HOGGAN SCIENTIFIC, LLC.

ergoFET®

Push Pull Force Gauge

User Guide

Table of Contents **Page**

HOGGAN SCIENTIFIC, LLC.

ergoFET® System

DESCRIPTION

The ergoFET® is a wireless-capable push pull force gauge that measures the tension or compression peak force applied to transducer pad or hook and its duration during any test.

HOW SUPPLIED

- **ergoFET®** Wireless Digital Force Gauge (5056)
- Flat/Round Transducer Pad
- Large Curved Transducer Pad
- Small Round Flat Transducer Tip
- Stir Up Handle
- 16 Inch Strap with “D” Rings
- Open End Stationary Hook
- #2 Hook with Clasp
- Adapter Base
- 4 Inch Extension Rod
- Rechargeable Lithium-ion Battery
- Power Supply (Battery Charger)
- User Guide
- Calibration certificate
- Carrying Case
- Optional – Bluetooth / FET Stick (Included with software package when ordered)

Figure 1: The ergoFET® device in supplied carry case

WARNINGS AND PRECAUTIONS:

- **The ergoFET® device should only be used by trained professionals.**
- **The ergoFET® device and accessories are provided non-sterile and are not compatible with autoclave or other sterilization techniques. Do not autoclave.**
- **Use only a factory supplied wall pack power supply, charger. Use of another charger may result in electrical shock or equipment damage.**
- **ergoFET® devices are not intended for use while attached to wall pack power supply, charger. Never attempt to operate the instrument while it is connected to the charger as electrical shock or damage to the instrument may occur.**
- **The ergoFET® device is not protected against ingress of liquids. Keep device dry. Do not immerse the ergoFET® device or accessories in water.**
- **When in use device should be used on top of clothing.**
- **Discontinue use of any product if skin irritation develops.**
- **The ergoFET® is a precision device. Device should be treated with care. Do not drop, bang or hit or cause other impact to the device.**
- **Not recommended for use in extreme temperatures.**
- **Applied part is ergoFET® device with a transducer pad attached.**

- **Do not dispose of ergoFET® device in fire. ergoFET® device contains lithium-ion battery.**
- **Device is not known to contain any hazardous materials. For proper disposal instructions, consult your local waste management facility. Recycling should be used where available.**
- **Hoggan Scientific ergoFET® and USB dongle should not be used while stacked on, or adjacent to, other electrical equipment. If ergoFET® is stacked or adjacent to other electrical equipment; all electrical equipment should be checked to confirm normal operation.**
- **Rechargeable lithium-ion battery is only serviceable part.**
- **Do not service the battery while in use with patient.**
- **Making any modifications or using any accessories not specifically approved by Hoggan Scientific, LLC may void the warranty as well as reduce immunity to electromagnetic interference, or increase electromagnetic emissions, and result in improper operation.**
- **The use of portable and mobile Bluetooth (RF) equipment:**
  - **A. Can possibly affect medical electrical equipment normal operation.**
  - **B. The RESPONSIBLE ORGANIZATION (Professionals) should identify, analyze, evaluate and control related risks.**
  - **C. RESPONSIBLE ORGANIZATION - Changes to IT-**
  - **D. Network (Updates or upgrades to the ergoFET® device, changes to the IT Network Configuration, connections, or disconnections of items to the IT Network) could introduce new risks that require additional analysis.**
- **Electrical Equipment needs special precautions regarding EMC. ergoFET® needs to be installed and put into service according to the information provided in this manual.**

DIRECTIONS FOR USE

OPERATING FEATURES

- On/Off Switch – turns device on or off.
- Sleep Mode – The device enters a low power mode after being left on for three minutes. The device can be awoken by turning off the power for at least five minutes or pressing the reset button.

Reset Button – (see Figure 2). The reset button activates the ergoFET® and reinitializes the device for testing. It is not necessary to reset after each test but may be necessary to clear false readings caused by static discharge.

