



# HTM-121

**Handheld Digital  
Teslameter  
with HHP-101  
Hall Effect Probe**

**Made in New Zealand**

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## INTRODUCTION

Thank you for purchasing and using a Group3 Handheld Digital Teslameter and Hall Effect Probe. We hope you will join the many thousands of users worldwide who are enthusiastic about our products.

The HTM-121 Handheld Teslameter and its accompanying HHP-101 Handheld Probe is the latest product of Group3 and presents an advanced suite of magnetic field measuring technology. Designed for professionals who demand precision and reliability, these devices are integral tools for accurately measuring magnetic fields and temperature across various environments.

The Handheld Teslameter is an advanced portable equipment and engineered with cutting-edge technology. This versatile device is ideal for both laboratory and field applications. Key features of the handheld teslameter include:

- **LabView VI Interface:** Seamlessly integrates with LabView software running on Windows PC, providing users with an intuitive platform for real-time data analysis and system control. The VI is capable of data logging temperature-compensated magnetic field measurements readings over time that ensure all collected data is securely saved for later analysis. Real-Time Graphical Display, featuring a dynamic graphical representation of magnetic field readings, provides users with a clear and immediate visualization of the data enhancing the accuracy of measurements and decision-making processes.
- **Rechargeable Battery-Operated:** Equipped with a long-lasting Ni-MH rechargeable battery, the device ensures uninterrupted operation during extended measurement sessions, making it highly convenient for mobile use. It charges from the USB port.
- **Digital OLED Display:** It boasts a bright yellow OLED display, providing clear and sharp visual representation of readings, even in low-light conditions.
- **Tactile Keypad:** The teslameter is designed with a user-friendly tactile keypad, allowing for easy and precise input, even in demanding environments.
- **USB Connectivity:** The built-in USB port enables efficient communication with computers, facilitating quick data transfer and integration with the LabView interface for enhanced data management.
- **Option of either an aluminum or 3D printed nylon enclosure.**
- **Comes with a durable ABS carry case for transport convenience, safety and security.**

Complementing the teslameter, the HHP-101 Handheld Hall Probe is equipped with a GaAs Hall sensor and associated components specifically designed for detecting magnetic fields and is temperature compensated. This probe enhances the overall system's performance, delivering precise and reliable readings. To ensure a level of accuracy, both the teslameter and the probe are calibrated with rigorous standards, maintaining the integrity of measurements across a wide range of conditions.

Together, HTM-121 Handheld Teslameter and HHP-101 Handheld Hall Probe offer a high performance, reliable solution for professionals in research, quality control, and industrial applications, ensuring precise readings and long-term stability in every measurement task.

Group3 has been designing and building magnetic field measuring equipment since 1983. We are constantly upgrading our products and supporting documentation. We welcome input from our customers, so if there are aspects of the instrument which you particularly like, or which you would like to see improved, please contact your Group3 supplier (see back page for a complete list) or Group3 directly with your suggestions to [sales@group3technology.com](mailto:sales@group3technology.com).

The Group3 website, [www.group3technology.com](http://www.group3technology.com) contains details of all our products.

This site is regularly updated, so check it from time to time to learn about recent developments.

# Specifications of HTM-121 Teslameter and HHP-101 Probe

<b>Teslameter</b>	Model <b>HTM-121</b>
Material:	Anodized, Black aluminum shell
Keypad:	Tactile
Display:	OLED, with large field reading, temperature, and battery level and charging indicator
Operating Unit:	Gauss or Tesla
Temperature:	°C or °F
Dimensions:	207 x 103 x 60mm
Weight (Net):	0.8Kg, 1.5Kg (with carry case)

<b>Probe</b>	Model <b>HHP-101</b>
Material:	Solid-state GaAs-material sensor
Active Area:	0.2 x 0.2mm
Cross- section:	131 long x 6.2 wide x 1.1mm thick
Total Length:	250mm
Sensor Position:	3.0mm from center of active area to end of probe
Cable length:	2 meters (standard)

## Output:

Basic Accuracy:	<b>± 1.0% of full scale</b> (combined contribution of probe and teslameter)
Measurement Rate:	60 Readings per second

## Operating Conditions:

Magnetic Field:	bipolar field range, <b>calibrated up to ±2.2T</b>
Temperature:	-5°C to 50°C

<b>Battery Life:</b>	Battery Life of approx. 20 hours at full charge (Battery discharge rate approx. 5% per hour if continuously ON)
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## Features:

- Independently Calibrated Teslameter & Hall Probe **up to ±2.2T**
- Data logging via LabView VI
- HHP-101 Probes can be interchangeable to any HTM-121 Teslameter
- Calibration factors of the probe is stored in an SPI EEPROM inside the probe handle.

