Megger

BITE5 Advanced

Battery tester

User Guide

EN
English

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For Patent information about this instrument refer to the following web site:
megger.com/patents

This manual supersedes all previous issues of this manual. Please ensure that you are using the most recent issue of this document. Destroy any copies that are of an older issue.

Declaration of Conformity

Hereby, Megger Instruments Limited declares that radio equipment manufactured by Megger Instruments Limited described in this user guide is in compliance with Directive 2014/53/EU. Other equipment manufactured by Megger Instruments Limited described in this user guide is in compliance with Directives 2014/30/EU and 2014/35/EU where they apply.

The full text of Megger Instruments EU declarations of conformity are available at the following internet address:

megger.com/eu-dofc

Contents

1. Introduction

This document is the user guide for the Megger BITE5 ADVANCED Battery Tester. It provides a description of the operation of the unit as well as operating instructions. Read this manual before installing or using the equipment. Special emphasis should be placed on all safety discussions.

1.1 Product description

The Megger BITE5 ADVANCED Battery Tester has been designed with emphasis on reliability, simplicity, and ease of use. It will provide you with the information you need to reliably test batteries.

1.2 Included with the BITE5

- BITE5 ADVANCED battery tester
- Duplex probes
- Voltage leads
- Charger
- microSD card
- microSD card reader
- Mini USB cable
- Neck strap
- Zero bar
- Stylus

1.3 Applications

- Battery testing

1.4 Company web site

Occasionally an information bulletin may be issued via the Megger web site. This may concern new accessories, new usage instructions or a software update. Please occasionally check on the Megger web site for anything applicable to your Megger instruments.

2. Safety Warnings and Standards

WARNING : Death, serious injury, or fire hazard could result from improper use/installation of this instrument. Read and understand this user guide before installing this instrument.

Installation of this instrument MUST be performed in compliance with the National Electric Code and any additional safety requirements applicable to your installation.

Installation, operation, and maintenance of this instrument MUST be performed by qualified personnel only.
The National Electrical Code defines a qualified person as one familiar with the construction and operation of the equipment and the hazards involved.

2.1 Warnings, Cautions and Notes

This user guide follows the internationally recognised definition. These instructions must be adhered to at all times.

Description
DANGER : Indicates a dangerous situation which, if ignored, could lead to death, serious injury or health problems.
WARNING : Indicates a potentially dangerous situation which, if ignored, could lead to death, serious injury or health problems.
ATTENTION : Indicates a dangerous situation which, if ignored, could lead to injuries or health problems.
CAUTION : Indicates a situation which could lead to damage of the equipment or environment
NOTE : Indicates important instructions to be followed to perform the relevant process safely and efficiently.

Icon	Description
	**EN ISO 7010 P007** Interference to the operation of or damage to active implanted cardiac devices from this equipment which generates strong electromagnetic fields. No access for people with active implanted cardiac devices.
	**EN ISO 7010 W006** Warning of the presence of strong magnetic field.
	**EN ISO 7010 W001** Warning to consult the user instructions. Caution is necessary when operating the device or control close to where this symbol is placed, or to indicate that an operation needs operator awareness and protective action in order to avoid hazardous situations.
	**HIGH VOLTAGE,** Risk of electric shock
	**Earth/Ground**

2.2 Safety warnings

The following safety precautions MUST be taken whenever the instrument is installed:

- Wear safety glasses and insulated gloves when making connections to power circuits
- Hands, shoes, floor/ground must be dry when making any connection to a powered line

2.3 Installation category definitions:

CAT IV - Measurement category IV: Equipment connected between the origin of the low-voltage mains supply and distribution panel.

CAT III -Measurement category III: Equipment connected between the distribution panel and electrical outlets.

CAT II - Measurement category II: Equipment connected between the electrical outlets and user's equipment.

Measurement equipment may be safely connected to circuits at the marked rating or lower. The connection rating is that of the lowest rated component in the measurement circuit.

2.4 Safety, Hazard and Warning symbols on the instrument

This paragraph details the various safety and hazard icons on the instrument's outer case.

Icon	Description
	Warning: High Voltage, risk of electric shock
	Caution: Refer to user guide.
	UK conformity. This equipment complies with current UK legislation
	EU conformity. Equipment complies with current EU directives.
	Conforms to relevant Australian Safety and EMC standards
	Do not dispose of to landfill, in sewage systems or by fire.
	Equipment protected throughout by double insulation.
	Reference earth connection. Not a protective earth terminal

3. Instrument Overview

3.1 Instrument layout

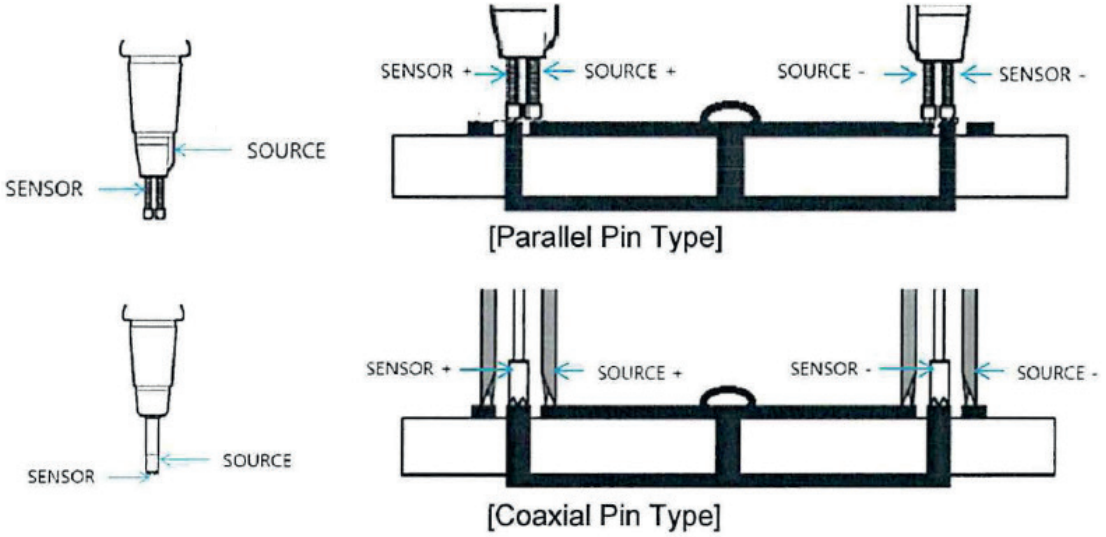
One or more relavent viewpoints of the instrument with numbered arrows to reference the table below

Item	Description	Item	Description
1	Voltage lead input -	8	Lock and unlock screen
2	Current probe input	9	Ohmic testing
3	Mini USB input and micro SD card slot	10	VA testing
4	DC power adapter input	11	Data and string records
5	ON/OFF switch	12	Recorded data charts
6	Impedance probe inputs	13	Instrument configuration
7	Voltage lead input +		

4. Zero adjustment

For accurate ohmic measurements, it is recommended that a zero adjust is performed when changing probes. To perform a zero adjust, use the included zero bar.

When performing a zero adjustment, place the source pin on the outer copper surface of the zero bar and place the sensor pin in one of the holes of the zero adjust bar.

