

THE
BLAST GAUGE[®]
SYSTEM

Gen 7+ User Manual

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Welcome to the Gen 7+ Wireless Blast Gauge System

The Gen 7+ Wireless Blast Gauge[®] System (BGS) is a portable, operator worn, cost-efficient blast overpressure (BOP) monitoring sensor system that can be deployed by ground forces in operations and training.

It allows the operator, medic, or leader to measure, record, and display overpressure and acceleration data experienced by the operators during blast events and readily visualize their recent exposure history.

Overpressure exposure represents an occupational hazard for military and law enforcement personnel. Because it is not always practical to provide protection from these blast waves, monitoring and documenting exposure to identify individuals at risk for neurological deficits is paramount.

The Gen 7+ BGS provides several new enhancements over the Generation 7:

- ✓ Flat mesh sensor port to reduce snag risk
- ✓ Improved BOP measurement specificity
- ✓ New, Tan 499 color with the proven, ruggedized exterior of the Blast Gauge
- ✓ Front-of-gauge placement indicator labels for intuitive gauge positioning and verification
- ✓ New, full-featured mobile app supports gauge activation, scanning, & exposure tracking
- ✓ Optional server connection for automated backups and long-term data storage
- ✓ Software is compatible with previous Gen 7 as well as new Gen 7+ Blast Gauges

1. Getting Started

1.1. What's in the Kit

The Blast Gauge System (BGS) is sold as a Kit, containing:

- A set of three gauges, indicating a Head, Shoulder, or Chest mount position.
- One Velcro patch attachment option
- One XL Bungee attachment option



Figure 1: BGS Kit contents

Blast Gauges are also sold individually with a head, shoulder, chest, or as a single – i.e. unassigned position indicator.

Each order includes:

- 1 Quickstart Guide
- 1 USB hub with micro USB cables for connecting gauges to the PC or Mobile device
- Blast Gauge (BG) App for PC or Android Mobile (available for download)
- BGSC – a server application to support long term data management/storage (optional)

1.2. What You'll Need

1.2.1. PC or Mobile Device

To get started, you will need either a PC running Windows 11, or a Phone or Tablet running Android version 12 or later. B3 recommends the latest Samsung Galaxy Phones or Tablets, although other brands running Android version 12 or later may also work.

A USB connection is required to communicate with gauges for initial activation of the BGS and certain gauge operations, such as firmware updates. One USB hub with connectors is provided with each BGS order.

1.2.2. Software - The BG App

The BG App provides all critical features for operating the BGS. You may use either the PC or Mobile app for Blast Gauge activation, data download via USB, gauge management such as firmware updates, turning gauges on/off, or turning Bluetooth wireless on/off.

The BG App for Android additionally supports Bluetooth low energy (BLE) wireless scanning of the gauges and data views optimized for use during training and operations.

The BGS also comes with an optional cloud server application – the BGSC, that supports long-term centralized data storage and retrieval. The BG App can be set up to connect to this server. To use the BGSC, you will need an internet connection and either a physical server or a cloud-based server.

1.3. Register and Download Software

1. Visit blastgauge.com/software to register for access to the BGS software.
2. Once you receive an email verifying successful registration, you may log in at blastgauge.com/software
3. Once logged in, you will see the Download Software page. Select the applications you would like to use and then press “Download”. Now that you are registered, you may re-download software at any time, or get updates from this page.

1.4. Software Install - BG App for Android

The BG App is not available in the Play Store. See 1.3 Register and Download Software for info on how to access the APK installer file.

1. Download the APK file to My Files on the Android device.
2. Press and hold My Files, tap App Info. Then change the setting “install unknown apps” to “Allowed” (one-time step)
3. Tap on the APK file for the BG App. A prompt will be on the screen to install the BG App. Press “Install” and wait for the installation to complete. Press “Open” to use the BG App

1.5. **TO DO** Software Install – BG App for PC

The BG App for PC install file is available for download. See 1.3 Register and Download Software for info on how to access the .EXE install file. Note: Administrator privileges are required to install the application

1. Download the Zip file and extract the contents on the PC.
2. Double-click the EXE setup file to begin the install process
3. To finish once installer is complete.

