BCA BEACON CHECKER

GUIDE TO INSTALLATION AND OPERATION

Rev 2014-E

CONTACT INFORMATION

For additional information or support, please contact:

Backcountry Access, Inc.
2820 Wilderness Place
Suite H
Boulder CO, 80301
USA
Telephone: +1 303 417-1345
Fax: +1 303 417-1625
e-mail: info@backcountryaccess.com
web site: www.backcountryaccess.com

CONTENTS

INTRODUCTION

Thank you for choosing a Backcountry Access Beacon Checker for your facility. With this decision, you have joined the elite facilities around the world taking a leadership position in backcountry safety and risk awareness. The BCA Beacon Checker is a versatile tool that can help minimize the risks inherent in backcountry travel by supporting proper transceiver use.

In the patrol shack:
- Indicates transmitter status to exiting patrollers, reducing the risk of patrolling without a beacon or with a beacon that is not turned on and transmitting.
- Aids in the detection of weak or damaged transmitters.
- Prevents a beacon being left in search mode after a beacon check.
- Prevents overnight battery drainage by reminding when a beacon is transmitting.

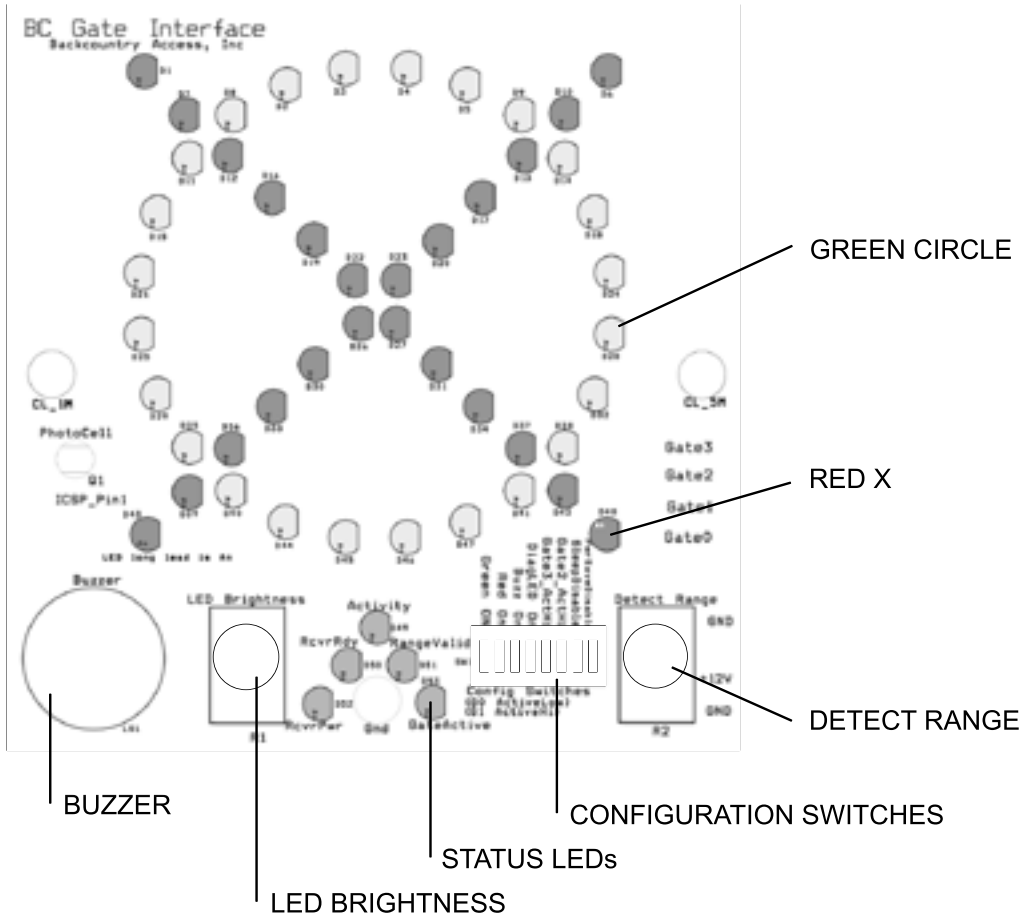
In the lift line:
- Provides a go/no-go signal where beacon use is required.
- Confirms that a transceiver is present, turned on, and in transmit mode.
- Reaffirms the institution's support of responsible backcountry use.