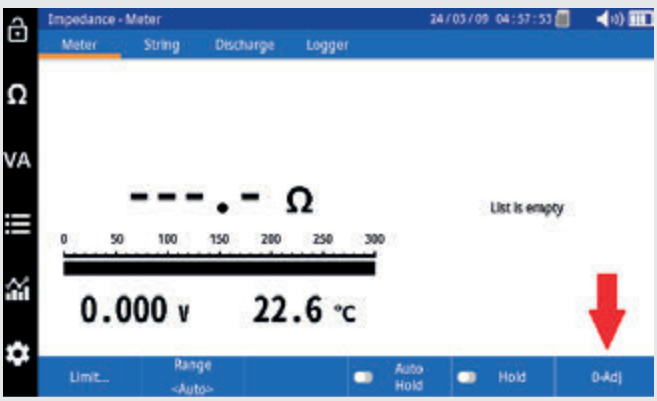


4.1 Zero adjustment procedure

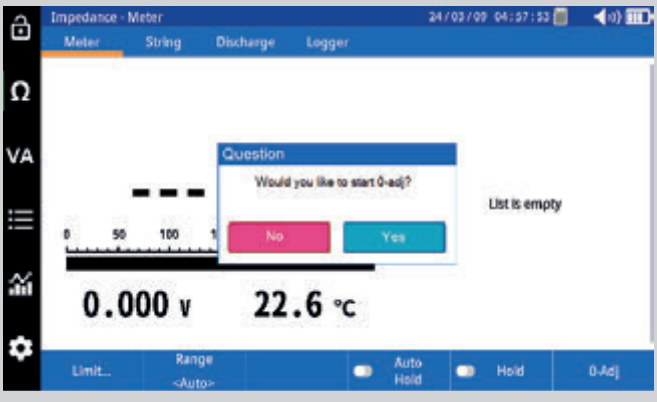
Select “0-ADJ”.

The BITE5 ADVANCED will prompt you to make a zero adjustment bar. Select YES.

NOTE: Place the probes on the zero adjustment bar as shown within 10 seconds of selecting YES, or the BITE5 ADVANCED will time out.



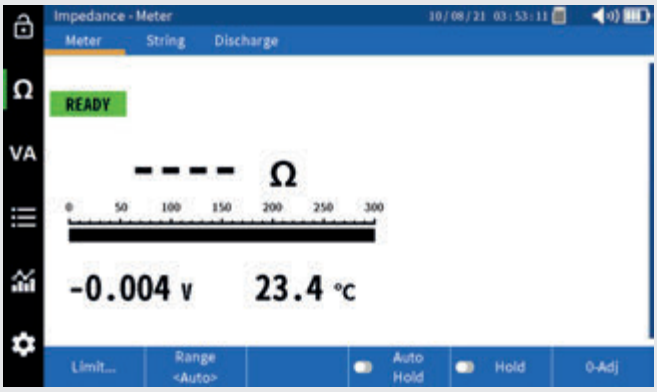
This zero adjustment will begin. Hold probes on zero bar until adjustment is complete.



5. Configuration of BITE5 ADVANCED

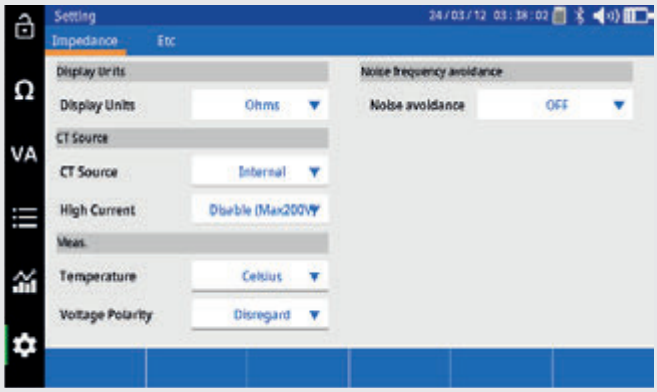
The BITE5 ADVANCED allows you to customize the unit for your needs.

To configure the unit, select the CONFIGURATION ICON.



IMPEDANCE TAB

Display Units	Set measured ohmic values to ohms or siemens.
CT Source	Set to internal for series strings or parallel for parallel strings.
High Current	Set tets current to 700mA or 100mA.
Temperature	Set temperature units to either Celsius or Fahrenheit.
Voltage Polarity	Set unit to record or disregard voltage polarity.
Noise Avoidance	Alter the test frequency to reduce effect of noisy stings.



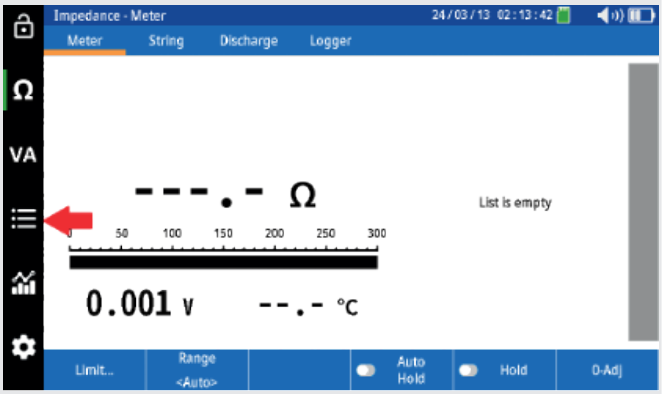
ETC TAB

Language	Select desired language.
Date Format	Select desired date format.
Brightness	Adjust the brightness of the display.
Display Off	Set automatic display turn off time.
Time	Set the date and time.
Buzzer	Set the buzzer volume.
Auto P Off	Set automatic power down time.
SD Card	Format SD Card
Reset Settings	Reset BITE5.

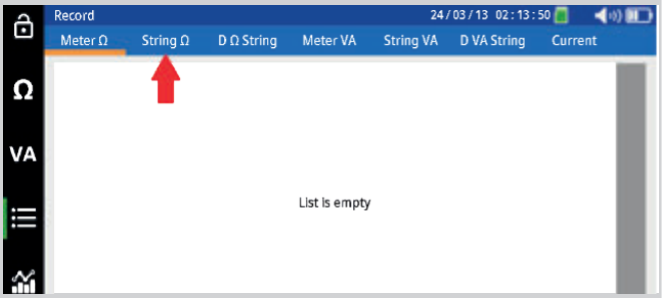
6. Configuration of string

The BITE5 ADVANCED allows you to configure strings to be tested.

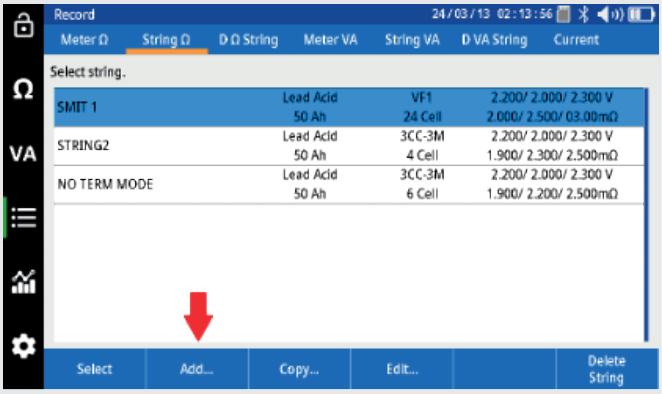
To configure a new battery string press the RECORD ICON.



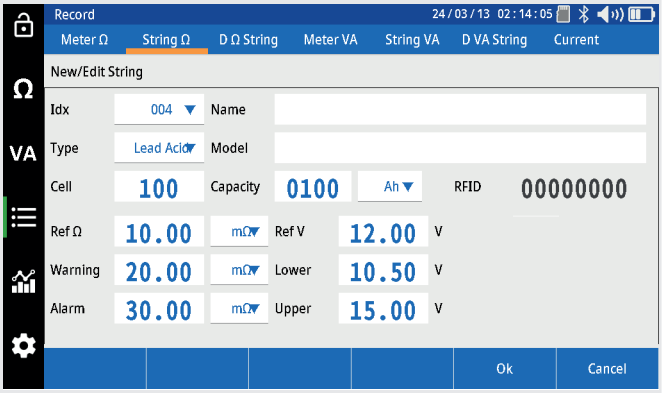
Select "String Ω".