1.6. Software Install - BGSC

The BGSC cloud server app is provided with an installer for Rocky 9. The download also contains detailed instructions to help you install and configure the BGSC. The install process requires some advanced networking knowledge, and we recommend contacting your IT department to configure and install the server. Contact B3 for any additional questions or if you need to run on a different OS.

For users without access to IT resources, B3 is able to provide cloud data backups using the BGSC as a service. Please contact B3 for support in hosting data backups.

2. BGS Feature Highlights

2.1. Overview

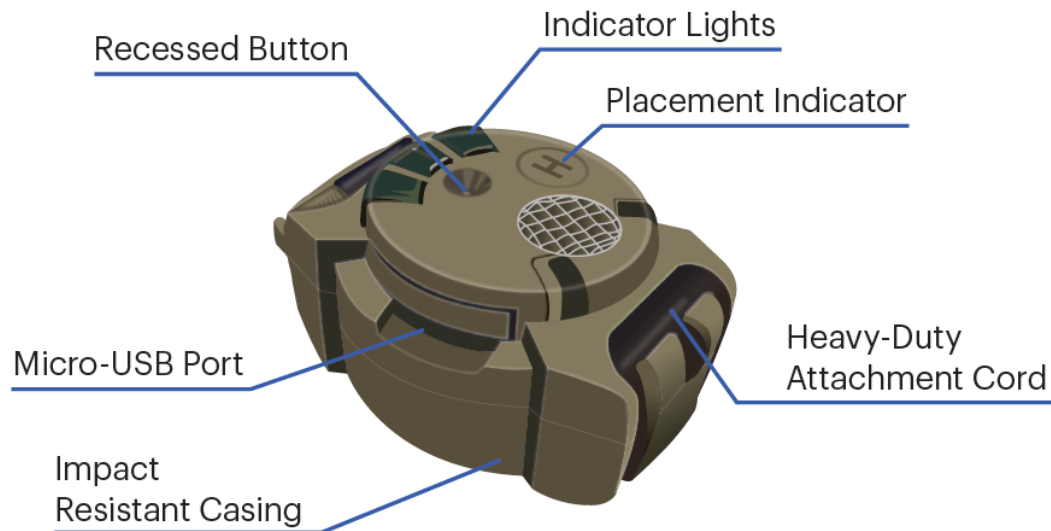


Figure 2: Blast Gauge Features

Each Blast Gauge (BG) features a proven, ruggedized housing that was designed to be resistant impact and explosive frag. The front face features a flat mesh cover that is snag-resistant and protects the sensor from physical damage, sand and water ingress. The placement indicator allows the user to quickly inspect where to position the BG on the body. The BG includes a recessed button interface used to inspect the gauge status via the indicator lights on the gauge when the BG App is not available. A micro-USB port provides a wired interface for gauge management or for data download in situations where Bluetooth is not available.

2.2. System Configuration

Each BGS is comprised of individual Blast Gauges that independently collect data. The gauges are configured as a set during the activation process, and gauges with the same Unique ID are treated as a set – i.e a single sensor system for a user (or structure). A typical configuration for a user is a 3-gauge set consisting of a Head, Shoulder, and Chest gauge. This provides a 360° picture of how a blast wave interacts with the body, and mitigates the risk of gauges being obstructed.

2.3. Automatic Data Capture & On-Gauge Storage

Once activated, Blast Gauges will automatically monitor for blast overpressure (BOP) events. Pressure and acceleration waveforms and summary metrics are collected and stored in non-volatile memory on the gauge, requiring no interaction by the user. The BG features significant on-gauge storage of up to 500 full waveform events, and up to 5000 summary events.