At ski area boundaries:
- Provides a go/no-go signal and/or actuates a gate where beacon use is required.
- Confirms that a transceiver is present, turned on, and in transmit mode.
- Reaffirms the institution's support of responsible backcountry use.
- Raises awareness of the hazards of backcountry travel and the unquestionable necessity of proper equipment and perpetual vigilance.

In the hut:
- Prevents skiers from leaving the hut without beacons or with beacons that are not transmitting correctly.
- Prevents a beacon being left in search mode after a beacon check.
- Prevents overnight battery drainage by reminding when a beacon is transmitting.
- Raises awareness of the hazards of backcountry travel and the unquestionable necessity of proper equipment and perpetual vigilance.

WARNING

The BCA Beacon Checker is designed to closely match the receiving characteristics of a standard avalanche transceiver. However, although a transmitter may be recognized by the BCA Beacon Checker, it is not guaranteed to be transmitting within specification, or to be identified by all receivers. Always perform a manual beacon check to ensure that all transceivers within a group work properly together.



DISPLAY AND CONTROLS DIAGRAM

INSTALLATION

The BCA Beacon Checker comes in a weatherproof enclosure and can be mounted indoors or outdoors.

Metal can affect the strength and shape of electromagnetic fields. The BCA Beacon Checker control box should therefore be mounted AS FAR AS PRACTICAL FROM METAL OBJECTS OR WIRES.

The box may be mounted to any non-metallic surface from the front using the included clips. Alternately, the box may be mounted from the back. A hole pattern for drilling is included at the back of this guide. The back of the enclosure is threaded to accept M4 machine screws.

For outdoor installations, the BCA Beacon Checker may be mounted to a wood post or heavy-duty PVC pipe. A backing board can be mounted with commonly available U-bolts, allowing for vertical adjustment with varying snow levels.

To prevent tampering, it is recommended that the lid of the enclosure be secured by placing a small lock, cable-tie or wire through the provided tabs.

Wiring

For maximum flexibility, the BCA Beacon Checker is provided with unterminated wires that can be connected to a variety of power sources. The Checker is intended to be wired into a common junction box. The user provides the wiring and connections to complete the customized circut.

WIRING LIST	
DESIGNATION	COLOR
Power (12 VDC)	Red
Ground	Green
Output 0	Blue
Output 1	Black
Output 2	Brown
Output 3	White
Ground	Green

Connecting Power

The BCA Beacon Checker is powered by 12 VDC. Any direct-current 12 volt supply capable of sourcing 400 mA may be used. This includes batteries, AC adapters and photovoltaic panels. 400 mA is the base current required to operate the onboard display at full brightness. Any external load imposed on the outputs must be added to this requirement.

DESIGNATION	WIRE COLOR
Power (12 VDC)	Red
Ground	Green

Optional AC Power Supply

Backcountry Access offers an optional AC power supply for installations where line power is available.

AC-DC Adapter, 12V 1A
BCA Part Number: 8310

AC Cable, North America
(Included with AC-DC Adapter)

AC Cable, Europe
BCA Part Number: 8321

Connecting External Devices

The BCA Beacon Checker comes with four separate outputs. These outputs can be used to drive external devices such as lights, gate actuators, sounders, or data loggers.