Select "Add…"



This will open the String Configuration screen.



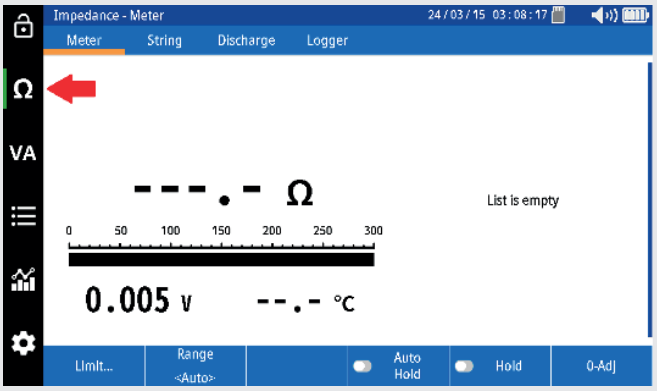
Idx	Sets a file index number (Set automatically).
Type	Select battery chemistry
Cell	Number of Cells to test
Name	Name of string
Model	Model number of batteries
Capacity	Battery capacity in Ah or mAh
Ref Ω	Baseline reference value
Warning	Warning upper ohmic limit
Alarm	Alarm upper ohmic limit
Ref V	Cell float voltage
Lower	Low voltage limit
Upper	Upper voltage limit
RFID	Scanned RFID tag number

7. Performing a quick test (Meter Mode)

In the meter mode the BITE5 will take ohmic measurements but will not save the recordings to a programmed string configuration.

Select the Ohm (Ω) ICON.

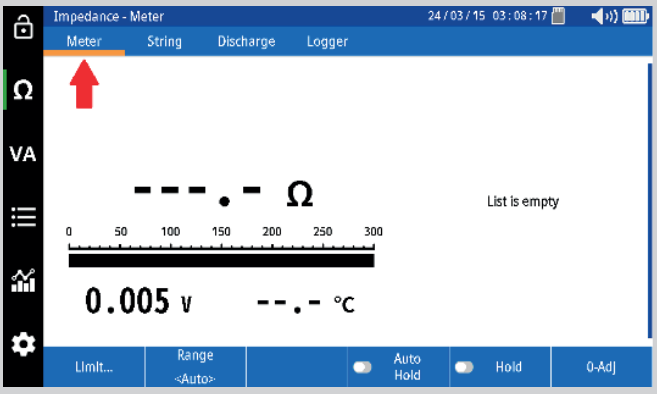
When the Ohm (Ω) ICON is selected it configures the unit to record ohmic values, voltage, and temperature.



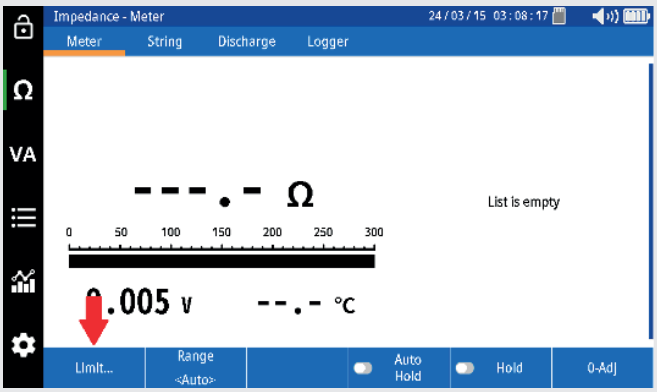
When the Ohm (Ω) ICON is selected the BITE5 Advanced will use the Duplex inputs.

Connect the duplex probes to the BITE5 ADVANCED.

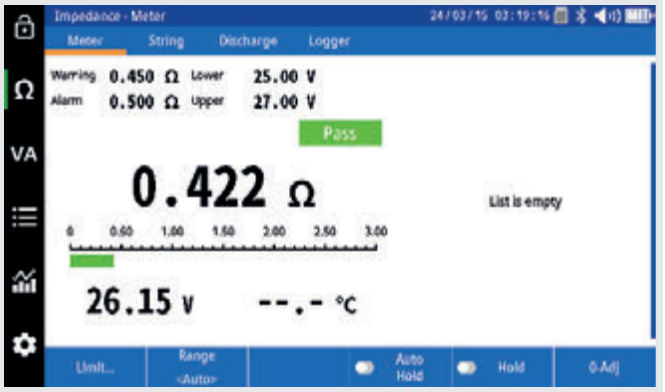
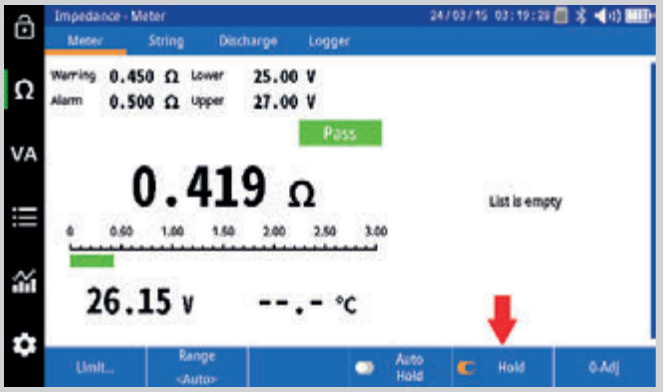
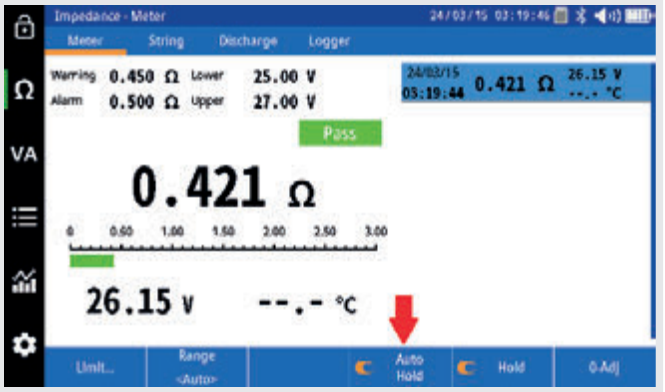
Select "Meter



Select "Limit" if you would like to program impedance and voltage limits for the measurement.

