GfactorGO powered by TRIAX Play

GfactorGO WIRELESS SURFACE IMPACT TESTER

USER'S MANUAL

REVISION 0.5 June 5, 2023

Turf-Tec International

**1471 Capital Circle NW, Ste #13
Tallahassee, FL. 32303
(850) 580-4026 Fax (850) 580-4027**
www.turf-tec.com

<u>WARNING</u>

Like all battery powered devices, care should be taken during charging of the *Gfactor*Go systems. Only use the approved TRIAX charger, and only charge on non-combustible surfaces such as a work bench. For more information on the batteries and charger in the *Gfactor*Go systems, please see section 3.4 below.

Remove all other equipment and instruments from testing area. The *Gfactor*Go head form will rebound and can cause severe damage to other items or personnel.

Operating at an elevated temperature (105°F / 40.5°C) for an extended amount of time will cause the *Gfactor*Go to power off. Normal operation will resume when the *Gfactor*Go falls below this threshold.

Table of Contents

1.0 INTRODUCTION

The *Gfactor*Go "E" missile system is intended to be used to measure the impact attenuation of surfaces under and around playground equipment. The missile meets the dimensional requirements of:

ASTM F1292   ASTM F355   En1177   AS/NZS 4422   ASTM F3313

To promote effective use a *Gfactor*Go system must be properly configured and used by a properly trained operator.

The designation "E" missile refers to the missile shape and is described in ASTM F355. The "E" missile is hemispherical with a weight of 10.1 pounds. The missile is also commonly called the head form. Throughout this document and the referenced standards the terms "head form" and "missile" will be used interchangeably.

ASTM standards are available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA, 19428-2959, United States 610.832.9585

2.0 SYSTEM COMPONENTS

The *Gfactor*Go "E" missile system consists of the *Gfactor*Go hand held controller, a hemispherical missile and a drop handle. Also included with the *Gfactor*Go system are an 8" x 8" rubber reference pad, and battery charger. A fitted, wheeled carrying case is available for an additional US$ 425 at time of purchase.

The hand held controller is powered by an internal rechargeable NiMH battery, and records the results of drop tests. The LCD display will show the Peak G, HIC, angle of impact and time and date, while the impact velocity and HIC Interval (Delta T) are shown optionally. A memory card is used to store the results of up to 1000 drop tests, and allows the user to copy the drop test results to the included proprietary application program running on a Windows compatible platform for report generation and archival purposes.

Internal to the head form is a MEMS sensor (accelerometer) which produces electrical signals proportional to the G value of the head form's impact with the surface being tested. Circuitry inside the head form measures these voltages, calculates Peak G, HIC, impact angle and impact velocity and wirelessly transmits the results to the hand held for display.

CAUTION: To prevent injury never allow any person to stand beneath the missile when it is suspended from the handle, nor anywhere in the possible drop path of the missile.

The head form is powered by an internal rechargeable NiMH battery. Nickel Metal Hydride (NiMH) batteries are of a lower power density than Lithium Ion batteries thus allowing the system components to be transported by aircraft if required. Typical battery life on a full charge exceeds two months of substantial daily use.

3.0 HAND HELD UNIT
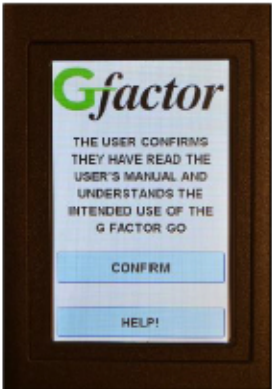
Photo 1 – *Gfactor*Go Hand Held

Micro SD Card slot

Power push button
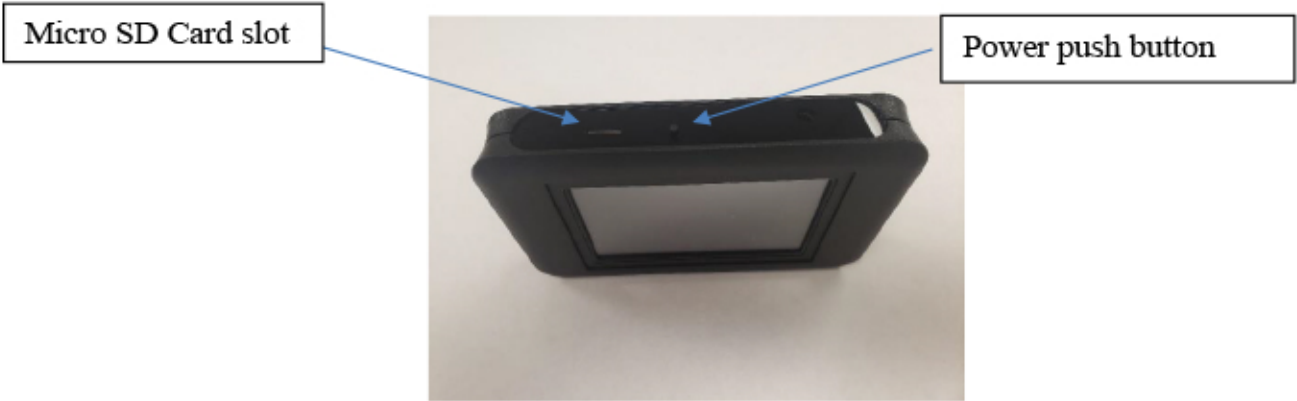
**Photo 2 – *Gfactor*Go Hand Held
Side view**

Photo 3 – Using a pen or pointed object, press the SD card in until it clicks. To remove, press SD card in and it will protrude.

PHOTO 4 – _Gfactor_Go hand held easily fits in the pocket

3.1 Power ON/OFF

Press the Power push button as seen in photo 2 to turn the hand held on. The following screen will appear.

Press confirm to begin testing.

To power system (hand held and head form) OFF, press and hold the OFF button. The operator will need to return to a drop screen to see the OFF button. Hand held will automatically turn off after 5 minutes of no use.