## Power Input Requirement:

- 5VDC, Rechargeable 2 x AA Ni-MH batteries via USB 2.0 port providing a capacity of 2500mAh.

**Supplied Accessories:**

- USB cable for charging & data communication
- LabView Runtime Version and VI Supplied
- HHP-101 Hall Effect Probe
- Hardshell Carry Case

**Enclosure****HTM Teslameter:**

- Anodized, Black aluminum shell, 207 x 103 x 60 mm,

**HHP Probe:**

- Anodized, Black aluminum case

**PERSONAL SAFETY WARNING:**

- Be aware of your surroundings when using the probe and teslameter especially in hazardous environment as it may touch live electrical supplies or be caught in moving machinery or objects.
- Ensure you have adequate personal protective equipment when using the instrument.
- Do not use the equipment if the battery is found to be defective nor attempt to open and repair the unit.
- Always practice safe use of equipment.

## HTM-121 Handheld Digital Teslameter Features



### KEYPAD CONTROL KEYS

1	Power Button	Press for 3 secs to turn ON and OFF the unit
2	MENU button	Shows the Units, Relative Mode, and Serial Comms.
3	ENTER button	Enter key
4	AC/DC Button	AC/RMS or DC voltage supply
5	Gauss/Tesla Button	Press to choose either Gauss or Tesla measurement
6	Rel. Zero Button	Press to choose Absolute value or the Relative Zero mode: Sampled & Stored
7	Min. Reset Button	Resetting the minimum field indicator
8	Max. Reset Button	Resetting the maximum field indicator
9	HOLD Button	Pressing Hold button to pause/hold the field reading measurement.
10	Arrow Keys Button	Arrow keys use for selecting command
11	Back Button	Command to return to the previous screen.

#### Note:

**RESET Unit** - Press Up and Down arrow keys simultaneously, then press ENTER to do a unit **RESET**.  
To **Powering ON or OFF** the HTM-121, press the Power button for 3 seconds.

## HTM-121 Handheld Digital Teslameter Features



### HANDHELD DISPLAY

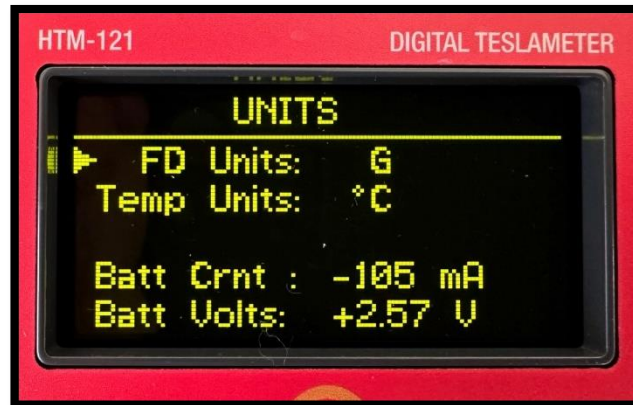
1	Temperature Indicator	Shows the temperature reading of the area measured
2	ABS/REL indicator	Absolute value or the Relative mode: Sampled & Stored
3	Battery Life Indicator	Visual and numerical display that shows device battery supply and status (up>charging, down> discharging).
4	Magnetic Field Reading	Shows the measured magnetic field
5	DC/RMS	AC/DC Mode
6	Minimum and Maximum Field	Shows the minimum and maximum field measured