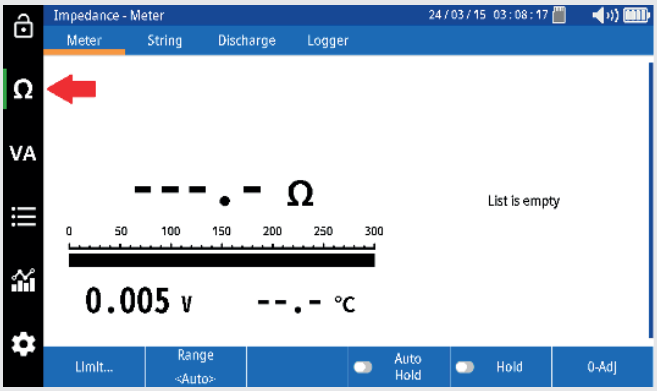
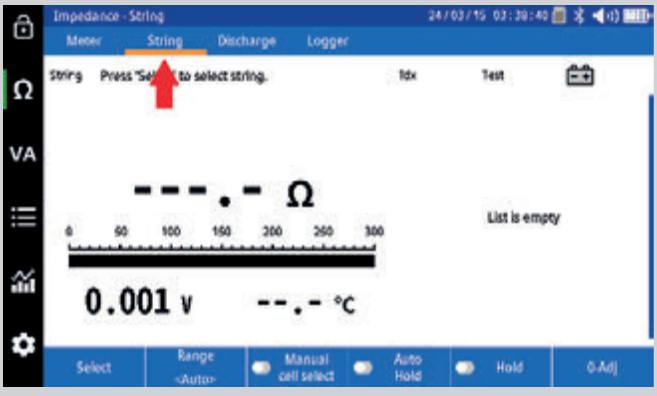
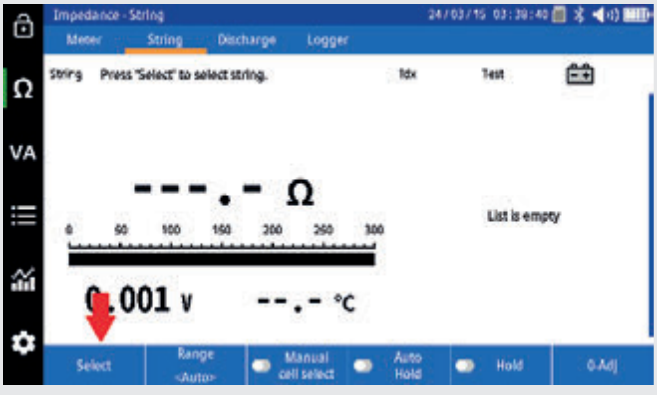


Performing a quick test (Meter Mode)

This screen will allow you to program a warning and alarm limit for the impedance value and a lower limit for the voltage. This is an optional step. Select OK when done. Note: This feature can be disabled as well by selecting OFF.	
Start testing by placing the probes across the battery. The BITE5 ADVANCED will beep when the measurement is complete.	
Press "Hold" to freeze the value on the screen.	
Select "Auto Hold" and the BITE5 ADVANCED will automatically save any measurement with a date and time stamp.	

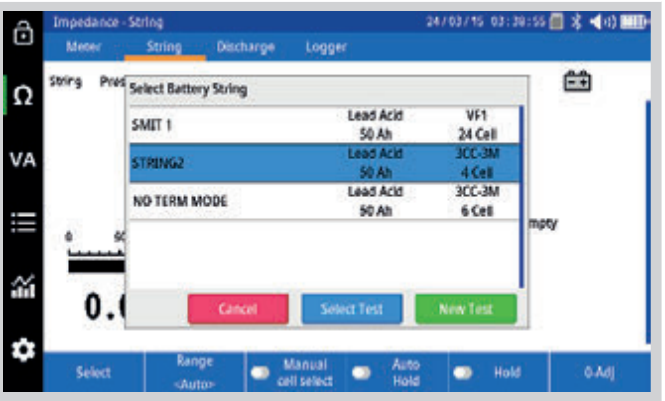
8. Performing an impedance test on a battery string.

In this mode the BITE5 will take impedance measurements and will save the record values to a programmed string configuration.

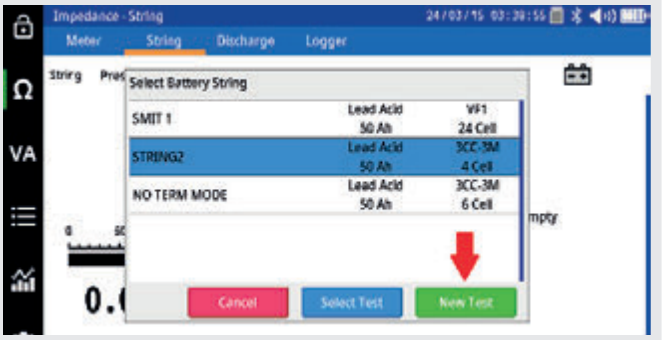
Select the Ohm (Ω) ICON. When the Ohm (Ω) ICON is selected it configures the unit to record ohmic values, voltage and temperature	
When the Ohm (Ω) ICON is selected the BITE5 Advanced will use the Duplex inputs.	
Connect the duplex probes to the BITE5 ADVANCED.	
Select “String”	
Select “Select”.	

Performing an impedance test on a battery string.

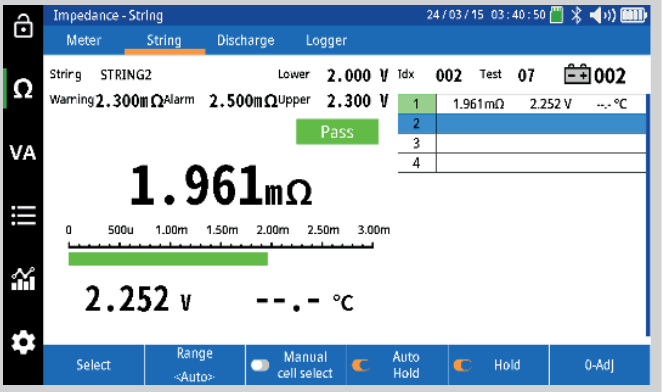
Select desired string or scan the RFID tag, if used.



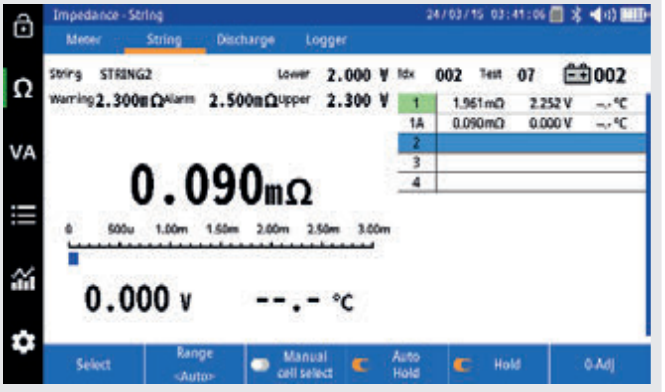
Select "New Test" to start a new test on the selected string.



Start testing by placing the probes on the first cell. The unit will beep when the measurement is complete and save the measured values to memory. The results will be displayed on the screen.



Move to the next battery or strap. The BITE5 ADVANCED will automatically identify if it is on a cell or a strap and take the measurement. The recorded values will be displayed on the screen.



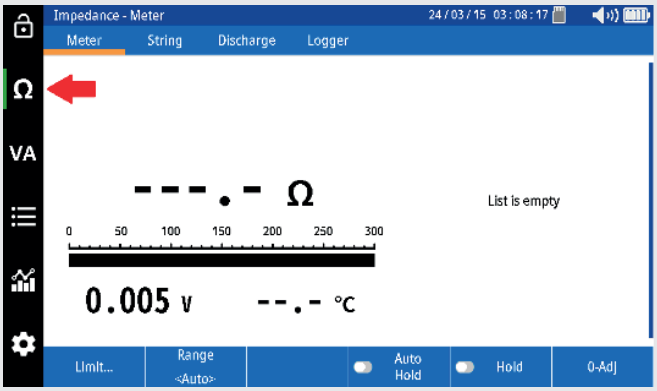
Continue taking measurement of each cell and strap in sequence until you reach the last cell in the string. When the BITE5 ADVANCED measures the last cell in the string, it will display a summary.

9. Performing a NERC terminal mode impedance test on a battery string.

This is a NERC compliance test. In this mode the BITE5 will take the terminal impedance measurements in addition to the cell and strap impedance measurements. All values will be saved to the selected string configuration.

