC
Minimum switching cycle:	1s
On/off cycle increments:	100 ms
Interruption modes:	Daily, interference, start/stop, continuous, and Instant Off
Interference mode:	Set up to 99 rectifiers or groups for influence studies
Relay types:	NO or NC, solid state or mechanical
INSTANT OFF	
Analog channel 3:	± 10 V DC, sampled 60 times per sec
IR drop edge delay:	0 to 60 seconds in increments of 1 ms

Configuration	GPS-synchronized measurement using configurable on, off, and delay settings
COMMUNICATIONS	3
GSM cellular:	Worldwide compatibility on LTE cellular networks
	Carrier independent.
USA:	Automatically selects the best signal.
Poll, reconfigure, and set alar	m thresholds over-the-air
SOFTWARE INTERF	ACE
Bullhorn Web	
Bullhorn Tools for PC	
POWER SUPPLY	
AC:	100 - 240 V AC with included AC/DC converter
DC:	10-14 V DC with interruption;
DC:	5-25 V DC without interruption
Backup:	Internal sealed rechargeable
	battery
DIMENSIONS	
RM4150S	Polycarbonate enclosure (5" x 2.25" x 8")

RM4150S	Polycarbonate enclosure (5" x 2.25" x 8")
External mount (optional):	Aluminum Enclosure
Part #: 517200-000	(7 3" × Δ" × 12 Δ")

DATA INTEGRITY	

ENVIRONMENTAL SPECS	
Temperature	-30° C to +70° C
Humidity	0 - 95% non-condensing

**EEPROM** 

**Tested Safety Standards** FCC Part 15

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Memory



# Bullhorn RM510S/RM510C Specifications

INPUTS	
Channels	4 analog + 2 digital channels
Max DC Voltage	+/-150Vdc
Max AC Voltage	100V
	+/- 2% of range.
Accuracy	Ranges: +/-1.25V, +/-2.5V, +/-5V, +/-63.75V, +/-127.5V, +/-255V. Ranges can handle simultaneous DC and AC voltages
Input Impedance	20 Meg ohms
Channel-to-Channel Isolation	>250Vdc
Surge Immunity	The RM5 system survives 30kV peak-to-peak, 300ms transients. Includes full 3-year warranty.
DIGITAL	
Minimum Logic	<1.1V for logic low
Maximum Logic	>1.1V for logic high, 20Vmax
INTERRUPTION	
Interruption Verification	Every five minutes
Maximum Current	500mAdc
Output Voltage	10-14Vdc
Minimum Switching Cycle	1s
On/Off Cycle Increments	100ms
Relay Support	System surge rating maintained only with REL2510 100V/100A AC SSR. Use AI Lightning Arrestor if using other relays (Mercury or Solid State).
POWER	
Input	12Vdc
Power Source	RM5 Power Supply providing Output of 12Vdc @ 1A Max with Input of 10-42Vac/dc @ 3A Max