### MAIN MENU

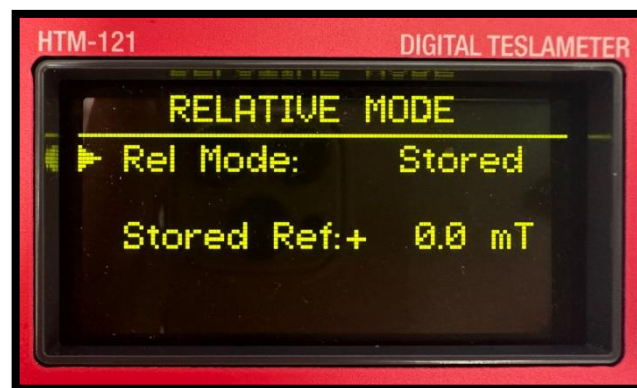
1	Units	Showing the Field and Temperature units, Battery Current and Battery Voltage.
2	Relative Mode	Indicates the Relative Mode and Stored Reference.
3	Serial Comms	Showing the HTM-121 Serial default settings that matches the LabView Interface default settings.

## HTM-121 Handheld Digital Teslameter Features



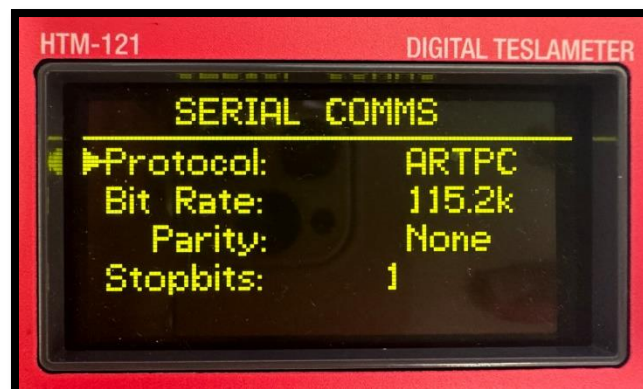
### UNITS

- |   |            |  |
|---|------------|--|
| 1 | FD Units   | Field unit selection: <b>Gauss(G)</b> and <b>Tesla(T)</b>                        |
| 2 | Temp Units | <b>Temperature</b> reading in either <b>Celsius °C</b> or <b>Fahrenheit °F</b> . |
| 3 | Batt Crnt  | Shows the actual <b>battery current discharge (charging if positive)</b>         |
| 4 | Batt Volts | Shows <b>battery voltages</b>  |



### RELATIVE MODE

- |   |                  |  |
|---|------------------|--|
| 1 | Rel Mode         | Shows selection: <b>Stored</b> and <b>Sampled</b> mode |
| 2 | Stored Reference | Showing stored field reading                           |



### SERIAL COMMS

Showing the HTM-121 Serial default settings that matches the LabView Interface default settings.

## HTM-121 Handheld Digital Teslameter Features

### CONNECTIVITY:



### PROBE PORT CONNECTION

To ensure accurate and reliable measurements, it is essential that the probe port connections on both Handheld Teslameter and Handheld Probe are properly aligned. Both units have a red dot at their respective probe ports. These marks are designed to align precisely when the probe is connected to the teslameter.



### USB PORT CONNECTIVITY

- Handheld Teslameter has a built-in USB port enables efficient communication with computers/laptops, facilitating quick data transfer and integration with the LabView Interface for enhanced data management.
- Battery charges when USB cable (supplied) is connected to a USB port of PC or a 5V USB external charger.