Select the Ohm (Ω) ICON.

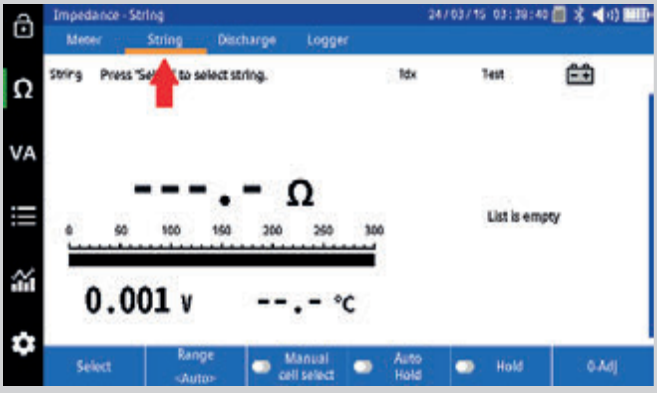
When the Ohm (Ω) ICON is selected it configures the unit to record ohmic values, voltage and temperature.



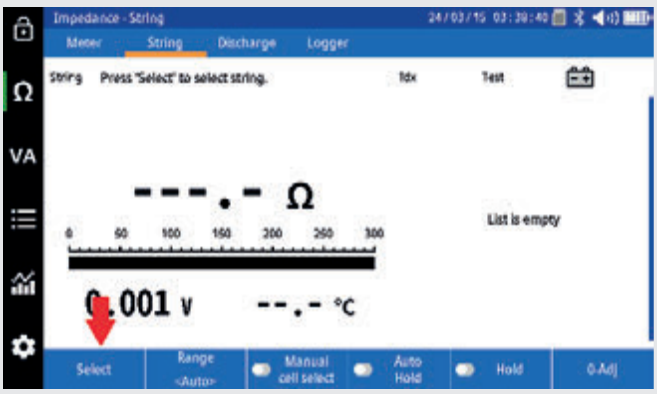
When the Ohm (Ω) ICON is selected the BITE5 Advanced will use the Duplex inputs.

Connect the duplex probes to the BITE5 ADVANCED.

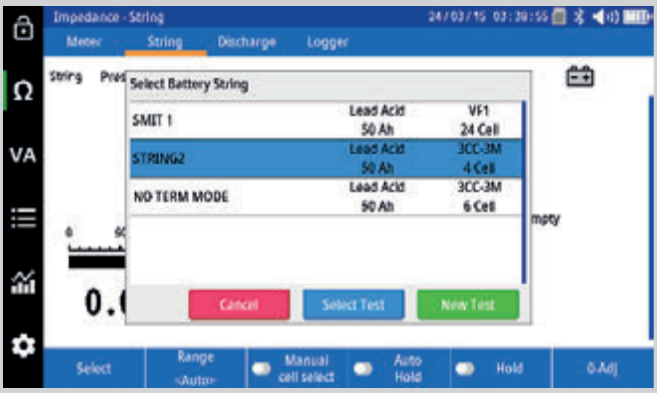
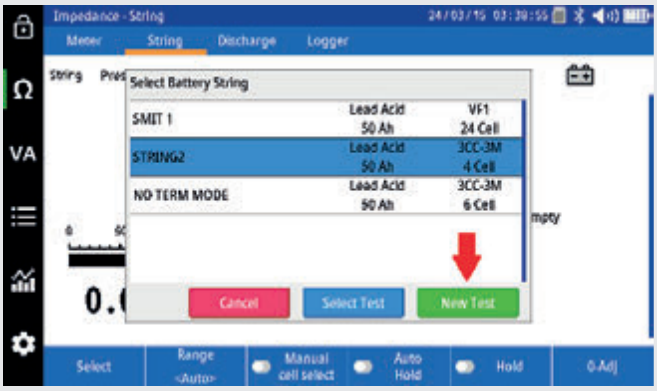
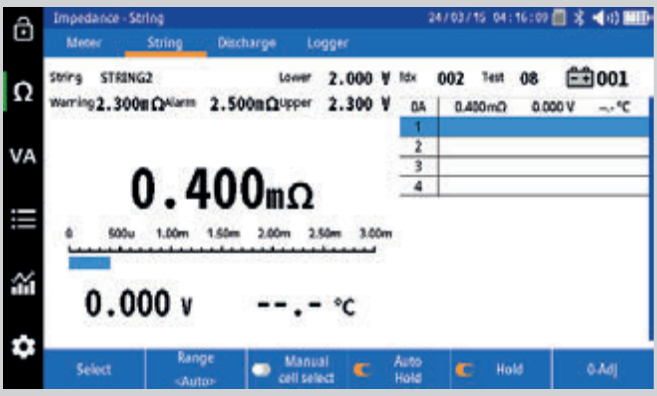
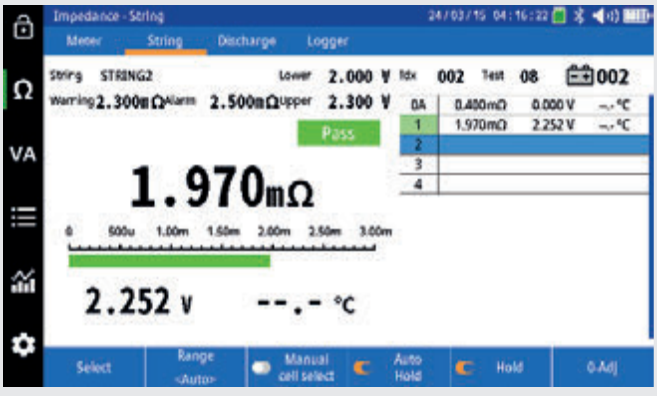
Select “String”



Select “Select”.



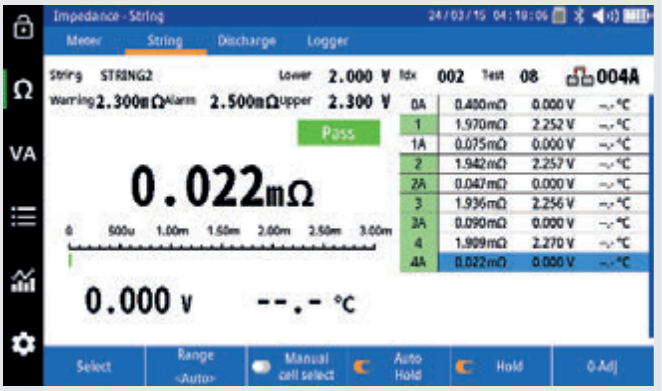
Performing a NERC terminal mode impedance test on a battery string.

Select desired string. or scan the RFID tag, if used.	
Select "New Test" to start a new test on the selected string.	
Start testing by placing the probes on positive terminal connection. This is the connection from the end of the charger leads to the first positive battery terminal. The BITE5 ADVANCED will automatically identify this as a strap. The value will be saved as strap 0A. The results will be displayed on the screen.	
Move to the next battery or strap. The BITE5 ADVANCED will automatically identify if it is on a cell or a strap and take the measurement. The recorded values will be displayed on the screen.	

Performing a NERC terminal mode impedance test on a battery string.