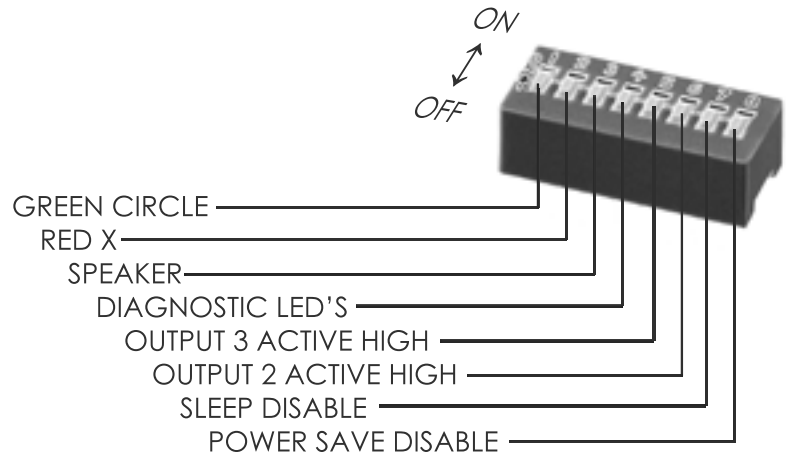
Maximum total output is 1.5 A. Loads in excess of 1.0 A should be distributed by joining two matching outputs. All outputs are referenced to as common ground.

DESIGNATION	WIRE COLOR	TYPE
Output 0	Blue	Active Low
Output 1	Black	Active High
Output 2	Brown	Configurable
Output 3	White	Configurable
Ground	Green	Common

Outputs in the active low configuration provide 0 VDC when a transmitter is within the threshold range and 12 VDC when no transmitter is within the threshold range.

Outputs in the active high configuration provide 12 VDC when a transmitter is within the threshold range and 0 V when no transmitter is within the threshold range.

A common configuration would be to connect Output 0 to a STOP indicator, Output 1 to a GO indicator, Output 2 (set to active high) to a gate latch solenoid and Output 3 (set to active high) to a sounder.



Configuration Switches - Revision E Models
Switch 1 - GREEN CIRCLE
ON: The green circle is displayed when a transmitter is within the threshold range.
OFF: The green circle is never displayed.
Switch 2 - RED X
ON: The red X is displayed when no transmitter is within the threshold range.
OFF: The red X is never displayed.
Switch 3 - BUZZER
ON: Beeps twice when a beacon is first detected within the threshold range.
OFF: Beeps only on power-up.

Switch 4 - DIAGNOSTIC LEDs
ON: The white POWER and READY LEDs are illuminated whenever the device is active.
OFF: The POWER and READY LEDs flash with the activity light.
Switch 5 - OUTPUT 3 ACTIVE HIGH
ON: Output 3 (white wire) will drive 12 V whenever a valid beacon is within the range threshold.
OFF: Output 3 will drive 12 V whenever a valid beacon is NOT present.
Switch 6 - OUTPUT 2 ACTIVE HIGH
ON: Output 2 (yellow wire) will drive 12 V whenever a valid beacon is within the range threshold.
OFF: Output 2 will drive 12 V whenever a valid beacon is NOT present.
Switch 7 - SLEEP DISABLE
ON: Sleep mode is disabled.
OFF: Sleep mode is allowed.
Switch 8 - POWER SAVE DISABLE
ON: Power save mode is disabled.
OFF: Power save mode is allowed.

Sleep Disable

The BCA Beacon Checker is configured, by default, with a sleep feature that conserves power at night. When enabled, the device will enter sleep mode only after dark and after a signal has not been detected for an hour. In sleep mode, the device wakes every 15 seconds to check for signals in the area. If a signal is detected, sleep mode is suspended and the device returns to normal operation. To disable the sleep feature, see page 10 or 12.

Power Save Disable

The BCA Beacon Checker is also provided with a power saving mode enabled. In power saving mode, the red X and green circle flash rather than remaining constantly illuminated. To disable the power save feature, see page 10 or 12.

LED Brightness

The left knob adjusts the brightness of the LED's. Turn counter-clockwise to decrease the brightness. Turn clockwise to increase the brightness. Use caution when increasing the brightness, as very high intensity can be achieved for outdoor applications.