Figure 2. Device Buttons

- Threshold Button – (See Figure 2) Controls the amount of force required when the ergoFET® device begins and ends recording of test data.
- LCD Windows – Display Test Results and Option Settings.
    - Peak Force – Displays peak force of test
    - Duration – Displays the duration of the test

GENERAL USE

- Read all instructions before use.
  Select the appropriate transducer pad or hook accessory attachment part for the test being performed: Flat Pad for flat surfaces, curved pad for rounded surfaces, and algometer tip for small surface areas, open-end hook or clasp hook. Stir up handle can be used in conjunction with other attachment parts for one hand or two hand push or pull tests.
    - Note: If using clasp hook, or extension rod in conjunction with clasp hook, connect adapter base to device first.
- Attach appropriate transducer pad or hook accessory attachment part to device, by screwing the transducer pad or hook onto the threaded stud on device. Hand tighten to snug fit but do not over tighten.
- To perform one hand direct compression/push test, secure the ergoFET device in your hand by placing the elastic strap over your hand (See Figure 8).
- Switch the power button to the “On” position.

- Begin test with device by applying force, load. Live readings will begin displaying in LCD windows on device when force applied goes above the selected threshold setting.
- End of the test occurs when the force goes below the threshold setting and timer stops. After the timer stops, peak force and duration (time) are displayed in LCD windows (see Figure 5). Duration is calculated as the time (seconds) from the beginning of test when applied force goes above the threshold setting, and at the end of test when force goes below the threshold setting.
- To begin another test, apply force/load with device. The device will automatically clear previous test results and begins recording data for new test. Pressing the Reset button will also clear previous test results and display zeroes in both LCD display windows for start of new test.
- Up to 30 previous stored test results can be accessed. See Data Retrieval Mode instructions below.

DATA RETRIEVAL MODE (View Saved Tests)

- With the device in the test mode (displaying zeroes in both display windows), hold down the threshold button and click the reset button, this puts the device in data retrieval mode.
- The device will display the peak force (in the peak force window), test number (in the left hand side of the duration window), and duration of the test (in the right hand side of the duration window) See Figure 3).

Figure 3. Data Retrieval Mode Test Result Display Example

- Press the threshold button to cycle through the stored test results (up to 30).
- For tests shorter than 10 seconds, a decimal point will appear for the duration.
- For tests longer than 10 seconds, no decimal point will appear for the duration.
- To delete saved tests, hold down threshold button and click reset button twice.

- Note: If wireless or RF mode is powered on (wireless mode turned on for use of device with software), device will not save and store tests.

ergoFET® WIRELESS OPERATION

The ergoFET® can wirelessly transfer data to optional software if desired by the user. Wireless mode setting operation can only be used in conjunction with purchased software.

- To turn the wireless mode on, hold down the threshold button for ten (10) seconds.
- The device will enter force unit of measure setting mode after five (5) seconds, continue to hold down the threshold button until the peak force display shows “rF”, this is the wireless power setting menu (see Figure 4).

Figure 4. Wireless Mode Setting

- The duration screen will display the current wireless power mode as “On” or “Off”.
- Toggle the wireless power setting by pressing the threshold button to select wireless “On” or “Off”.
- Press the reset button. Pressing reset saves the setting in eprom memory, and returns the device to test mode.

If the ergoFET® device is to be used with the optional software, software setup and USB driver installation is required. Please refer to software and USB driver set up instructions included with software package purchase.

THRESHOLD SETTINGS

- The device threshold determines the minimum force required before the begins recording test data as shown in the table below.

Threshold Setting	High	Low
Force Required to Start Test	3 lbf 12.1 N	0.8 lbf 3.6 N
Measurement	Up to 300 lbf in 0.1 lbf increments (1320 N in 0.44 N increments)	
When to Use	Normal Use – Reduces False Starts	Applications requiring low force readings

- The current threshold setting is displayed as either an “L” or “H” on the left side of the duration window. Figure 5 shows the device in Low Threshold Setting.

Figure 5. LCD Display Windows /Threshold Setting and Sample Test Results

- The threshold can be toggled between high and low by pressing the threshold button (see Figure 2) when the device is in test mode. During testing, live force and time readings will display in LCD windows when the force being applied goes above the threshold selected, and ends when force goes below the threshold.

FORCE MEASUREMENT SETTINGS

- The force unit of measure may be changed between Pounds, Newtons, and Kilogram force.
- With the device in test mode, hold down the threshold button for five seconds, this puts the device in force unit of measure mode.
- The Peak Force display will then display a hash mark next to the current measurement unit in the peak force window (See Figure 6).

Figure 6. Force Measurement Mode

- Press the threshold button to toggle through the available units of measure. Select desired unit of measure.
- Press the reset button. Pressing reset saves the setting in eprom memory, and returns the device to test mode.