COMMUNICATIONS  Cell Network (RM510C) AT&T  Satellite Network (RM510S) Iridium  GPS GPS Network, Accurate to 5m  DIMENSIONS  Dome 4" x 6.4" x 2.2"  IO 2.4" x 4.88" x 1.1"  Terminal Blocks 1.38" x 2.48" x 0.75"  Power Supply 1.85" x 4.37" x 1.09"  Relay 2.98" x 5.5" x 0.84"  ENVIRONMENTAL SPECS  Temperature (Dome, IO, PS, and Relay) 0 - 100%  Humidity (IO, PS, and Relay) 0 - 95%  CERTIFICATIONS  FCC Industry Canada  DATA  Memory EEPROM	atellite Network (RM510C)  AT&T  AT&E  ATA  AT&E  ATA  AT&E  ATA  ATA		
Satellite Network (RM510S) Iridium  GPS GPS Network, Accurate to 5m  DIMENSIONS  Dome 4" x 6.4" x 2.2"  IO 2.4" x 4.88" x 1.1"  Terminal Blocks 1.38" x 2.48" x 0.75"  Power Supply 1.85" x 4.37" x 1.09"  Relay 2.98" x 5.5" x 0.84"  ENVIRONMENTAL SPECS  Temperature (Dome, IO, PS, and Relay) 0 - 100%  Humidity (Dome) 0 - 100%  CERTIFICATIONS  FCC Industry Canada  DATA	Iridium   GPS Network, Accurate to 5m	COMMUNICATIONS	
GPS Network, Accurate to 5m  DIMENSIONS  Dome 4" x 6.4" x 2.2"  IO 2.4" x 4.88" x 1.1"  Terminal Blocks 1.38" x 2.48" x 0.75" Power Supply 1.85" x 4.37" x 1.09" Relay 2.98" x 5.5" x 0.84"  ENVIRONMENTAL SPECS  Temperature (Dome, IO, PS, and Relay) 0 - 100% Humidity (Dome) 0 - 100%  Humidity (IO, PS, and Relay) 0 - 95%  CERTIFICATIONS  FCC Industry Canada  DATA	GPS Network, Accurate to 5m  IMENSIONS  IMEN	Cell Network (RM510C)	AT&T
DIMENSIONS	IMENSIONS  ome	Satellite Network (RM510S)	Iridium
Dome       4" x 6.4" x 2.2"         IO       2.4" x 4.88" x 1.1"         Terminal Blocks       1.38" x 2.48" x 0.75"         Power Supply       1.85" x 4.37" x 1.09"         Relay       2.98" x 5.5" x 0.84"         ENVIRONMENTAL SPECS         Temperature (Dome, IO, PS, and Relay)         -30° C to +60° C         Humidity (Dome)         Humidity (IO, PS, and Relay)       0 - 95%         CERTIFICATIONS         FCC         Industry Canada         DATA	2.4" x 4.88" x 1.1" 2.4" x 4.88" x 1.1" 2.4" x 4.88" x 1.1" 2.98" x 2.48" x 0.75" 2.98" x 5.5" x 0.84"  NVIRONMENTAL SPECS  Emperature (Dome, IO, PS, and Relay)  umidity (Dome)  0 - 100%  ERTIFICATIONS  CC  dustry Canada  ATA	GPS	
IO	2.4" × 4.88" × 1.1"  Perminal Blocks  1.38" × 2.48" × 0.75"  Dower Supply  1.85" × 4.37" × 1.09"  2.98" × 5.5" × 0.84"  NVIRONMENTAL SPECS  Emperature (Dome, IO, PS, and Relay)  1.30° C to +60° C	DIMENSIONS	
Terminal Blocks  1.38" x 2.48" x 0.75"  Power Supply  1.85" x 4.37" x 1.09"  Relay  2.98" x 5.5" x 0.84"  ENVIRONMENTAL SPECS  Temperature (Dome, IO, PS, and Relay)  -30° C to +60° C  Humidity (Dome)  0 - 100%  Humidity (IO, PS, and Relay)  0 - 95%  CERTIFICATIONS  FCC  Industry Canada  DATA	erminal Blocks  1.38" x 2.48" x 0.75"  Dower Supply  1.85" x 4.37" x 1.09"  2.98" x 5.5" x 0.84"  NVIRONMENTAL SPECS  Emperature (Dome, IO, PS, and Relay)  1.30° C to +60° C	Dome	4" x 6.4" x 2.2"
Power Supply  Relay  2.98" x 5.5" x 0.84"  ENVIRONMENTAL SPECS  Temperature (Dome, IO, PS, and Relay)  Humidity (Dome)  0 - 100%  Humidity (IO, PS, and Relay)  CERTIFICATIONS  FCC  Industry Canada  DATA	nvironmental SPECS  Indicate (Dome, IO, PS, and Relay)  Indicate (IO, PS, and Relay)	Ю	2.4" x 4.88" x 1.1"
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ENVIRONMENTAL SPECS  Temperature (Dome, IO, PS, and Relay)  Humidity (Dome)  O - 100%  Humidity (IO, PS, and Relay)  CERTIFICATIONS  FCC  Industry Canada  DATA	NVIRONMENTAL SPECS  Imperature (Dome, IO, PS, and Relay)  Imperature (Dome, IO, PS, and IO,	Power Supply	1.85" x 4.37" x 1.09"
Temperature (Dome, IO, PS, and Relay)  Humidity (Dome)  Humidity (IO, PS, and Relay)  CERTIFICATIONS  FCC  Industry Canada  DATA	emperature (Dome, IO, PS, and Relay)  umidity (Dome)  umidity (IO, PS, and Relay)  ERTIFICATIONS  CC  dustry Canada  ATA	Relay	2.98" x 5.5" x 0.84"
Humidity (Dome)  Humidity (IO, PS, and Relay)  CERTIFICATIONS  FCC  Industry Canada  DATA	umidity (Dome)  Umidity (IO, PS, and Relay)  ERTIFICATIONS  CC  dustry Canada  ATA	ENVIRONMENTAL SI	PECS
Humidity (IO, PS, and Relay) 0 - 95%  CERTIFICATIONS  FCC Industry Canada  DATA	ERTIFICATIONS  CC  dustry Canada  ATA		-30° C to +60° C
CERTIFICATIONS  FCC Industry Canada  DATA	ERTIFICATIONS  CC  dustry Canada  ATA	Humidity (Dome)	0 - 100%
FCC Industry Canada  DATA	dustry Canada	Humidity (IO, PS, and Relay)	0 - 95%
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DATA	ATA	FCC	
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