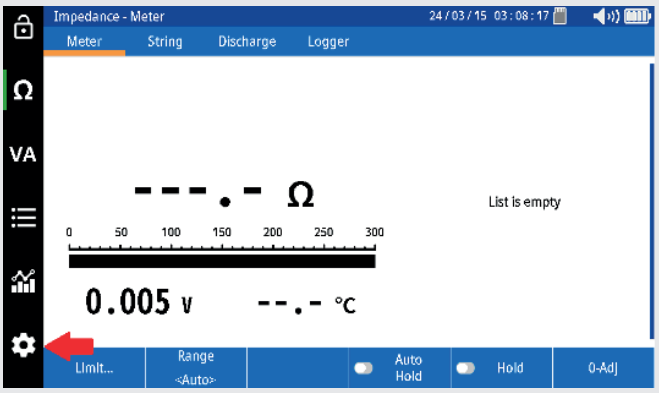
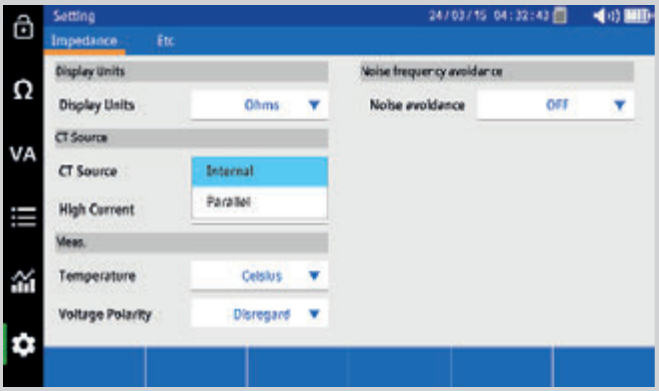
Continue taking measurement of each cell and strap in sequence until you reach the last cell in the string. When the BITE5 ADVANCED measures the last cell in the string, it will display a summary.

To record the negative terminal connection, close the summary and measure from the end of the negative charger lead to the last post on the last battery. This value will be saved as a strap.



10. Performing an impedance test on a parallel battery string.

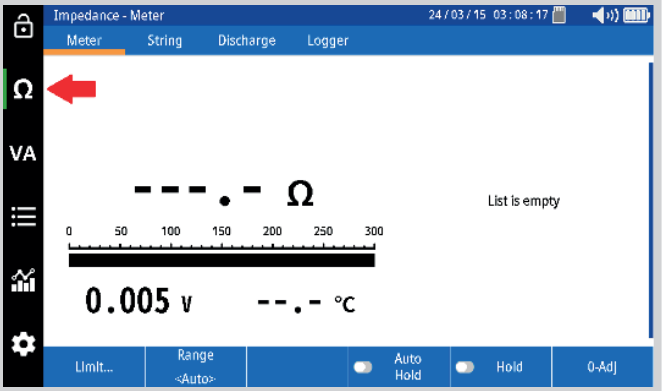
When performing a ohmic test on a parallel string some of the test current escapes through the parallel path. This leads to inaccuracies in the measurement. In this mode the BITE5 will take impedance measurements, while recording the escape current, through the parallel path. This will provide accurate measurements avoiding the need to segment the string. The recorded values will be saved to the selected string configuration.

Select the “Setting” ICON.	
Set the CT Source to “Parallel”	
Set the High Current to 700mA.	
Plug the AC CT into the BITE5 ADVANCED	

Place the AC Current clamps on the parallel path.

Select the Ohm (Ω) ICON.

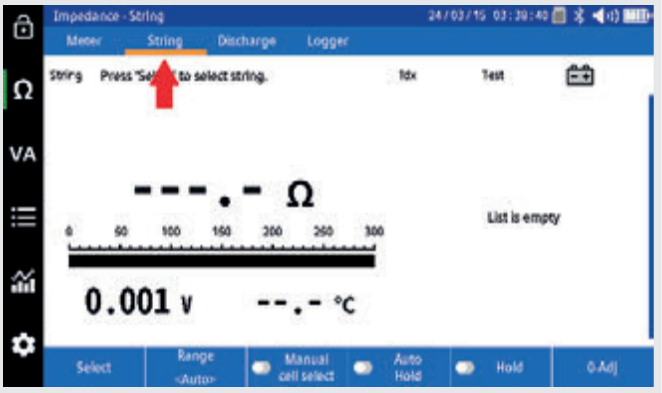
When the Ohm (Ω) ICON is selected it configures the unit to record ohmic values, voltage, and temperature.



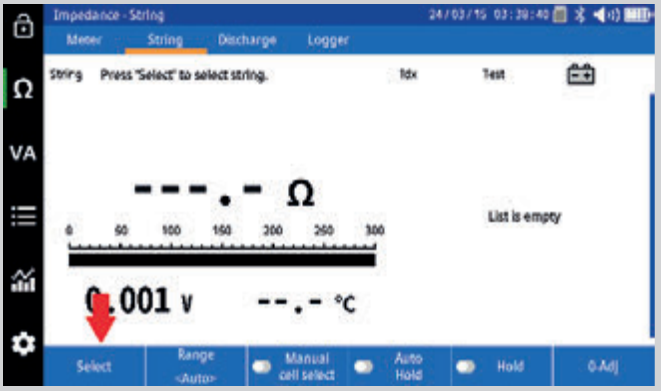
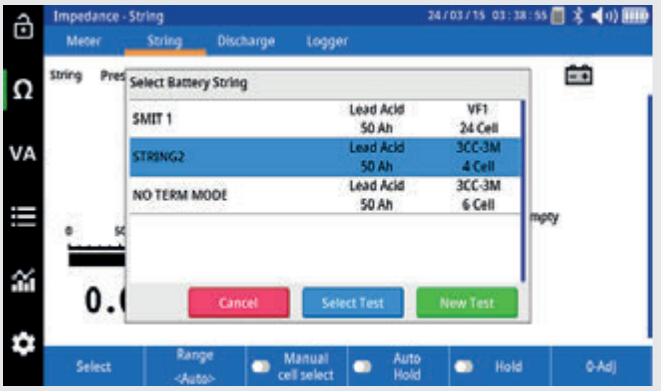
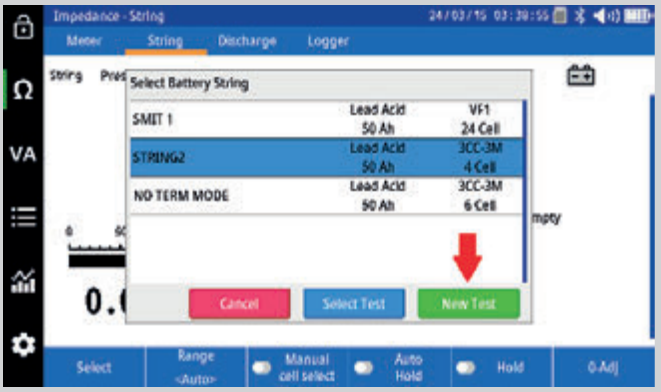
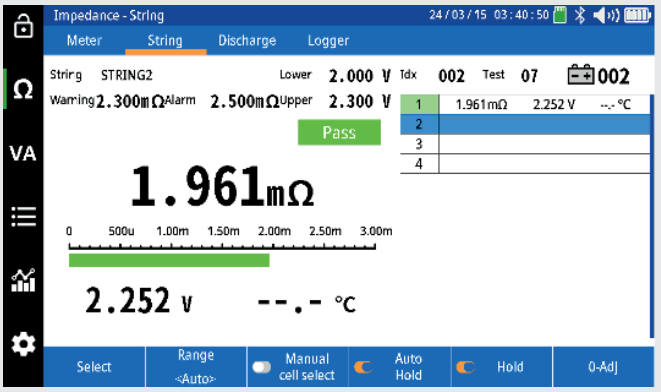
When the Ohm (Ω) ICON is selected the BITE5 Advanced will use the Duplex inputs.

Connect the duplex probes to the BITE5 ADVANCED. to voltage inputs of the BITE5 ADVANCED.