3.2 Hand Held to Missile Communications and conducting drops

The *Gfactor*Go uses wireless communication between the hand held and missile. As shipped from the factory each hand held is paired with a unique missile. After pressing the power button the head form and hand held will pair. The START key will show up when this is complete and the system is ready for testing.

The range of the *Gfactor*Go wireless communications is about 20 feet. Should the user try operation beyond this distance the communications between the missile and hand held will cease and the system will appear to be non-operational. Moving back into range will allow communications to resume after an approximately 30 second delay.

The *Gfactor*Go system does not support apps or communications with devices other than the missile and hand held, and any attempt to pair other devices could disrupt the factory pairing resulting in an inoperable system.

After powering on the *Gfactor*Go hand held and confirming the initial screen, the following screen appears:

Press the power button on the head form and it will pair with the hand held.

Prepare the drop by pressing GO

Insert Release Handle to arm system

Squeeze handle to release head form

3.3 Navigating Menus

From any drop, swiping LEFT or RIGHT will cycle through drops accordingly.
Swiping UP or DOWN will cycle through 10 drops at a time.

CM / FEET:
   Change units

FOLDER:
   Change folders. Each folder holds up to 100 drops

SET DATE + TIME:
   Set the date and time. Can also change to 24 hour format (ML time).

VIEW DROPS

Select a specific drop by pressing on the line it is on. To scroll through drops, press and hold either the top
line or bottom.

To view a drop, select the drop and press DETAIL.

Pressing GRAPH will bring up the graph for the drop

Swiping left or right will allow you to view other drops. Press GO BACK to go back to previous menu.

3.4 Batteries and Charger

The *Gfactor*Go hand held and missiles each make use of permanent internal rechargeable nickel metal hydride (NiMH) batteries. Each *Gfactor*Go system is supplied with a battery charger with technology matched to the NiMH batteries used. The batteries in both the hand held and missile requiring charging independently.

WARNING: USING A BATTERY CHARGER OTHER THAN THE ONE SUPPLIED WITH THE *Gfactor*Go SYSTEM COULD RESULT IN BATTERY DAMAGE, POSSIBLY RESULTING IN FIRE AND PROPERTY DAMAGE.

DO NOT ATTEMPT TO USE THE *Gfactor*Go WITH THE CHARGER CONNECTED!

To charge either the head form or hand held plug the charger into the charger receptacle and plug the charger in AC mains power. The charger runs on either 110VAC or 220VAC power without adjustment or additional power converters. Depending on the level of charge left in the battery up to two hours might be required for a full charge. When fully charged the LED will turn green. Note that the charger is protected from overcharging the battery and may be left connected after the LED turns green. If the charger is unplugged and immediately plugged back in, the LED will once again go from green to red. After a few minutes the LED will return to green.

4.0 "E" Missile

Photo 2 (below) shows the *Gfactor*Go "E" missile. The missile is machined of solid aluminum and designed and tested to be in conformance with applicable standards. The "E" missile is hemispherical with a weight of 10.1 pounds and diameter of 6.30 inches. The release hand inserts in the top of the head form. The head form also has a battery charger connection, and uses the same charger as the hand held. The charging port is protected by a black cover. The gray push button turns the head form on, and a red LED blinks to show the head form is operating.

CAUTION: To prevent injury never allow any person to stand beneath the missile when it is suspended, nor anywhere in the possible drop path of the missile.

NOTICE: The electronics inside the *Gfactor*Go missiles are sensitive to damage by water intrusion into the missile. To prevent damage to the *Gfactor*Go missiles they should not be used in rain or snow. The *Gfactor*Go missiles should also be stored in dry locations such as a heated office. Storage of the *Gfactor*Go missiles in damp locations such as basements and cellars must be avoided. Avoid any other storage location such as vehicles in cold climates which could promote condensation on the metal surfaces of the *Gfactor*Go missiles.

E Missile (HIC tester)

5.0 E Missile System Use

5.1 Performing Drop Tests

Refer to applicable standards to determine which locations and from which heights a drop test is to be performed.

To perform a drop test:

5.1.1. Turn the hand held unit on by pressing the push power button key on the side of the display. (see section 3.2) Press the gray push button on the top of the head form. The red LED will initially be on for 1 second and then flash briefly every two seconds.

5.1. 2. Select or confirm in which folder and drop number the drop test results will be recorded (see section 3.3)

5.1.3 Insert release handle to top of head form.

5.1.4 Confirm the distance from the bottom of the missile to the surface using an appropriate measuring device.

5.1.5 Press the GO key. A message will appear on the display indicating that the *Gfactor*Go is being prepared for the drop test. The first time the *Gfactor*Go is turned on after being turned off (or automatically turning itself off) please wait to until GO appears. It will prompt you to insert handle if the handle is not fully inserted.

If the hand held has not yet established communications with the head form START will not appear. As soon as connection has been established and after pressing START the hand held will display the battery charge (in percent of full charge) of the hand held and head form batteries. Note that a few seconds may be required for the charge display to stabilize. The battery charge will only be displayed before the first drop every time the system is turned on. To continue press any key, or wait 5 seconds for the display to advance automatically to normal operation.

To release the missile, squeeze the handle to immediately release the head form. Immediately after impact the Peak G, HIC, and HEIGHT will be displayed. NEXT DROP and RE-DROP will appear when saving of drop data is complete. Press NEXT DROP to advance and begin the next drop. RE-DROP will begin the next drop, the current drop will be overwritten.

WARNING: Depending on the surface being tested, slope of the surface and any surrounding structures, the missile might rebound off the surface in an unpredictable direction. Care must be taken to avoid injury from being struck by the rebounding missile.

NOTE: At any time while the *Gfactor*Go is preparing for a drop test, the test can be canceled by pressing the GO BACK key. The test will be canceled without changing any test results previously saved in the *Gfactor*Go memory.

_Gfactor_Go head form and release handle

5.2 Daily System Verification

Before performing drop tests the *Gfactor*Go must be tested to ensure that the system is functioning properly, as required by the applicable specifications. This test is performed by dropping the missile on a reference pad, which is supplied with the system. Appendix A details the procedure for this test. The test should be performed on a daily basis before starting surface tests. Not performing the prior to use test could render field data invalid if the subsequent verification test shows a non-compliance issue.