2.4. Interrogated Wireless Bluetooth

The BGS features B3's Interrogated Wireless™ Bluetooth Low Energy (BLE) interface. It allows the user to wirelessly scan and download data from the Blast Gauges at the user discretion, and when the user is not scanning, the Blast Gauges are radio silent – meaning they do not have any RF emissions exceeding MIL-STD 461 thresholds for the Army Ground profile.

3. Activation

All Blast Gauges must be activated prior to use. the activation process includes the assignment to a user (or structure), and other configuration settings. The activation process can be performed with either the BG App for PC or Android, and requires a wired connection. Both applications have the same workflow that will be described in this section.

3.1. Connect Gauges to USB

For any gauges you would like to activate as a set, connect all of those gauges to the PC or Tablet at the start of the activation workflow. Note: on Android, for each gauge you connect, a popup will appear asking “Allow BG App to access Gen 7+ Blast Gauge?”. You will need to tap OK for each connected gauge. Each of the connected gauges should now be visible in the Gauge Manager.



3.2. Activation Workflow

Use the menu to access the Gauge Activation Workflow. On the PC app, click “Activation” in the top menu. On Android, tap the menu in the upper left, then tap “Gauge Activation”.

3.2.1. Step 1 – Product Family

On Android – The app asks you to scan the serial numbers of the gauges to be activated. Scan each gauge to activate as a set.

On the PC - The gauges to activate is based on what is connected.

The activation workflow evaluates the Blast Gauge model and firmware to ensure compatibility. Mixed sets of Gen 7 and Gen 7+ model gauges are supported, but Gen 7 gauges will require a firmware update to be support inter-operability with the Gen 7+ BGS.

Once all gauges that you want to activate for a set are connected, press “Next Step”

3.2.2. Step 2 – Gauge Mode

Select from either **Power Savings** or **Constant Monitor** mode.

B3 recommends selecting Power Saving mode for typical use when worn on personnel during training or operations. Power Saving mode will allow the gauges to transition to a power saving sleep state after 20 minutes of no activity. The gauge will automatically transition back to monitor mode as soon as activity is detected. This dramatically extends the usable life of the gauge with no interaction required by the user to manually turn the Gauges On or Off.

B3 recommends Constant Monitor mode for use on structures or static objects. This disables the power-saving sleep state. Constant Monitor mode is also recommended for use on snipers or other uses expected to be very still. Note: Blast Gauges that are left On in Constant Monitor mode will constantly use battery.

3.2.3. Step 3 – Threshold Adjustment

If you are an inexperienced user, B3 recommends leaving these parameters at their default settings. For Advanced Users, you may tap the lock button to unlock access to the threshold settings for the gauges.

Collection Thresholds: This slider controls the data capture levels for the gauge. The first level is the Trigger threshold, above which BOP data is detected and saved. Summary metrics such as Peak BOP, and Total Positive Impulse (TPI) are saved for all events above the trigger threshold. The Full Waveform threshold, above which the gauge stores the full BOP waveform, in addition to summary metrics for each event. The full waveform data uses more space in memory, but provides valuable data for advanced analysis after a BOP exposure.

Default collection thresholds are 1psi for trigger, and 4psi for full waveform.

Blast Levels: This slider controls the color-based severity indicator used by both the BG App as well as the on-gauge light interface. The first threshold controls what peak BOP is classified as yellow – or a moderate exposure, and the second threshold controls what peak BOP is classified as red – or significant exposure.

Default blast Levels:

- Yellow Threshold - Exposures Exceeding 4psi (default) are shown as Yellow. Exposures below this threshold are shown as Green. *Note: 4 psi is the current exposure guideline used by the US DOD.*
- Red Threshold - Exposures Exceeding 16psi (default) are shown as Red

3.2.4. Step 4 – Identifying Information

For assigning gauges, you must assign a Unique ID for each user (or structure). The Unique ID is not displayed readily within the App U/I, but it is the primary way that a user is identified in the database, and any future gauge assignments should re-use this ID only when assigning gauges to the same person. The unique ID could be an EDI-PI, or another surrogate that uniquely identifies a person.