Select “String”

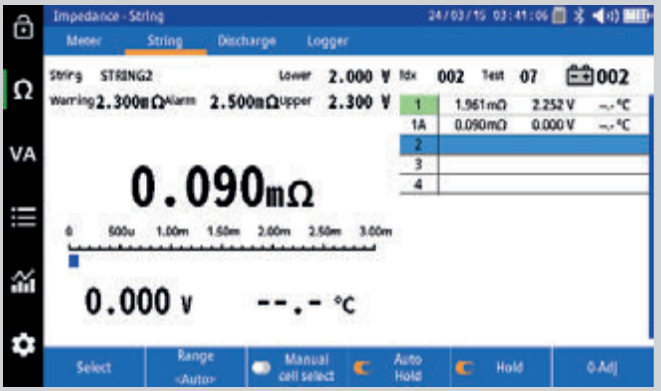


Performing an impedance test on a parallel battery string.

Select “Select”.	
Select desired string. or scan the RFID tag, if used.	
Select “New Test” to start a new test on the selected string.	
Start testing by placing the probes on the first cell. The unit will beep when the measurement is complete and save the measured values to memory. The results will be displayed on the screen.	

Move to the next battery or strap. The BITE5 ADVANCED will automatically identify if it is on a cell or a strap and take the measurement.

The recorded values will be displayed on the screen.



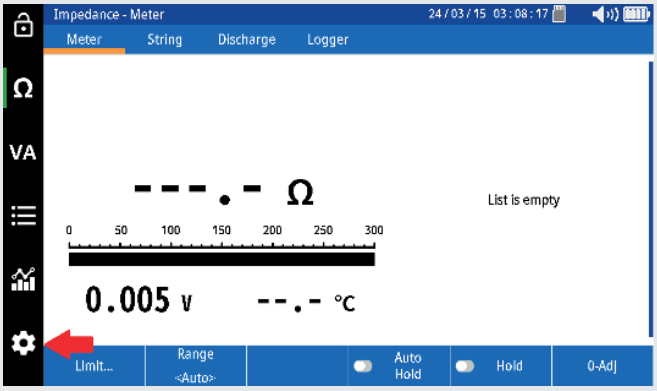
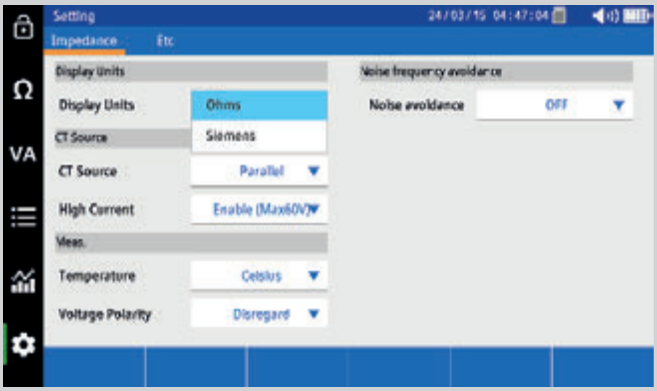
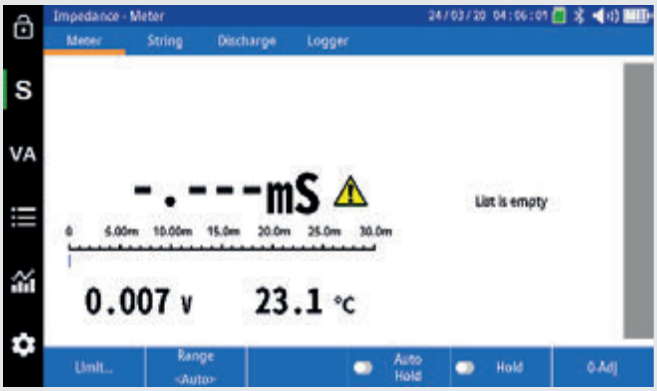
Continue taking measurements until the parallel string is reached. At this point move the AC CT to the path that was just measured and then continue measuring the cells and straps if the parallel string.

Continue taking measurements of each cell and strap in sequence until you reach the last cell in the string. When the BITE5 ADVANCED measures the last cell in the string, it will display a summary.

11. Performing a conductance test on a battery string.

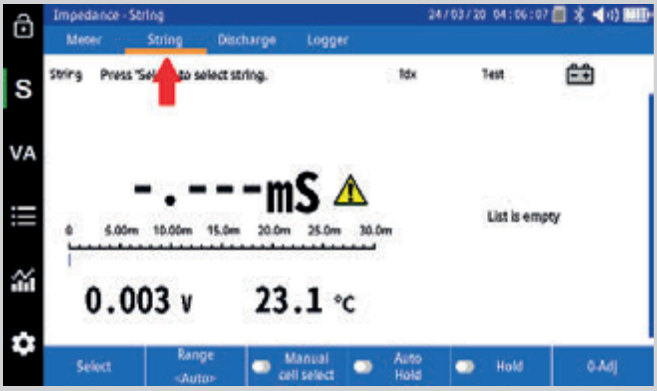
The BITE5 can record the measured data as either milliohms or in Siemens. This test will record the data in Siemens. All the data will be saved to the selected string.

NOTE: All limits in the selected string will need to be in Siemens.

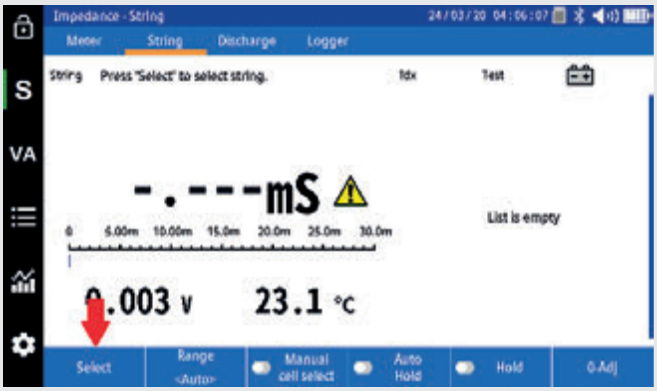
Select the “Setting” ICON.	
Set the Display units to “Siemens”	
Select the Siemens (S) ICON. When the Siemens (S) ICON is selected it configures the unit to record Siemens, voltage and temperature	
When the Siemens (S) ICON is selected the BITE5 Advanced will use the Duplex inputs.	

Connect the duplex probes to the BITE5 ADVANCED.
to voltage inputs of the BITE5 ADVANCED.

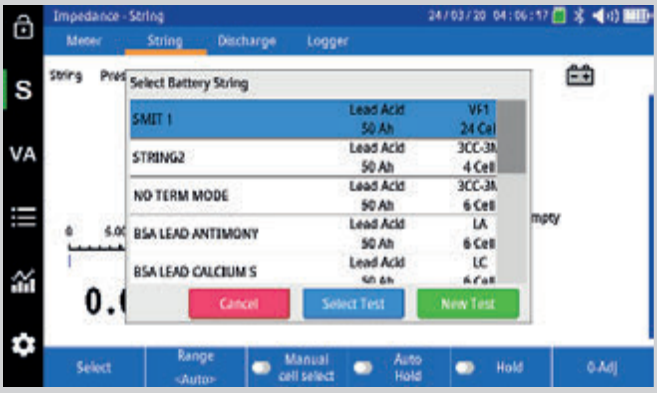
Select “String”



Select “Select”.