NOTE: Please Refer to the applicable standards for exact requirements.

5.3 Inspection of test result

Before continuing with the next drop test, the operator should briefly review the current test to detect any obvious problems or anomalies with the data.

5.4 Verify impact velocity
Compare the impact velocity as calculated to the theoretical velocity for the respective drop height. If impact velocity is not within limits, repeat the drop test.

The theoretical velocity may be calculated from the measured drop height:

Using Imperial units:

Velocity = 8.025 x square root (drop height)

Where the velocity is in feet per second (ft/sec) and the drop height is in feet

Using   Metric units:

Velocity = 44.27 x square root (drop height)

Where velocity is in centimeters per second (cm/sec) and drop height is in centimeters

6.0 Report Generation Application

The *Gfactor*Go system is supplied with a Windows compatible reporting application. This application can be used to upload drop test results and impact wave forms to a personal computer. The application allows the operator to generate reports of the drop test in both table and graph formats, and to enter comments describing the drop tests. The drop tests can also be saved to the computer's file system, allowing archival storage of test results.

6.1 Installation

The application is provided in the USERDOCS folder located on the Memory Card supplied with the *Gfactor*Go. It is suggested that this folder be copied to the user's PC, and an archival copy also be created.

Install the *Gfactor*Go host application on a Windows compatible platform by running the SETUP.EXE program supplied in the folder titled "Gfactor Manual App and Calibration Cert". The setup program will ask questions to properly install the software. If the setup program indicates that a file on the computer is newer than a file about to be installed by setup, click the setup option to keep the existing file on the computer.

The application program is provided as part of the *Gfactor*Go system and may be installed on as many computers as the operator desires. There are no license fees.

6.1 Installation Error Messages

NOTE: When installing the software on some computers several warning and error messages may appear. The first error message will warn the user that a file about to be copied is older than the file existing on the computer. Select the option to keep the existing file. Next, an error message may appear indicating an error has occurred and will prompt for Cancel, Retry or Ignore. Select the Ignore option and when prompted if you are sure you want to ignore this error select YES. For each of the next errors select the Ignore option. Despite these error messages the software will install correctly.

6.2 Uploading Test Results

All drop test results are stored on the *Gfactor*Go memory card, in one of ten available folders (root plus 9 folders.) To start remove the Memory Card from the *Gfactor*Go hand held and insert it into a memory card reader connected to the PC. An adapter for the Micro SD card is included in the system. Note that as some computers feature internal card readers one is not included with the *Gfactor*Go system. To use a computer not equipped with a card reader many low cost (less than US$20) models are available from local computer stores or online.

Before starting the *Gfactor*Go application insert the memory card in the computer's memory card reader. Start the *Gfactor*Go application and select the Memory Card top menu option, and then click Select Drops for Upload. A box will appear allowing the selection of which drops to upload. If it is unknown which drop

numbers have been data select all 100 drops. The application will attempt to load all 100 drops but will ignore drops for which there is no data.

Before clicking Upload, ensure that the location of the memory card and folder shown in the Memory Card Path box is correct. If not correct, click the Browse button and select the correct folder.
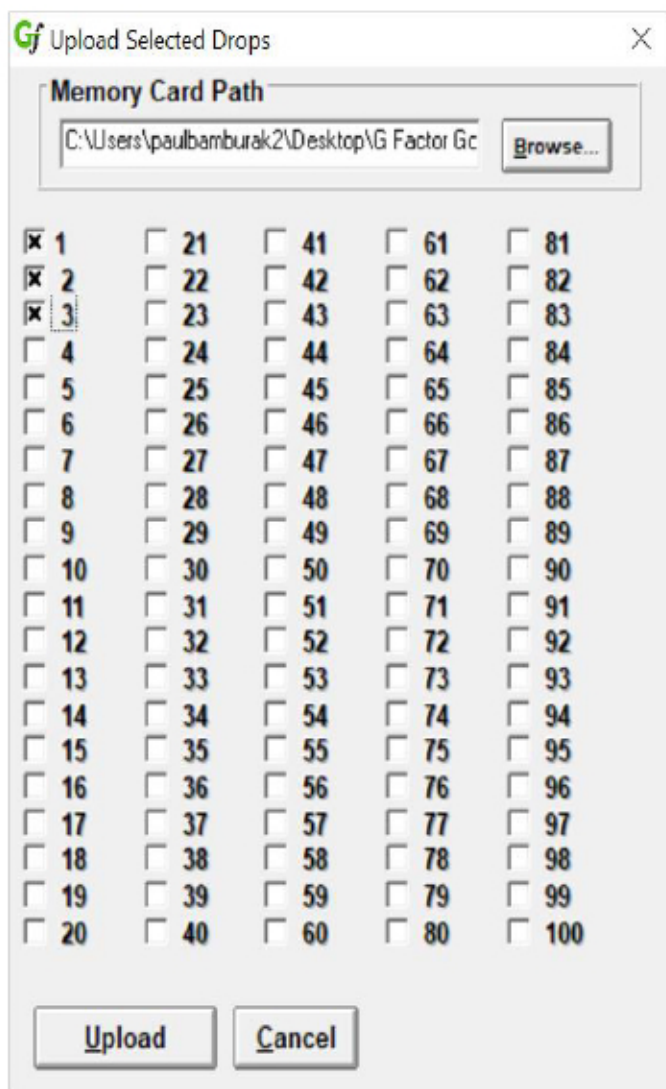
Tip: To select a group of consecutive drops, click the first desired drop and then hold the shift key while clicking the last desired drop. All drops between the specified first and last will be selected.

```
G Factor Drop Test Report                                    GfactorGO
                                                             powered by TRIAX

#    Peak      HIC      Ft/Sec     Date/Time          Comment
1    182       942      14.0       03/17/14 03:16p
2    181       937      14.0       03/17/14 03:17p
3    183       949      14.0       03/17/14 03:17p
4    191       882      14.0       03/17/14 03:18p
5    193       891      14.0       03/17/14 03:18p
6    189       874      14.0       03/17/14 03:18p
```

Each drop test is stored on the memory card in a proprietary file format. The file name for a drop test is DRPxxx.DRG where xxx will be replaced with the number of the drop (001 to 100.) After drop tests have been uploaded and saved on the PC, Windows Explorer may be used to delete the .DRG file so as to prevent confusion for the user during subsequent testing. The .DRG files do not need to be erased as the *Gfactor*Go hand held controller will overwrite old drop test files with new drop test files.