The unique ID may also be used for the “Display Name” if the box is checked. However, using a person’s name or call sign may be appropriate depending on usage.

Group/Team Name is an optional field to further help classify exposures based on groups of individuals.

3.2.5. Step 5 – Gauge Status

This step allows you to set the gauge to On or Off after activation is complete. If they will be used immediately or are in personnel model, we recommend choosing On. However if they are in Constant Monitor mode, it may be useful to turn them Off to conserve battery between uses.

3.2.6. Step 6 – Summary Review

This step allows you to review all of the selected configurations. If something is wrong you may return back to make any corrections. If everything looks good, press Activate Gauges and wait for the workflow to complete. Once complete, a message will appear to say “You’ve successfully activated your Blast Gauges”. At this point you can disconnect the gauges from USB and gently close the protective USB door on each gauge. If the gauges were set to be On, then the gauges are now ready for use.

When choosing to Activate Another Gauge, the system will remember your most recent settings, making bulk activation simple. You may also choose to return to the Personnel View.

4. Blast Gauge Attachment

Important: Make sure the Blast Gauges have been activated prior to use. See Section 3 for activation instructions.

B3 recommends attaching gauges on the back of the head, chest, and non-firing shoulder. The placement indicator for each Blast Gauge is shown on the back label as well as on the front right side. The following placement indicators are used:

Indicator	Mounting Position
H	Back of Head (Helmet)
S	Non-firing Shoulder
C	Chest
<i>Blank</i>	"Single" – no position defined

Table 1: Placement Indicators

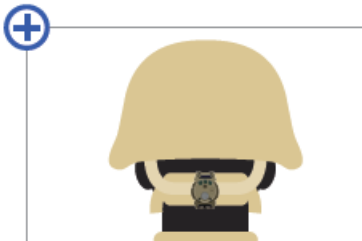
The BGS is flexible and can support alternate placements, including alternate placement around the body, or they may also be mounted to structures or vehicles. The cord can be wrapped around PALS Webbing, or helmet straps, as shown in Figure 3. In the BGS Kit, one Velcro patch and one XL bungee cord are included to provide additional flexibility. Please contact B3 for further assistance with attachment needs.

Attachment



Head

Loop BGS bungee through fabric of Velcro patch then affix patch to back of helmet.



Head (alt.)

Loop XL bungee around nape strap.



Shoulder

Using BGS bungee, attach BGS to PALS webbing on non-firing shoulder.



Shoulder (alt.)

Loop XL bungee around entire shoulder strap.



Chest

Using BGS bungee, attach BGS to PALS webbing on vest.

Attachment Positioning

- 1 Back of head (H)
- 2 Non-firing shoulder (S)
- 3 Chest (C)

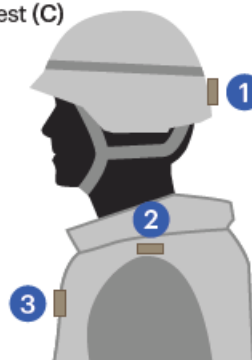


Figure 3: Example Blast Gauge attachment options

To verify the Blast Gauges are on and ready, the user may scan wirelessly via the BG App for Android (see Section 5). Alternately, the user may press the recessed button on each gauge (see Section 6).

Once Blast Gauges are activated, on, and attached, no further action is required. The gauges will automatically record events and store the data.

5. Bluetooth Scanning

The BG App for Android supports data download via a Bluetooth scan. To download data using the PC, you must use USB connect to the gauges. (Note that upon USB connection, data is automatically downloaded onto the BG App).