### HTM-121 LabVIEW VI Installation

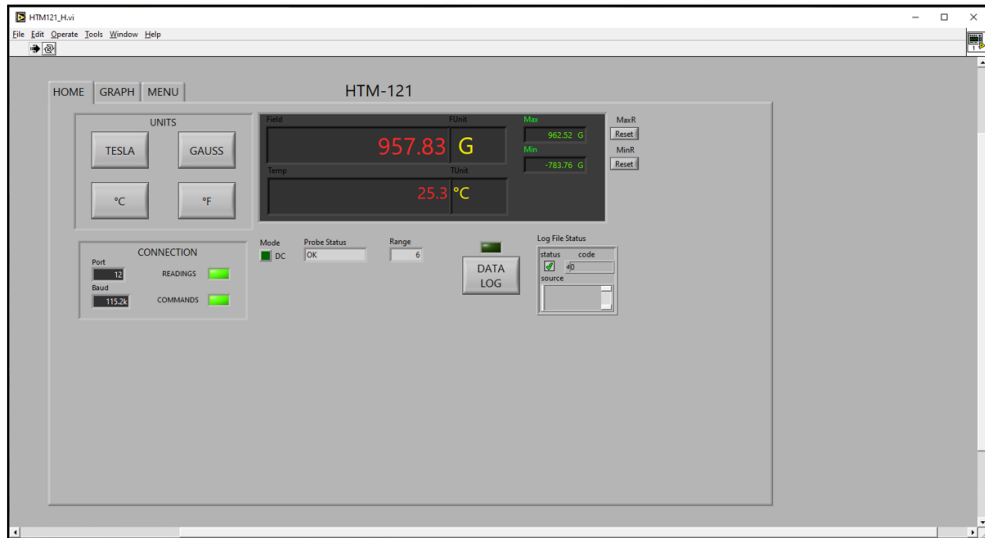
- See installation procedure text file on the downloadable installer files for details on the Group3 website.



## HTM-121 USING LABVIEW VI

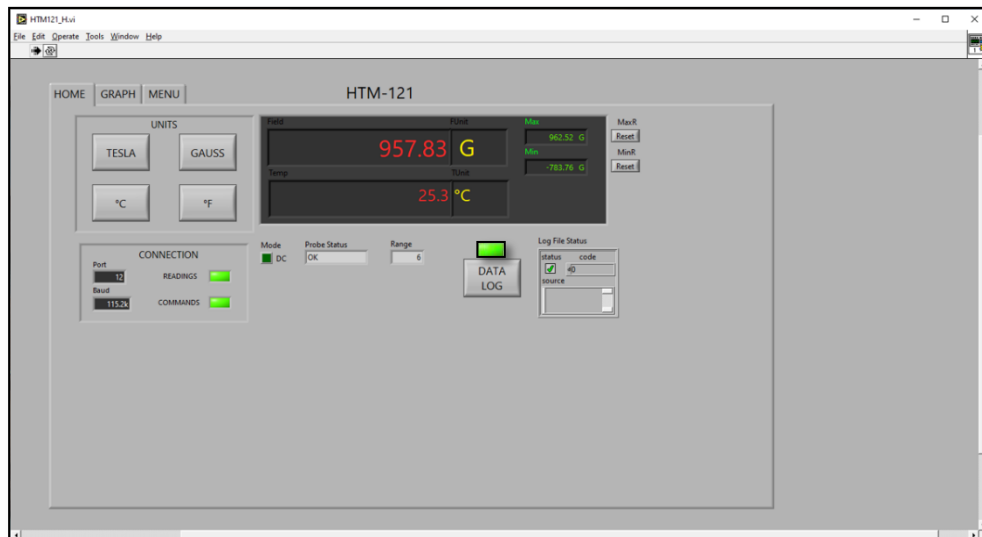
### A. START OPERATING LABVIEW VI:

- Attached/connect the HTM-121 in the computer/laptop using the connector provided and open LABVIEW software.
- Open LabView VI application for HTM121.
- Selecting SERIAL PORT by clicking **INCREMENT +1**, then click **OK** to use the appropriate port.