6.3 Adding individual comments to each drop

The report application allows comments to be added for each drop. Typical uses for comments would be to indicate the location on the surface the drop test was made, surface thickness, temperature or any observation particular to the specific drop. To add or edit a comment, click once on the desired drop and then press the ENTER key. A text box will appear allowing the adding of a new comment or editing of an existing comment for the selected drop. Press the ENTER key when complete.
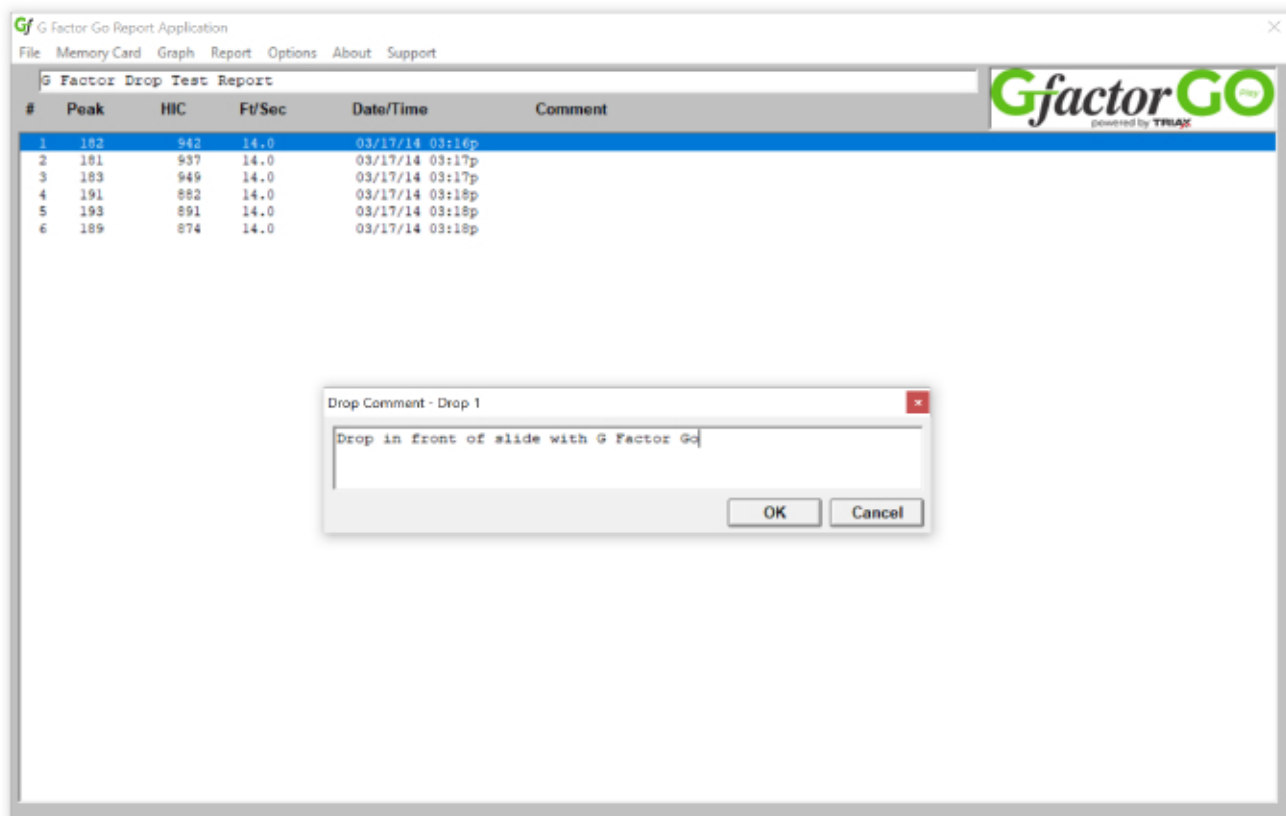
6.4 Adding a report comment