Note about Gauge Timekeeping: The gauge time is derived from the PC or Tablet at Activation and updated on subsequent connection/scans. The free-running real-time clock embedded in the gauge can drift slowly over time, and periodic scanning with the app updates the RTC. It is highly recommended to ensure that the tablet Date and Time are accurate prior to scanning the Blast Gauges, to prevent erroneous BOP event timestamps.

5.1. Start Scan

To prevent undesired wireless emissions in operations, the Blast Gauges do not emit any RF energy unless the user initiates a wireless scan.

On the Android Tablet, launch the BG App. In the upper right corner, tap Start Scan. The app will scan for any nearby Blast Gauges and download all data. After a successful scan, the Person's (or structure's) name appears in the personnel list. The severity indicator displays the color of severity level set by the user at activation, or will appear gray if no blasts were recorded.

The last scan time is displayed for each gauge in the app, and if a warning will appear if the data connection has been interrupted, and not all data has been downloaded during the last scan.

Once all nearby gauges have been scanned, the scan will timeout, and the Tablet and Gauges will return to radio-silent mode. The length of the timeout can be adjusted in the settings.

5.2. Stop Scan

While scanning is in progress, you may stop or interrupt a scan at any time by tapping Stop Scan in the upper right corner. If operations start up where a user may be exposed to BOP, we

recommend using Stop Scan to ensure the gauges are in active monitor mode rather than in Bluetooth transfer mode.

5.3. Quick Scan

The default setting downloads summary metrics as well as the full Pressure-Time waveforms, and the acceleration-time waveform from the gauges. The BG App also has a Quick Scan feature, which only downloads summary metrics from the Blast Gauges, regardless of whether waveform data was recorded. Quick Scans are valuable during live monitoring of large teams or large numbers of gauges, or when there is little time between exposures to download data.

To enable Quick Scan – navigate to Settings. In the Behavior section, disable “Download waveforms for events from gauge?” Press Yes when the popup appears. Now you will see that the button in the upper right shows “Start Quick Scan”.

Note that disabling full waveforms will prevent the use of any advanced algorithms until the waveforms are downloaded. However, the waveforms are saved on the gauge, and would be available after a full data scan (or USB connection).

6. Blast Gauge User Interface

6.1. Recessed button

The recessed button, positioned directly below the light indicators, is designed to prevent accidental button presses and avoid unintended illumination of the light indicators. The gauge does not display any light notifications until the recessed button is firmly pressed. Use of the button is optional and all information can be obtained via a Bluetooth scan or USB connection.

The recessed button may be used to inspect a Blast Gauge in situations where no app is available. Firmly press the recessed button with a 5.56mm round (or similar round-nosed object). If the gauge is On, the lights should illuminate immediately and display the status of the gauge.

6.2. Light Indicators

Upon a button press, the LED indicators will display the status of the gauge, as described in Figure 4. The exposure status shows the largest peak BOP of all data stored on the Blast Gauge. If no exposures were captured on the BG, or if the gauge was erased, the indicator light will display solid green.

All lights flashing at once indicate a low battery or an error. Scanning with the BG App is recommended to read the details of the error.

Manual Reading (LED Indicator)

Firmly press the recessed button with a 5.56mm round (or similar round-nosed object) if the app is unavailable. The color of LED shown is the highest peak OP detected and saved on the gauge.



Figure 4: Manual Reading (LED Indicator)

If no lights illuminate, it is possible the Blast Gauge was turned Off. If after pressing and holding for 4 seconds, the LEDs still do not illuminate, the battery may be dead. B3 recommends connecting to the BG App via USB to verify if the battery has reached end of life, or to replace the gauge.

6.3. Gauge On/Off via Button Press

The Blast Gauge may be manually turned On or Off via the button press. If the gauge is on, firmly press and hold the button for 4 seconds. As soon as the button is pressed, a status indicator will display. After waiting the full four seconds, you will see an LED sequence: Green → Yellow → Red, which indicates the Gauge is now Off.

Note: the gauge will not capture events, and is not scannable via Bluetooth while Off.