BATTERY CHECK

- With the device powered on in test mode, hold down the threshold button and click the reset button.
- Continue to hold the threshold button for five seconds. The device will display "P" in the peak force window and a number from 1 to 100 in the duration window. The number in the duration window indicates the battery charge in percentage (See Figure 7).

Figure 7. Power Check Display

- The device will return to data retrieval mode after five seconds. To regain access to battery check, hold the threshold button for five seconds.
- To return to test mode, press the reset button.

TESTING

For best results:

- Be sure to select the proper attachment(s) for testing being performed.
- Check to ensure that attachment(s) are properly and securely affixed to device.
- Check that the device is properly positioned for maximum surface area contact and direct force application for compression tests.
- The device is designed for axial loads only. Do not apply side loads to the device. Take precautions to ensure load is applied axially, perpendicular to the load, force applied.

The ergoFET® can be secured and held in either the left or right hand for compression testing, or you may switch hands from test to test, depending on stabilization requirements. To secure the ergoFET in your hand, place the elastic strap over your hand, and perform one hand direct compression/push test (See Figure 8).

Figure 8. Compression/Push Test Device Secured to Hand

For tension or compression testing not involving direct force application with the hand, the stir up handle can be used in conjunction with appropriate transducer pad or hook being used for tension and compression tests. The stir up handle can also be used with two hands in certain applications.

To insert handle, push aside strap on underside of gauge. The screw insert is located on the underside of the gauge. Thread the screw portion of handle into the insert and tighten until snug. Do not over tighten. See (Figure 10) for attaching handle to gauge.

Figure 10. Threading Stir Up Handle Into Screw Insert on Base

While ergoFET can be used with stir up handle for one hand push, pull, and lift tests, below are examples of the ergoFET® with stir up handle using two hands to perform a push test, pull test, and lifting to weigh contents of container (See figures 11, 12, 13).

Figure 11. Example Push Test

Figure 12. Example Pull Test

Figure 13. Example Lift Test

LOW BATTERY INDICATOR

Blinking readouts in LCD displays or unlit segments of the LCD display are indications that the ergoFET® battery power may be low. If LCD displays still blink or unlit segments remain after pressing Reset, the battery should be charged.

To avoid testing interruptions due to low battery power, we recommend that you check remaining battery power regularly, and re-charge battery when reaches approximately 15% power level. To check battery power, follow the battery check instructions.

CHARGING THE BATTERY

- To charge the battery, unscrew the transducer test pad to remove from the device.
- Insert the barrel connector from the wall pack transformer into the power connector that is located under the attachment. (See power connector on ergoFET®, Figure 14).
- If the device is turned on the right display will show the battery power while the battery is charging.
- When the battery power reaches 100% then the battery is fully charged.
- To check battery level charge, turn power button to On position.
- If device is stored longer than 30 days, check battery power level and recharge battery before using if necessary.

Caution: *Only use power supply provided by manufacturer:*
Caution: *The power supply is the disconnect device and shall remain readily accessible for easy disconnection.*

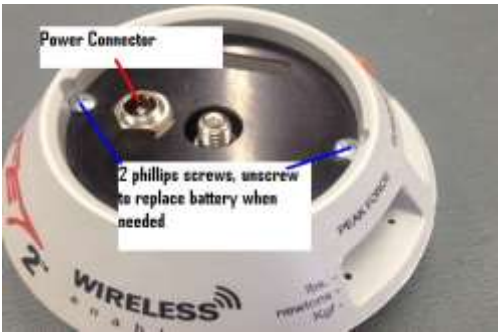


Figure 14. Device Charging and Battery Access

REPLACING THE BATTERY

When replacing rechargeable battery, use only rechargeable battery supplied by Hoggan Scientific: Model ICR14250 (1) 3.7V 1/2 AA lithium-ion rechargeable battery, 280 mAH. Other batteries may cause damage to device and void warranty. These batteries can be purchased from Hoggan Scientific LLC. To change the battery:

- When replacing battery, do not touch the internal circuitry, battery, and patient simultaneously.
- Remove the attachment from the device. Carefully remove the 2 Philips head screws from the battery cover (see Figure 14).
- Pull the battery cover up and rotate to the side to allow access to the battery.
- When installing new battery, make sure the positive (+) post of battery aligns with the (+) mark on the erggoFET® pc board (see Figure 15).
- Check power level of rechargeable battery to see if needs charging before use.
- If after installing replacement battery, the segments do not light up in LCD displays, please contact Hoggan Scientific LLC Customer Service Department at ph: 800-678-7888 / 801-572-6500.