To add or edit a single comment to summarize all the drops within a report, double click on the text box immediately below the menu bar. A text box will appear allowing the adding of a new report comment or editing of an existing report comment. Press the ENTER key when complete.
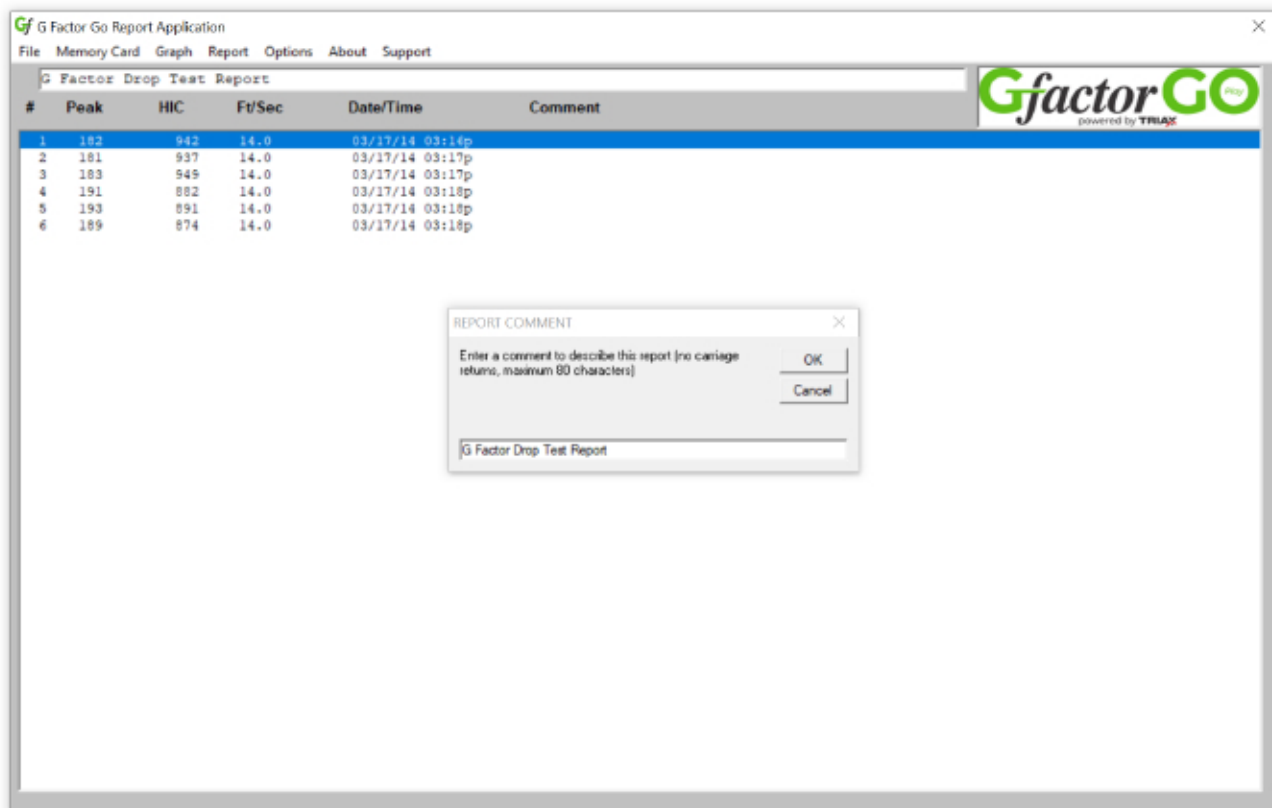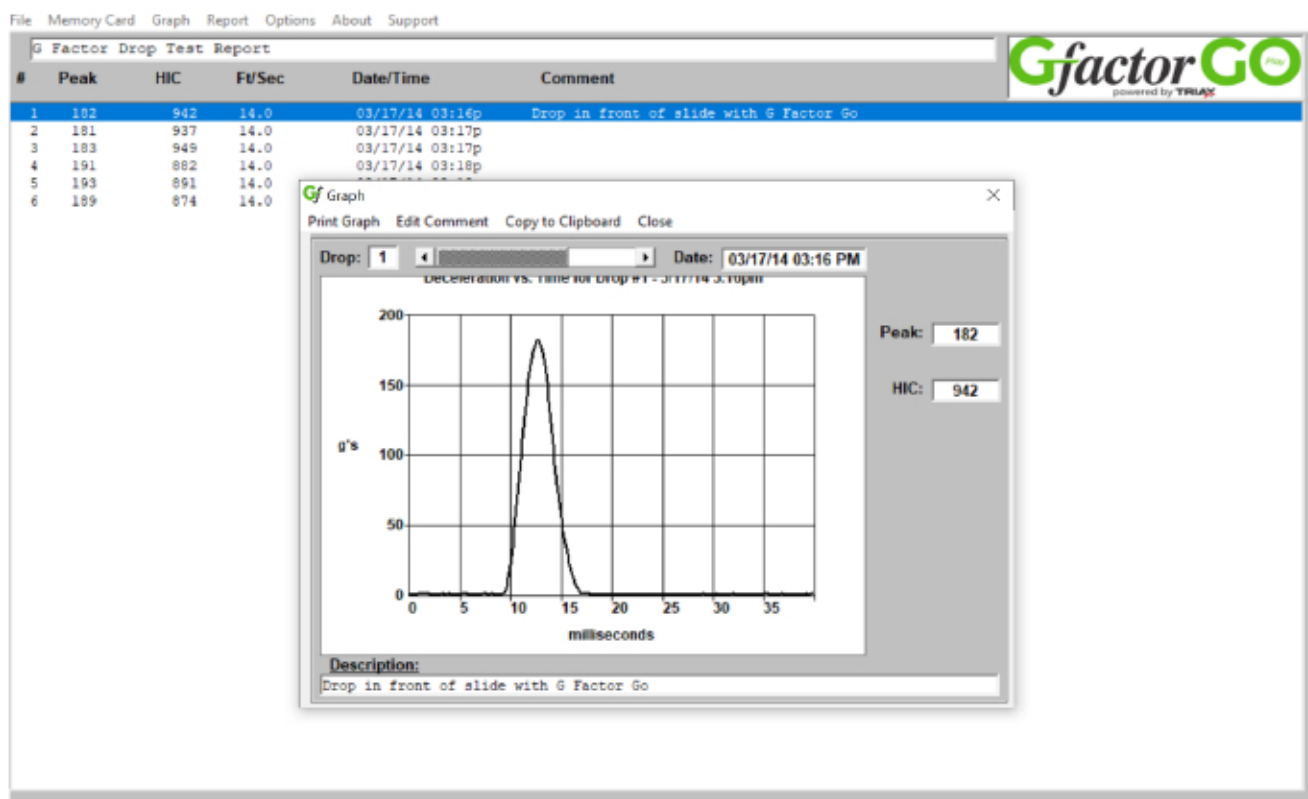
6.5 Viewing Impact Waveforms (Graphs)

To view the impact waveform, double click on the desired drop test.

6.6 Archiving Data

To archive test data, select Save to Data File under the File menu option. A text box will appear prompting for a file name to which all drop tests currently displayed will be saved as a single file. The files are saved in a proprietary format, with a file extension of .TRG

6.7 Retrieving Archived Data

To retrieve test data, select Load Data File under the File menu option. A text box will appear prompting for a file name from which all drop tests will be retrieved.