### B. HOME Display:

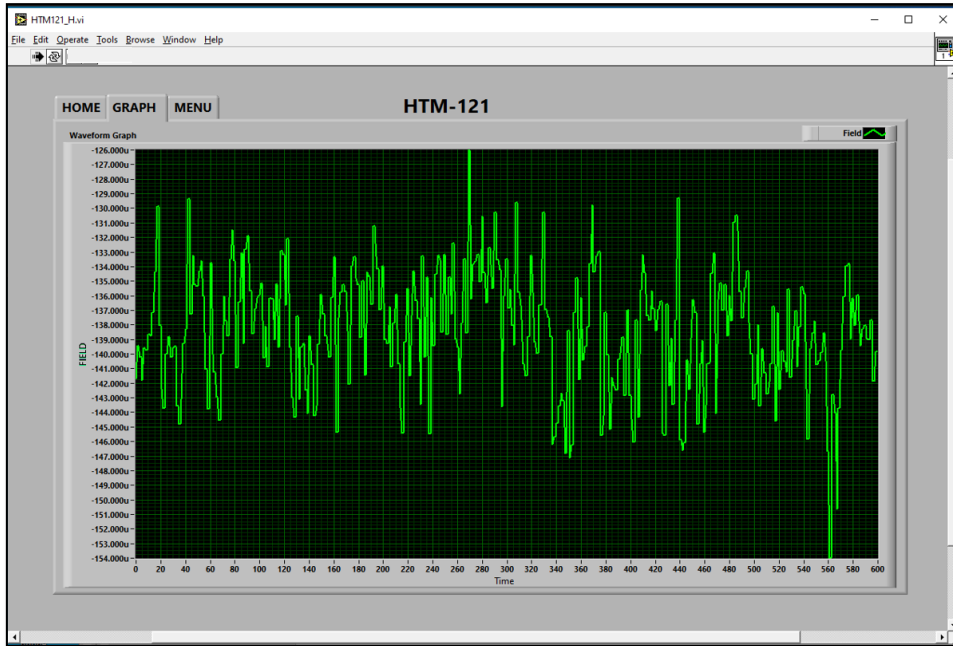
- **Field** Unit reading in either **GAUSS** or **TESLA** indicated on the LabView screen.
- Temperature reading in either **Celsius °C** or **Fahrenheit °F**.
- Indicating minimum and maximum reading, and it can reset by clicking **RESET** tab.
- **CONNECTION** shows the used PORT and BAUD settings. **READINGS** and **COMMANDS** indicator lights up GREEN when HTM-121 is communicating to LabView interface.
- **MODE**, indication of **AC/DC** voltage output.
- **PROBE STATUS**, indication if there is a probe connected the status is **OK**, if no probe connected the status is **MISSING**.
- **RANGE** shows the logged serial port number.
- HTM-121 has the capability to **DATA LOG** a field measurement session. The indicator lights up GREEN and it will start data collecting and saving files in Text format on Notepad.
  - Data Log files save in **Local Disk(C:)>G3T>HTM121>Logs**



## HTM-121 USING LABVIEW VI

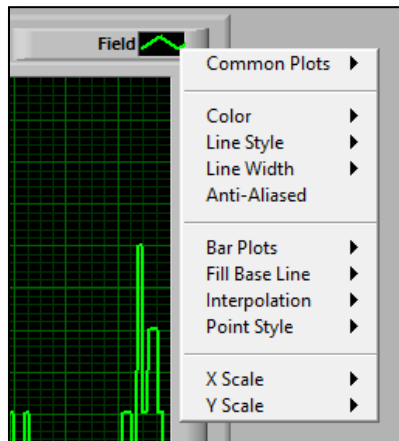
### C. REAL-TIME GRAPHICAL Display:

Featuring a dynamic graphical representation of magnetic field readings, the LabView provides users with a clear and immediate visualization of the data, enhancing the accuracy of measurements and decision-making processes.



- **FIELD TAB**

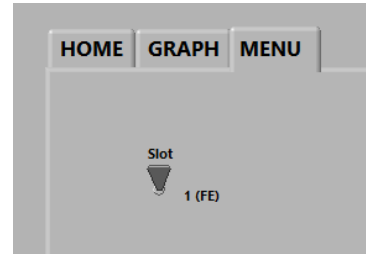
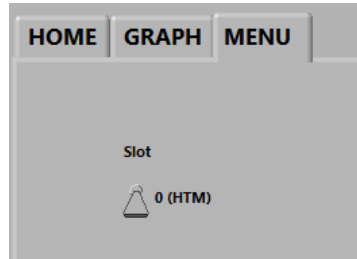
Enhances the user's ability to analyse and interpret magnetic field data by providing a customizable and intuitive graphical representation. By leveraging these settings, users can tailor the field graph to meet their specific need and gain deeper insights from their measurements.