Detect Range

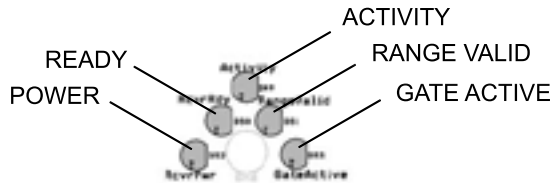
The right knob adjusts the detection range. Transmitters within the range threshold will turn off the red X, turn on the green circle and drive the outputs.

Turn the knob counter-clockwise to set the detection range to the minimum. Turn fully clockwise for maximum range. Actual range will depend on the mounting configuration, so adjust to the desired range while testing with a transmitter.

Regardless of the range setting, the white ACTIVITY LED showing transmitter activity in the area always detects at maximum range.

Buzzer

When turned on, the internal buzzer beeps twice when a new beacon comes within the detect range. The buzzer can be turned on or off with configuration switch 3. The range threshold is set with the knob marked "DETECT RANGE."



Status LEDs
POWER LED
DIAGNOSTIC LEDs SWITCH ON: Power LED is illuminated while power is supplied to the device.
DIAGNOSTIC LEDs SWITCH OFF: Power light flashes with the activity light.
READY LED
DIAGNOSTIC LEDs SWITCH ON: Ready LED is illuminated while power is supplied to the device and the receiver is ready.
DIAGNOSTIC LEDs SWITCH OFF: Ready LED flashes with the activity light.
ACTIVITY LED
Flashes while any transmitter is detected at any range.
RANGE VALID LED
Flashes while a transmitter is within the range threshold.
GATE ACTIVE LED
Illuminates with the green circle (which may be disabled via switch 1) and active outputs.

Power Management

In installations where the BCA Beacon Checker must be powered by batteries, proper power management becomes important. Therefore, the BCA Beacon Checker includes several configurable power saving features, leaving the user free to select the best balance of features and power consumption for the specific application.

It is recommended that a 12VDC Low Voltage Disconnect is connected between the battery and the BCA Beacon Checker to avoid low voltage on the battery damaging the device.

The table below lists approximate power consumption for several common power management configurations.

Common Power Management Configurations					
Configuration	Green Circle	Red X	Power Save	Sleep Mode	Power Consumption
A	on	on	disabled	disabled	2.18 Ah / day
B	on	off	disabled	disabled	0.84 Ah / day
C	on	on	enabled	disabled	0.69 Ah / day
D	on	on	enabled	enabled	0.42 Ah / day

Expected Battery Life (Days of Continuous Operation)					
Battery Type	Configuration → ↓ Battery Capacity	A (2.18 Ah/day)	B (0.84 Ah/day)	C (0.69 Ah/day)	D (0.42 Ah/day)
C-cell Alkaline (x8)	6 Ah	3 days	7 days	9 days	14 days
D-cell Alkaline (x8)	13 Ah	6 days	16 days	19 days	31 days
C-cell NiMH (x8)	2.5 Ah	1 day	3 days	4 days	6 days
D-cell NiMH (x8)	2.5 Ah	1 day	3 days	4 days	6 days
7 Ah Gel Cell	7 Ah	3 days	8 days	10 days	17 days
Lawn Mower Battery	35 Ah	16 days	42 days	51 days	83 days
Car Battery	50 Ah	23 days	60 days	73 days	119 days

Solar Power Options

In installations where the BCA Beacon Checker must be powered only by batteries and solar power in a remote location, proper power management becomes very important. Based on the several configurable power saving features, matching the configuration with battery storage capacity and solar recharging capability will allow the system overcome lower solar energy in northern latitudes or during major storm cycles. It is recommended to use switch configuration D to minimize the power draw and preserve the battery capacity while reducing the overall weight of the installation in remote locations.

By combining a sealed battery larger than 14Ah, a 20 Watt or greater DC solar panel, and a 5A or greater solar charge controller, the system can maintain enough battery capacity for long term maintenance-free use in very remote locations. This configuration also avoids the need for one or more car batteries to power the unit for the entire season. It is also recommended to use a solar charge controller with a Low Voltage Disconnect to prevent low voltage drop damage to the BCA Beacon Checker.