6.8 Options Menu

Several options are available under the Option menu item. This menu item is used to select which Windows system printer is used to print reports, the units of drop height or impact velocity to display, an optional title which will appear on printed reports and whether the HIC Interval will be displayed on reports.
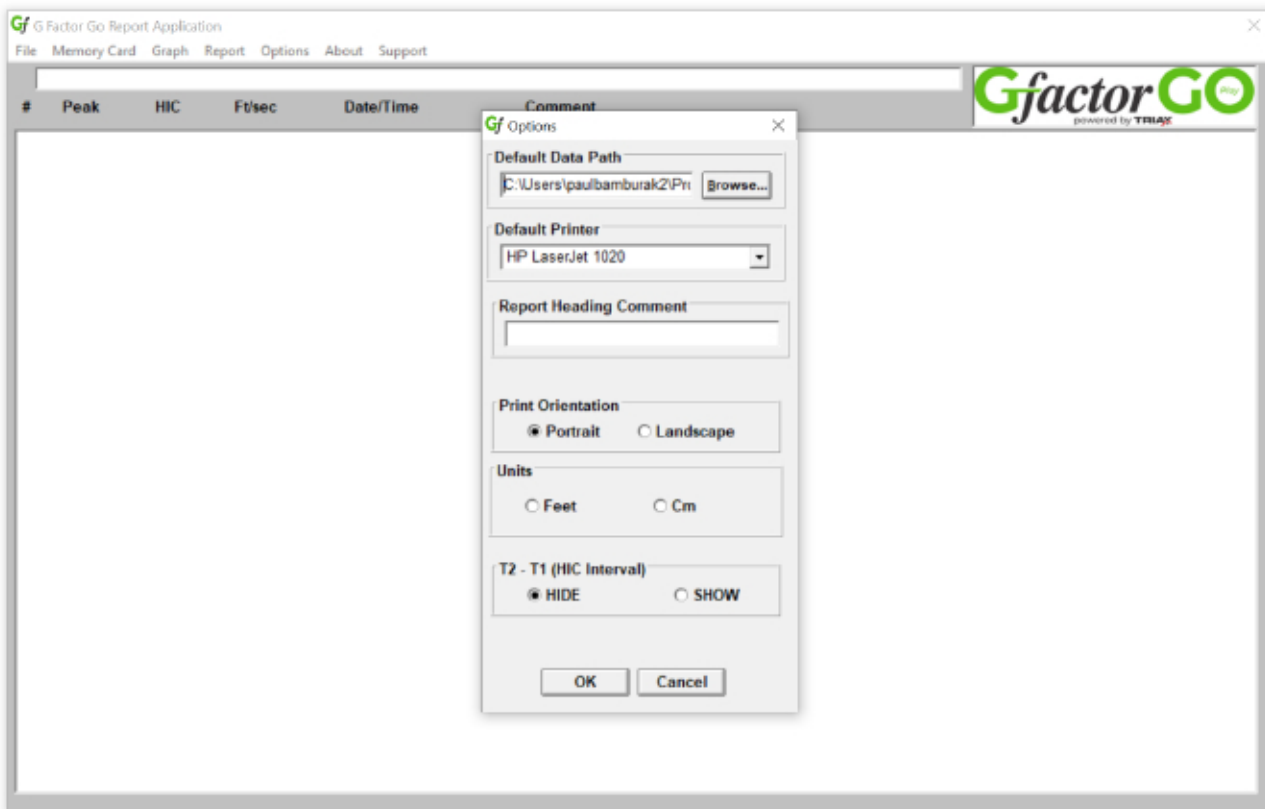
NOTE: The HIC Interval is a mathematically sophisticated technical detail regarding how the HIC was calculated for a given drop. Some new standards are using the HIC Interval as an added pass / fail criteria but it has not yet found wide use. Most users will want to leave the HIC Interval setting left to HIDE to prevent confusion.

6.9 Calculation of Critical Fall Height – EN1177 Method

For critical fall height (CFH) calculation as per EN1177 four drop tests must be performed, changing the drop height to result in increasing HIC values. The first two drop tests must result in HIC values below 1000 while the second two result in HIC values greater than 1000. The drops are uploaded as described in section 6.2, and selected by clicking on each of the four drops while holding the CTRL key.