## HTM-121 USING LABVIEW VI

### D. MENU Display:

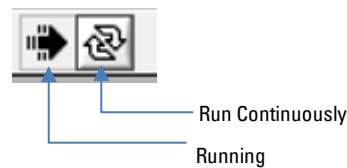
- Changing **SLOT** by clicking the toggle button.
  - **HTM** showing the actual field reading and time in LabView while connected on HTM-121 that is still running.
  - **FE** stops the actual field reading and time in LabView while connected on HTM-121 that is still running.



### E. UNIT RESET

Can be done by pressing the Up and Down arrow keys, then press ENTER.  
And Power ON again the HTM-121.

### F. RUNNING AND RUN CONTINUOUSLY



HTM-121 LabView VI able to:

- **Running** arrow indicator is the standard mode execution in LabView. When you click LabView, this is the sign that LabView is running properly.
- **Run Continuously**, this mode initiates uninterrupted data collection or measurement.

Each mode provides distinct functionalities to manage data collection and measurement effectively, allowing the users to control and adjust their processes based on operational needs.

## MAINTENANCE AND CARE FOR HANDHELD TESLAMETER

Proper maintenance and care are essential to ensure the longevity and optimal performance of your Group3 Handheld Teslameter (HTM-121). To maintain measurement accuracy, schedule regular calibrations according to Group3's recommendations for recalibration. Calibration should be performed using the appropriate calibrator designed for the handheld teslameter.

### Batteries, USB Port and Probe Port Management

The handheld teslameter is equipped with rechargeable batteries. Regularly monitor the battery level and recharge it as needed using the USB port. To preserve battery life, avoid completely draining the battery before recharging. If the rechargeable batteries, the USB port and the probe port are damaged, do not attempt to repair it yourself. Instead, return the device to the manufacturer for professional repair.

### Handling Precautions

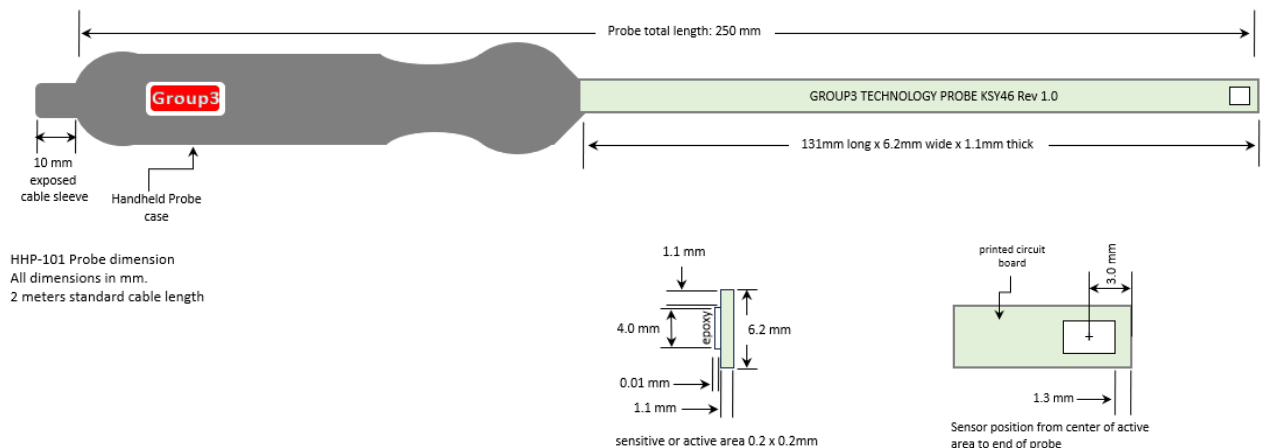
Handle the teslameter with care. Avoid dropping it or subjecting it to strong impacts, as this could impair its functionality and accuracy. If the teslameter experiences a significant impact, it may require factory recalibration and inspection from the Group3 manufacturer.