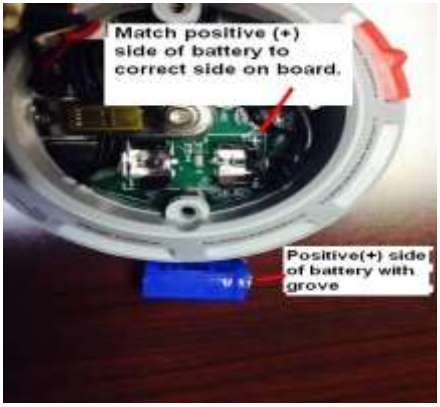


Figure 15. Battery Replacement

STORAGE AND TRANSPORTING

The ergoFET® is provided with a hard sided protective carry case. It is recommended to keep the device in this case when in transportation or when not in use. Store the device in a cool dry location.

SERVICE, MAINTENANCE, AND CLEANING

Your ergoFET® is built to provide long lasting, reliable service. As with any precision instrument, it should be used with care. It should not be dropped, banged against hard surfaces, or used as scale.

The exterior surface of the ergoFET® can be cleaned with soft cloth dampened with clean water. We recommend that you periodically inspect your device for wear, and proper functioning.

Caution: Do not immerse ergoFET® or accessories in water or other fluids or liquids. Device is not protected against moisture, water, or liquids.

DEVICE DISPOSAL:

Follow electronic device disposal guidelines when disposing of used device. There are no special risks related to the disposal of these devices.

USE LIFE:

The ergoFET® is designed to provide long lasting reliable service. Improper use, dropping, banging or mistreatment of the device will likely shorten its functioning Use Life.

CALIBRATION:

The ergoFET® comes with calibration certificate, ensuring that the device was properly calibrated at the time of shipment. To ensure continued accuracy and reliability, your ergoFET® device should be recalibrated annually, by properly authorized Hoggan Scientific, LLC service technicians.

WARRANTY

The ergoFET® is warranted for a period of one (1) year from the time of purchase. If the ergoFET® fails to operate because of defect in materials or workmanship at any time within one (1) year of the purchase date, it will be repaired free of charge by Hoggan Scientific LLC. (return shipping not included). Extended warranties are available at an additional fee.

If you wish to purchase an extended warranty after the purchase of your microFET®2, there is a 30 day grace period to purchase an extended warranty package. Contact Hoggan Scientific, LLC for more information.

WARRANTY REGISTRATION

To ensure your warranty is in force, please visit the website and complete your online product warranty registration at https://hogganscientific.com/warranty-registration/. Please save proof of your original purchase information for reference, such as your sales order, invoice, credit card voucher, or cancelled check to establish the warranty period.

WARRANTY REPAIRS

Before deciding that your ergoFET® is inoperable or defective, please review and follow the information in this instruction booklet.

In the unlikely event your ergoFET® becomes inoperable, please contact Hoggan Scientific, LLC to arrange to have the equipment repaired. Hoggan Scientific, LLC reserves the right to repair or replace the device with new or refurbished parts or equipment**.**

Hoggan Scientific Customer Service Department can be contacted at 800-678-7888, or by email at sales@hogganscientific.com. When Hoggan Scientific Customer Service Representative authorizes return of the product, you will be given Return Merchandise Authorization (RMA) number. Please include the RMA number with your device. For confirmed warranty repairs, the customer is responsible for the applicable shipping costs and shipping to Hoggan Scientific.

WARRANTY EXCLUSIONS AND LIMITATIONS

The ergoFET® warranty does not cover damage by negligence, misuse, or accident. Damage or device failure caused by modifications or repairs other than those approved by Hoggan Scientific, LLC or its authorized repair agent, or damage to equipment resulting from improper installation or operation is not covered. Any warning or instructional labels or decals must remain on the device for the warranty to be valid.

This warranty applies to the original purchaser. Some states do not allow the exclusion or limitation of incidental or consequential damages, in which case the exclusions and limitations may not apply. This warranty gives specific legal rights, and may also have other rights, which vary from state to state. To determine the legal rights in your state, consult your local or state consumer affairs office or State Attorney General.