To turn the Blast Gauge On, simply press and hold the button for 4 seconds again. If the Gauge is Off, it will take 4 seconds before an LED shines. Once the gauge is On, the Gauge Status will be illuminated on the LED Indicators per Figure 4.

6.4. USB Door

The micro USB connector on the Blast Gauge is located behind a small, concealed door on the left side of the gauge, shown in Figure 2. Open the door with a fingernail and insert the micro-USB to connect the Blast Gauge to the PC or Tablet. Make sure to close the USB door before deploying to prevent debris from damaging the USB interface

7. **TO DO** BG App for Android

7.1. Feature Overview

The **BG APP** Application was designed to provide a Medic or Team lead with an overview of their unit and allow them to access more detailed data views as needed. The primary screen is a Personnel Roster list, providing summary exposure information for all team members. The user may select to view an individual person's dose, and further drill down into their event history which lists each BOP exposure, and then an individual event detail, with a Body Load view as well as waveform plots.

7.2. Data Download from Gauges

7.2.1. Interrogated Wireless Bluetooth Scanning

7.2.2. Download via USB

7.3. Gauge Manager

7.3.1. BLE Wireless On/Off

7.3.2. Turn Gauges On or Off

7.3.3. Erasing Blast Gauges

Blast gauges can be erased for each user by navigating to the Gauge Details screen. First, select which gauges to erase. The user may select each gauge individually by checking the box on the left-hand side or use the select all feature. Then press the button Erase Gauge in the lower right of the current screen.

If operating in USB mode, the gauges must be connected via USB to erase. The gauges may also be erased wirelessly via the BLE connection.

7.3.4. Re-assign or re-activate gauges

7.3.5. Firmware Update

7.4. Personnel View

The Personnel Screen presents a list of all Blast Gauge Users. One row is presented per individual, the display is comprised of two segments. The roster list is broken into a Triage List and a Cleared list. The Triage List is always at the top and is a list of users who have yellow or red exposures which indicate either Blast or Auditory dose metrics above specific thresholds, and that user should be inspected further. If the person is “cleared” in the app, then they will move down to the Cleared list, which is always located at the bottom of the Personnel Screen.

The user has the option to sort this view via the dropdown menu. When sorting, the Triage List and the Cleared List are each sorted independently, so that the Triage List is always present at the top of the screen.

Each row is designed to indicate key information about each person and their BGS. The Display Name of the user is listed, with the lowest battery indicator of all of their blast gauges shown to the left of their name. The Blast and Auditory dose indicators are the next two columns, where green, yellow, and red indicate low, medium, or high dose respectively. Last Scan shows the last time the app user has connected to the person's gauges to download events, and finally the status column will show "Triage Status" if the person has a new yellow or red dose indicator, or "cleared" if that person has green or no exposures. If there was an unexpected data error during experienced during a connection to a gauge, the Status column will indicate "Data Error" and the dose display will show a blue icon as shown in **Error!**

Reference source not found.. Individuals and their data will remain in the app database and be displayed indefinitely¹. Clicking on a row in the roster list will take you to the Individual view for that person.

7.5. Review an Individual's Exposures

7.5.1. Single & Cumulative Exposure Thresholds

7.5.2. Single Events and Body Load

7.5.3. Gauge Details

7.6. Settings

¹ This architecture may change after cloud connectivity and data storage is integrated into the application.

8. **TO DO** BG App for PC

8.1. Feature Overview

8.2. Data Download From Gauges

8.3. Gauge Manager

8.3.1. BLE Wireless On/Off

8.3.2. Turn Gauge On or Off

8.3.3. Erasing Blast Gauges

8.3.4. Firmware Update

8.4. Personnel Dashboard

8.5. Individual View

8.5.1. Single and Cumulative Exposure Thresholds????

8.5.2. Single Events and Body Load

8.5.3. Gauge Details

8.6. Personnel Reports

8.7. Settings

9. **TO DO** BGSC – Server Application

9.1. Feature Overview

9.2. Account Management

9.3. Downloading and Viewing Reports

10. API Interface

The Blast Gauge System currently supports a public API interface to the BGSC, allowing end users to create their own custom integrations. Please contact B3 for API documentation and integration support.