Do not attempt to open or repair the teslameter independently, as this could void the warranty and compromise its performance. By following these maintenance and care guidelines, you can ensure that your Group3 Handheld Teslameter and Handheld Probe remains reliable, accurate, and ready for use whenever you need it

## TROUBLESHOOTING

- **Display shows PROBE MISSING** – when no HHP-101 Hall probe is connected to the HTM.
- **Display shows PROBE OPEN CCT** – Turn off the HTM-121 by pressing the power button or press the Up and Down arrow keys and Enter key into the HTM-121 keypad to RESET the unit or to re-start the unit.
- **Display freezes or hangs up** – Turn off the HTM-121 by pressing the power button.
- **Display shows erroneous data** – If field readings shows abnormality or that readings is different or inconsistent compared to LabView Interface, press the Up and Down arrow keys and Enter key unto the HTM-121 keypad to RESET the unit or to re-start the unit.
- **ALL OTHER ERRORS** – if unit is still misbehaving or not operating correctly after doing a reset, kindly contact Group3 through our website [www.group3technology.com/service](http://www.group3technology.com/service) or email [service@group3technology.com](mailto:service@group3technology.com) for advice.

## HHP-101 HANDHELD HALL PROBE



## CONNECTING THE HALL PROBE

**Before handling the probe, please read the following:**

Group3 HHP-101 Hall probe are engineered to deliver a high degree of robustness, particularly for a device of its size and precision. However, it is most important that certain precautions be taken when handling and installing probes so that they are not damaged or destroyed, and to ensure the preservation of its calibration integrity.

### Precision and Reliability

The HHP-101 probe is calibrated to deliver precise and consistent measurements when paired with the Group3 Handheld Teslameter (HTM-121). Together, the HHP-101 and HTM-121 offer a  $\pm 1.0\%$  full-scale basic accuracy, ensuring that every measurement you take is highly accurate. This level of precision minimizes the margin for error, providing you with dependable data for your critical applications.

### Advanced Sensor and Components

At the core of the HHP-101 probe lies an advanced sensor, accompanied by meticulously engineered components. These are specifically chosen to enhance the probe's sensitivity and accuracy. The sensor is designed to detect even the smallest variations in magnetic fields and temperature readings, making the HHP-101 probe ideal for applications where precision is paramount.

### Cable Integrity and Handling

The standard probe cable length is 2 meters. The design of the handheld probe ensures that the cable remains free from pinching or other forms of mechanical stress that could compromise its functionality. Proper handling is crucial to maintaining the probe's integrity and performance. Any severe damage to the cable and probe itself will necessitate factory-level repair, replacement, and recalibration.

### Compatibility and Usage

The HHP-101 probe is specifically designed to be used with the Group3 Handheld Teslameter HTM-121. Whether the probe is supplied with your teslameter, or it can be obtained separately. Each unit of the handheld probe and teslameter are calibrated to ensure accurate and reliable measurements.

### Maintenance and Care

To ensure the longevity and optimal performance of HHP-101 probe, it is essential to handle it with care. Avoid excessive bending or twisting of the cable and protect the probe from harsh environments that could cause damage. In the event of significant damage, do not attempt to open or repair the probe independently, as this could void the warranty and compromise its performance; instead, return it to manufacturer for professional repair and recalibration. To maintain measurement accuracy, schedule regular calibrations according to Group3 manufacturer's recommendations.

## LIMITED WARRANTY

Group3 Technology Ltd. (hereinafter called the Company) warrants instruments and other products of its manufacture to be free from defects in materials and workmanship that adversely affect the product's normal functioning under normal use and service for a period of one year from the date of shipment to the purchaser.

The obligation of this warranty shall be limited to repairing or replacing, at the discretion of the Company and without charge, any equipment which the Company agrees is defective as set out above within its warranty period. The Company will reimburse lowest freight rate two-way charges on any item returned to the Company's factory or any authorised distributor or service centre, provided that prior written authorisation for such return has been given by the Company.

This warranty shall not apply to any equipment which the Company determines to have become defective owing to mishandling, improper installation, alteration, negligence, inadequate maintenance, incorrect use, exposure to environmental conditions exceeding specifications, or any other circumstance not generally acceptable for equipment of a similar type.

The Company reserves the right to make changes in design without incurring any obligation to modify previously manufactured units. No other warranties are expressed or implied, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. The Company is not liable for consequential damages.

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**Changes to v1.0 040924**

- Initial issue.



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