From the Report drop down menu click Calculate Critical Height to view and print the CFH graph
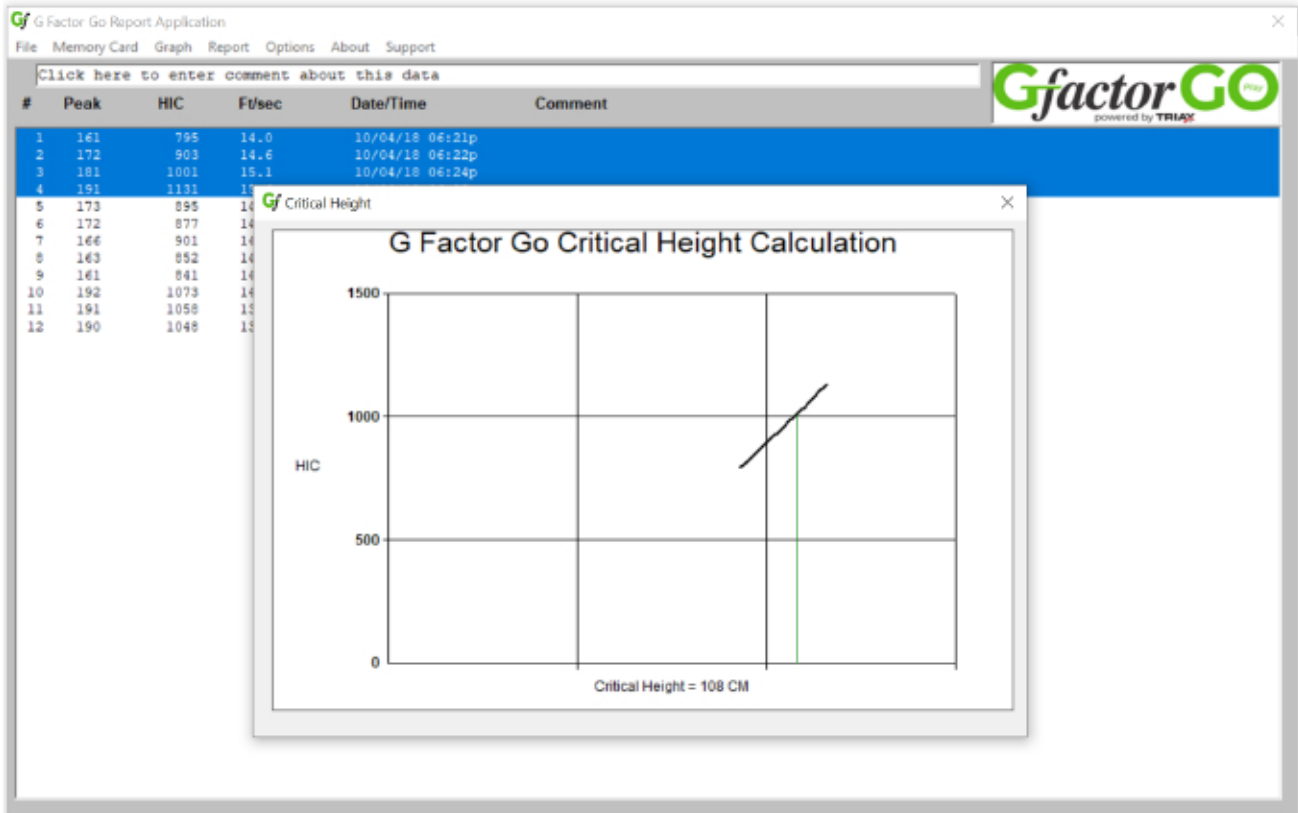
APPENDIX A

*Gfactor*Go VERIFICATION PROCEDURE AND CALIBRATION

A.1 Why use a reference pad?

The measurements made by the *Gfactor*Go are not easy to duplicate using other test equipment. As such there must be a means for a user to ensure that the instrument is working properly between factory calibrations. When a *Gfactor*Go is manufactured and tested at the factory and is in a known good condition, a series of drop tests are performed on an 8 inch (203 mm) square reference pad. The pad is then supplied with the respective *Gfactor*Go system and whenever the pad is retested by the user the results should agree, within an established tolerance (+/- 10%), with results originally obtained at the factory.

A.2 Establishing Initial Reference Pad Values

Subsurface conditions (i.e. the hardness and thickness of concrete) will affect the reference pad values and yield different values than the factory values. To fully utilize the reference pad, initial reference pad values for a particular subsurface must be obtained.

There are no user accessible means of performing calibration adjustments.

NOTE: The reference pad must be stored at normal room temperature and humidity conditions in order to provide reliable results. After transport or storage involved extended temperature or humidity allow the pad to acclimate to normal room condition for at least 12 hours.

A.2.1 Place reference pad on a bare concrete surface (no carpet or tile, painted is fine)

A.2.2 For a *Gfactor*Go E missile position the missile that the bottom of the missile is 36" +/- 1.0" (915mm +/- 25mm) above the surface of the reference mat. Verify height on hand held after each drop.

A.2.3 Perform three drop tests, waiting 1.5 minutes ±30 seconds between drops, averaging the Peak G results of the second and third drops. This average Peak G are the *Initial Reference Pad Averages* and should be recorded on the *Reference Pad Data Record* for future use. The measured Peak G should agree within +/- 10% of the average of the Peak G of drops 8 and 9 on the factory calibration report, ensuring that the system was not damaged during shipment or storage. The +/-10% window compensates for differences in the concrete floor between the factory and the user's locations.

If the Initial Reference Pad Averages are not within the specified range contact technical support before proceeding.

A.3 Daily Verification

Before subsequent use the of the *Gfactor*Go system the reference pad procedure (three drops at specified height) is to be repeated. The average of the second and third drop must be within +/- 10% of the Initial Reference Pad Averages (section A2).

If the *Initial Reference Pad Averages* are not within the specified range contact technical support before proceeding. When performing the reference pad procedure on surfaces other than that which was used to establish the Initial Reference Pad Averages variation greater than +/-10% may be observed. If in doubt contact technical support before proceeding.

NOTES:

1. Reference pad values should be recorded and be included in every test report.

2. There are no user accessible means of performing calibration or adjustments.

3. PEAK G values should be compared for reference drops, not HIC values.

A.4 Calibration

All electronic measuring instruments require initial and periodic calibration. Many instrument manufacturers recommend a calibration interval of one year. Due to the use of the reference pad procedure to verify instrument operation between factory calibration the *Gfactor*Go calibration interval is extended to two years. Users may elect to calibrate their instruments on the tradition one year (or shorter) interval as may be required by their respective quality or other policies.

A.5 Reference Pad Recording

The following page can be printed and used for recording reference pad results.

REFERENCE PAD DATA RECORD

*Gfactor*Go Hand Held Computer Serial Number: _____

*Gfactor*Go Head Form Serial Number: _____

*Gfactor*Go Reference Pad Number: _____

Date	Peak G	HIC	Temp	Comments
				Initial User Reference Pad Averages

APPENDIX B MEMORY CARD

The *Gfactor*Go stores drop test results on standard Memory Cards, one of which is included with each new *Gfactor*Go hand held controller. Several manufacturers offer Memory Cards of varying sizes and the *Gfactor*Go can be used with any card up to and including 32 gigabytes. Memory cards 64GB and above will not work in the *Gfactor*Go due to the EXFAT file systems used on these cards.

The *Gfactor*Go operation of the Memory Card is identical to the operation of the PC file system. Files and folders can be copied, deleted and created using standard PC applications such as Windows Explorer.