11. Gauge Storage

Shelf life of the Blast Gauge is 5 years in cool (15°– 25°C), dry, and ventilated areas. Do not store the Blast Gauge near heating equipment or in direct sunlight for prolonged periods. Elevated temperatures can shorten battery life and degrade performance.

12. Cleaning / Disinfect Gauges

To disinfect Blast Gauges, B3 recommends a thorough wipe down of each gauge using a disinfectant wipe. Please ensure the surface of the gauge remains wet for a minimum of 2 minutes. Avoid submersion in chemical disinfectants, spraying with disinfectant, and the user of overly strong chemicals (such as 70% Isopropyl Alcohol).

13. Maintenance

Blast Gauges do not require calibration or other product maintenance over the lifetime of the Blast Gauge, which is 3 years in training. B3 recommends periodic inspection to ensure the sensor mesh is not physically obstructed or damaged. Small brush may be used to clear any debris.

14. Disposal Guidelines

There are no US federal regulations for disposal of lithium batteries. Individual states or localities establish their own guidelines for battery disposal, and should be contacted for any disposal guidelines that they may have for a lithium battery housed in the Blast Gauge.

15. Safety

15.1. Intended Use

The Blast Gauge® System has been designed and manufactured for the purpose of measuring personalized exposures to blast overpressure, in the range of 0.5 – 110psi.

15.2. Disclaimer

The Blast Gauge® System is not intended to diagnose or treat the blast victim's injuries. The first responder may use the Blast Gauge® System data to characterize the blast overpressure the subject sustained during an explosion but must rely on standard diagnostic protocols to drive treatment of the subject's injuries.

15.3. Precautions for Safe Handling

The Blast Gauges are compliant with CE and all associated safety certifications.

A Safety Data Sheet (SDS) is available upon request.

15.4. EU Declaration of Conformity

BlackBox Biometrics, Inc., 3559 Winton Place, Ste. 2, Rochester, NY declares under our sole responsibility the Wireless Blast Gauge® System: Gen 7+ is in conformity with the following standards:

Low Voltage Directive -2014/35/EU

EMC Directive - 2014/30/EU

RoHS (Restriction of Hazardous Substances) Directive - 2011/65/EU

RED Directive – 2014/53/EU

which is indicated and affirmed by the applied CE marking

15.5. FCC Statement

FCC ID: 2AHN8BG7P

FCC Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation

FCC§ 15.21

Changes or modifications made to this equipment not expressly approved by BlackBox Biometrics Inc. could void the user's authority to operate the equipment

FCC§ 15.105

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense

WARNING!

FCC Radiation Exposure Statement:

This portable equipment with its antenna complies with FCC's RF radiation exposure limits set forth for an uncontrolled environment. To maintain compliance, follow the instructions below: This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Avoid direct contact to the antenna, or keep contact to a minimum while using this equipment.

16. Frequently Asked Questions

16.1. How can I transfer data between the BG App for Mobile, and the BG App for PC?

The BGSC server application is designed to work with the BG App to seamlessly synchronize data between the devices, after initial setup. All that is needed is an internet connection and a link to your BGSC account in the BG App settings. Refer to Section 1.6 for BGSC setup, and Section 9 for further info on the BGSC. Please contact B3 for additional support with the BGSC.

16.2. How long will my Blast Gauges last before the battery runs out, and are they rechargeable?

Blast Gauges run on high-capacity batteries that are not rechargeable or replaceable. With common military use in training (10% operational tempo and average temperatures), Blast Gauges last up to 3 years. In combat (30% operational tempo and exposure to temperature extremes), Blast Gauges last one year. Battery life remaining is displayed in the BG App. When a Blast Gauge battery is low (less than 80% remaining), the app will notify the user, and all three LEDs will flash when the button is pressed. If a gauge has no remaining battery, there will be no LED response. The gauge's shelf life is 5 years at room temperature.