CUSTOMER SERVICE AND REPAIRS

Customer satisfaction is important to Hoggan Scientific, LLC. We are happy to assist with questions, problems, or service issues on any Hoggan Scientific products you may own. Our business has grown on the basis of excellent product quality and customer satisfaction. Our fulltime customer service representatives are available from 7:00 am to 4:30 pm MST Monday-Thursday MDT, and 7:00 am to 1:30 pm Friday, MDT at 800-678-7888/801-572-6500 to meet your needs.
You can also contact Hoggan Scientific online regarding your customer service issue or calibration needs by e-mailing to sales@hogganscientific.com .

Service life of device is 10 years. End of service life is determined by date of first completed calibration of device.

ORDERING REPLACEMENT PARTS

Hoggan Scientific Products are manufactured to exacting specifications. When replacing worn or damaged parts, use only original parts supplied by Hoggan Scientific. The use of substitute or unauthorized parts will void your warranty and may increase the possibility of injury to the user or cause additional damage to the device.
When ordering Replacement Parts, please take the device out of service, and complete the following:

- Identify the brand, model, and serial number, and note the device function.
- Identify and document the problem and the worn or missing parts.
- Contact Hoggan Scientific LLC. Replacement parts (attachments) will be shipped directly from Hoggan Scientific.

All repair services will be performed at Hoggan Scientific LLC Manufacturing plant.

Except for replacing battery, do not attempt to repair device. Attempted repairs will void all warranties.

Batteries and replacement parts can be ordered either by calling Hoggan Scientific LLC, or order online at www.hogganscientific.com.

ergoFET® SPECIFICATIONS:

- Weight: 1 lb.
- Internal Power Source – Battery: Model ICR14520 user serviceable, 3.7 volt 1/2 AA lithium ion rechargeable battery 280 mAH.
- Controls: On/Off, Reset, Threshold.
- Operating Temperature: 52 - 92 degrees Fahrenheit (11 – 33 degrees Celsius).
- Humidity: 30-80% non-condensing.
- Atmospheric Pressure: 800 hPA – 1060 hPA. (11.60 psi – 15.37 psi).
- Recharge Time: Three (3) continuous hours of charging.
- Power Supply: Input - 100-240V. Output – 1A. 5 volt DC regulated.
- Maximum Force Capacity: 300 lbs Tension and Compression (136 kgf / 1320 Newtons).
  Test Range:
    - Low Threshold 0.8 lbs to 300 lbs in 0.1 lb. increments. Metric Newtons: 3.6N to 1320N in 0.4N increments. KGF (kilograms force): 0.4kgf to 135kgf in .1kgf increments.
    - High Threshold 3.0 lbs to 300 lbs in 0.1 lb increments. Metric Newtons: 12.1N to 1320N in 0.4 N increments. KGF: 1.4kgf to 135kgf in 0.1 kgf increments.
- Wireless Frequency Operating Distance: 25 feet / 7.6 meters from receiver, indoor environment.
- Accuracy: Within 1% of reading.
- Data Storage Stores 30 most recent tests.
- FCC ID: T9J-RN42.
- Radio Frequency: 2.4 GHz.

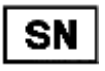
DEVICE CLASSIFICATIONS

Classifications: Class II
Type B Applied Part
Mode of Operation: Continuous
IPX0 (Do Not Wet the Device)

Device complies with:
IEC 60601-1-2:2014 (EMC)
IEC 61000-4-2 (2008)
IEC 61000-4-3 (2006), A1:(2007), +A2:(2010)
IEC 61000-4-8 (2009)
CISPR 11 Emissions Class B (2009), +A1:2010
Radiated Emissions Conducted Emissions
FCC Part 15B

TECHNICAL ASSISTANCE:
For further assistance, contact Hoggan Scientific at:
Phone: 800-678-7888 / 801-572-6500
Email: sales@hogganscientific.com
Website: www.hogganscientific.com

GRAPHIC SYMBOLS AND DEFINITIONS

						
Device will not work when connected to AC outlet	Device is provided non-sterile	Attention, See Instructions for Use	Model number	Serial Number	Keep Dry	Manu-facturer
IPX0						
Do not wet the device	Class II Electrical Equipment	Type B applied part – External Body only contact	FCC Com-pliant Device	Radio Fre-quency	Direct Current	

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