The *Gfactor*Go allows the user to store drop results in one of ten folders on memory card. When a new memory card without any folders is installed in the *Gfactor*Go drop test results will be stored in the ROOT folder (the folder is not actually called ROOT. If the memory card were installed in a PC and was called drive E: the ROOT folder would be "E:\")

B.1 Creating Folders on the Memory Card

Using Windows Explorer the user can create up to nine more folders on the memory card for storing drop test results. Folder names must be from 1 to 8 characters long and contain only upper case alpha (A – Z) and numeric (0 – 9) characters and should not have spaces (i.e. FOLDER1). Sub folders are not supported by the *Gfactor*Go file system.

B.2 Selecting Memory Card Folder

To select a folder into which to store drop test results, turn on the *Gfactor*Go and press the MENU key

Select FOLDER

Press NEXT to scroll down to the Folder you would like to use, then press SAVE AND GO BACK.

If the current folder is deleted (using a PC) upon turning the *Gfactor*Go on the user will be prompted to select a new folder. If a new folder is not selected the default ROOT folder will be used for drop test data.

If the memory card is not inserted into the *Gfactor*Go or the card is write locked, the user will be warned that no drop test data will be saved. Drop tests can still be performed and the results manually recorded by the user. In addition the *Gfactor*Go will not allow the user to access any drop other than drop 1.

With 100 drops in each of ten folders and memory card will hold a total of 1000 drops, requiring approximately 2.5 megabytes of storage. Although not recommended, the remainder of the memory card can be used for storing other user data without hindering operation of the *Gfactor*Go.

APPENDIX C

TROUBLESHOOTING

C.1 Batteries

The *Gfactor*Go hand held and missiles are powered by permanent internal NiMH batteries. Should the batteries become too weak for proper system operation the operator will be alerted by a message on the hand held display. To charge the batteries plug the charger supplied with the *Gfactor*Go system into the charger connector of the component to be charged and plug the charger into an AC outlet. While charging a red LED on the charger will be on. When the battery is fully charged this indicator will become green. A full charge requires approximately 120 minutes.

WARNING: DO NOT USE A BATTERY CHARGER OTHER THAN SUPPLIED WITH THE *Gfactor*Go SYSTEM. USING A BATTERY CHARGER OTHER THAN THE ONE SUPPLIED WITH THE *Gfactor*Go SYSTEM COULD RESULT IN BATTERY DAMAGE, POSSIBLY RESULTING IN FIRE AND PROPERTY DAMAGE.

C.2 Sensor Error

The sensor (accelerometer) in the head form is sensitive to moisture, such as condensation on the head form. Care should be taken to prevent condensation from forming on the head form, such as NOT storing the system in an unheated space or in the cargo area of a car or truck.

A sensor which has been affected by moisture will cause the SENSOR ERROR message to be displayed. In this case the head form should be removed to a warm area and allowed to dry for 3 to 4 days. Consult the factory for techniques to speed this process.

C.3 Memory Card Folder Names

When viewing the memory card files the names of the folders might appear incorrect, typically containing a percent sign (%) when not expected. The memory card folder names are limited and may only be eight characters long and contain only upper case letters (A − Z) and numbers (0 − 9.) Spaces, punctuation, underscores and other special characters are not allowed.

APPENDIX D

*Gfactor*Go MISSILE DIMENSIONS

D.1 "E" Missile

Weight	10.1 pounds, +/- 0.05 pounds
	4.60 kg, +/- 0.02 kg
Shape	Hemisphere
Diameter	6.30 inches, +/- 0.10 inches
	160 mm, +/- 2 mm
Material	6061-T6 aluminum, solid billet

APPENDIX E

WARRANTIES AND REPRESENTATIONS

Warranty: *Gfactor*Go is warranted for material and workmanship for a period of one (1) year from the date of shipping to the first purchaser of record. For repair the customer must return the system components requiring repair shipping prepaid to Alpha Automation, Inc. 127 Walters Avenue, Trenton, New Jersey 08638 USA

Representations: No representations are made other than those stated. This instrument is for data acquisition and it is the sole responsibility of the purchaser and user to determine its application in any particular circumstance. The purchaser and user of the Surface Impact Tester is directed to the Precision and Bias section of the ASTM F1292 and F355 standards in force at the time of manufacture of the instrument to clearly understand the variations, repeatability and reproducibility of the results.

The use of this instrument is invalid and not covered by any warranty or any representation should any of the conditions of compliance with ASTM F1292 and / or ASTM F355 in force at the time of manufacture, including, but not limited to periodic calibration, not be performed.

Certficates of compliance not lised below can be supplied upon request.

APPENDIX F

FCC RULES

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Certificate of Compliance

GfactorGO "E" MISSILE

The GfactorGo system for surface resiliency testing meets the dimensional requirements as stated in

ASTM F1292-18

Paul Bamburah 04/20/2020

Paul Bamburak, P.E.

● Engineers and Manufacturers ●
Electronic Instruments and Controls Precision Mechanisms

Certificate of Compliance

*Gfactor*GO "E" MISSILE

The GfactorGo system for surface resiliency testing meets the dimensional requirements as stated in

ASTM F3313-19

Paul Bamburak 04/20/2020

Paul Bamburak, P.E.

**alpha
automation**

alpha automation, inc.
125-127 Walters Avenue
Trenton, New Jersey 08638
609-882-0366 FAX 609-882-0382

Certificate of Compliance

G*factor*GO "E" MISSILE

*The G***factor***Go system for surface resiliency testing meets the dimensional requirements as stated in*

EUROPEAN STANDARD EN-1177:2018

Paul Bamburak   *04/20/2020*

Paul Bamburak, P.E.

● Engineers and Manufacturers ●
Electronic Instruments and Controls Precision Mechanisms

33

Certificate of CONFORMITY

Federal Communications Commission (FCC) CFR47 Telecommunications,
Part 15 Subpart C "Intentional Radiators" modular approval in accordance with Part
15.212 Modular Transmitter approval.

TRIAX IMPACT TEST SYSTEM

The Triax Impact Test System contains FCC ID: T9J-RN42

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.

Paul Bamburak   *June 15, 2020*

Paul Bamburak, P.E.