16.3. Are there any power saving modes to extend the life of my Blast Gauges?

Yes! **Power saving mode** is an option during activation. This will put the gauges in a low-power sleep state after a short period of total inactivity. While in sleep, it will not record any blast events or connect over Bluetooth. Movement of the gauge will automatically return it to the active monitoring state. Note: if you mount the gauges to a structure, use the Constant Monitor option to disable the sleep state.

Another power saving option is to manually **turn gauges Off** between use. This can be accomplished by connecting to the BG App and using the Gauge Manager, or you may firmly press and hold the recessed button for 4 seconds to turn the gauge off. The Gauge displays a green, yellow, then red sequence to verify that it has been turned off. To turn the gauge back on, simply firmly press the button until a status light appears.

16.4. What is the difference between summary data and full waveform data?

Summary data only provides the following metrics for an exposure: peak pressure, total positive impulse, peak acceleration, and time of exposure. The full waveform data provides all of the summary metrics and also the pressure-time trace, and the acceleration-time trace.

16.5. How can I download data more quickly over Bluetooth?

In the BG App Settings, under Behavior, there is a toggle switch that says "Download waveforms for events from gauge?" If you disable that option, then "Quick Scan" is enabled, where the App only requests summary metrics to be transferred from the gauge, speeding up the data transfer. This can be useful for rapid feedback when doing real-time monitoring, or if there is a lot of data

on the gauge due to prolonged use. Using the Quick Scan will prevent advanced algorithms from running until the waveform data is downloaded.

For example, at activation a user chooses 4 psi as the full waveform threshold. On the range, the gauge records two blast events: Blast A and Blast B, Blast A is a 3 psi blast, which is below the full waveform threshold, so it only has summary data on the gauge. Blast B is a 5 psi blast, so the full waveform is saved on the gauge.

The user then scans using "Quick Scan", so the app only downloads summary data for both Blast A and Blast B, even though full waveform data exists for Blast B. When looking at event details, an icon will display to let the user know that full waveform data exists on the gauge and has not yet been downloaded. When the user selects "Full Data Scan" and initiates the longer scan, the app downloads summary data for the Blast A and full waveform data for Blast B. The notification icon will disappear once the full waveform is downloaded.

Note that if full waveform data is available for an event, it remains on the gauge, and the BG App will download the full waveform data before erasing the gauges to prevent data loss.

16.6. Can I disable the Bluetooth Wireless Feature?

Yes. Bluetooth Wireless can be disabled in the Gauge Manager. Note this does not guarantee complete electromagnetic silence – but The Blast Gauge is compliant with MIL-STD 461 RE102, Army Ground profile.

16.7. How do I Re-Assign or Re-activate Gauges?

Connect the gauge to the BG App using a USB connection. Then simply follow the activation workflow again to re-assign the gauge to another user.

16.8. Is the Blast Gauge System an Approved Medical Device?

No. The Blast Gauge System is not intended to diagnose or treat the blast victim's injuries. The first responder may use the Blast Gauge System data to characterize the blast overpressure and acceleration the subject sustained during an explosion but will rely on standard diagnostic protocols to drive treatment of the subject's injuries. A 513g request for information submitted to the U.S. Food & Drug Agency (FDA) resulted in the determination that the Blast Gauge System is not a device as defined per section 201 (h) of the Federal Food Drug & Cosmetic (FD&C) Act.

Additionally, a request for determination by Health Canada also resulted in determination that the Blast Gauge System would not be considered a medical device.

17. Re-Order Blast Gauges

To purchase the latest version of the Blast Gauge System visit blastgauge.com/get-quote.

18. Customer Support

For additional troubleshooting support and all other inquiries, please contact:

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