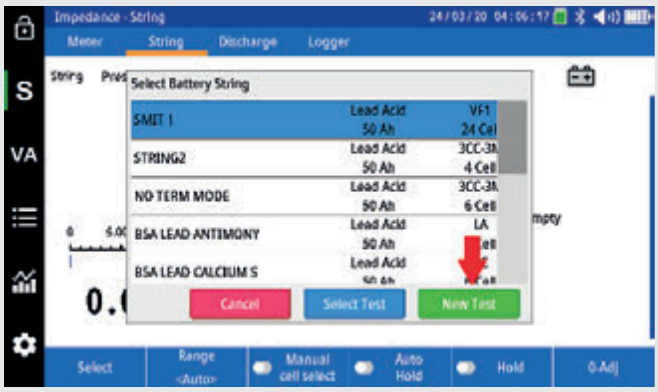


Select desired string. or scan the RFID tag, if used.



Performing a conductance test on a battery string.

Select “New Test” to start a new test on the selected string.



Start testing by placing the probes on the first cell. The unit will beep when the measurement is complete and save the measured values to memory. The results will be displayed on the screen.

Move to the next battery.

The recorded values will be displayed on the screen.

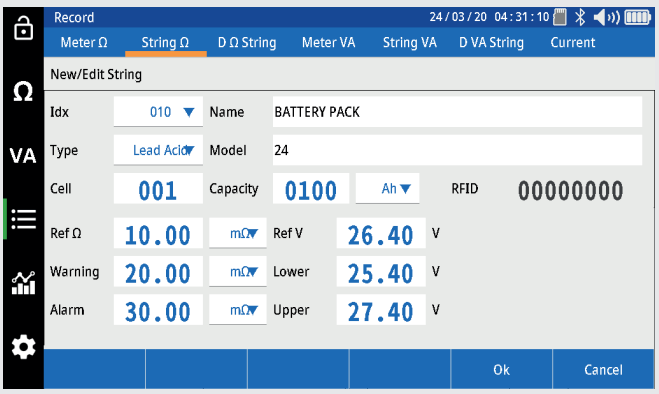
NOTE: The unit can be used to measure intercell connections is Siemens, however it is not recommended. Since Siemens is the reciprocal of resistance, the measured values of the straps will be very high. This may be seen as an OL.

Continue taking measurement of each cell and strap in sequence until you reach the last cell in the string. When the BITE5 ADVANCED measures the last cell in the string, it will display a summary.

12. Performing an impedance test on a battery pack.

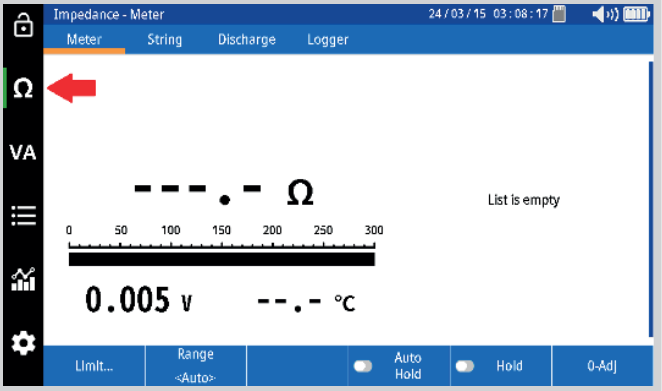
In this mode the BITE5 will take a single impedance measurement across a battery pack or across an entire battery string (UP to 500Vdc) This test is applicable to mobile battery packs, such as in forklifts. The batteries do need to be fully charged.

In the string configuration verify the number of cells is set to 1.



Select the Ohm (Ω) ICON.

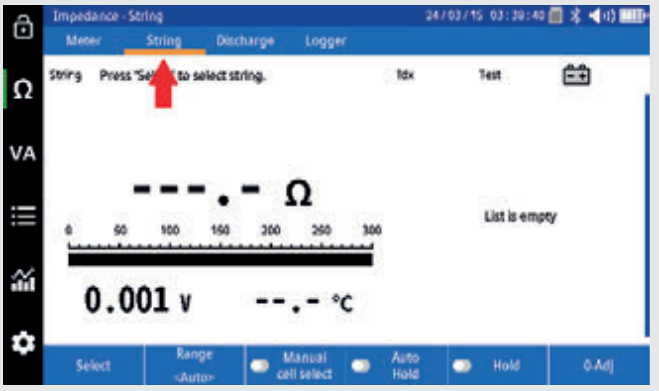
When the Ohm (Ω) ICON is selected it configures the unit to record ohmic values, voltage and temperature



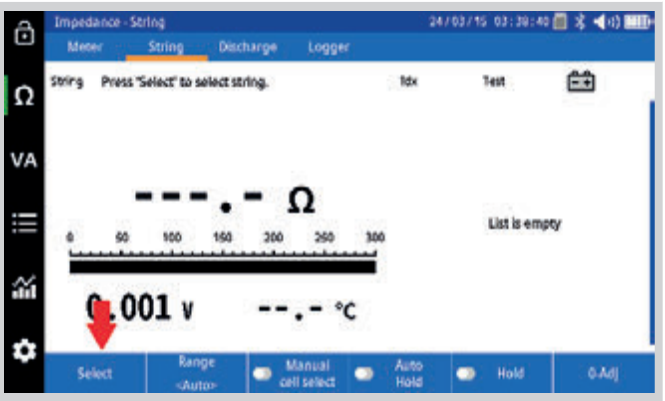
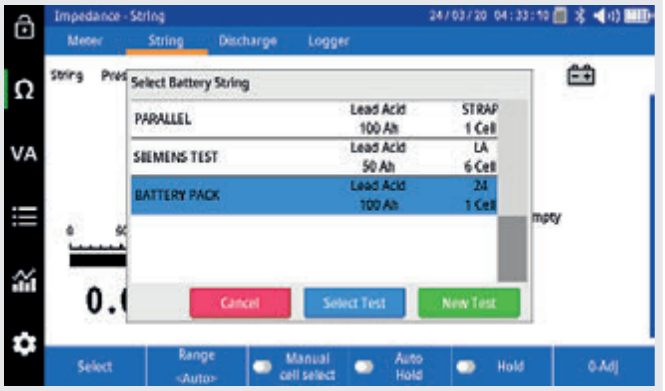
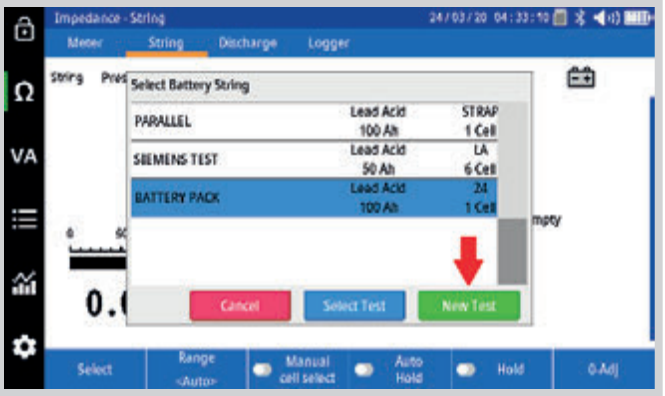
When the Ohm (Ω) ICON is selected the BITE5 Advanced will use the Duplex input.

Connect the Duplex Kelvin Clips to the BITE5. This measurement can be made with the Duplex probes, however the Kelvin Clips may be easier.

Select "String"



Performing an impedance test on a battery pack.

Select “Select”.	
Select desired battery pack / string. or scan the RFID tag, if used.	
Select “New Test” to start a new test on the selected string.	
Place the kelvin clips across the battery pack or the battery string. The BITE5 Advanced will automatically take the measurement and save it to memory.	

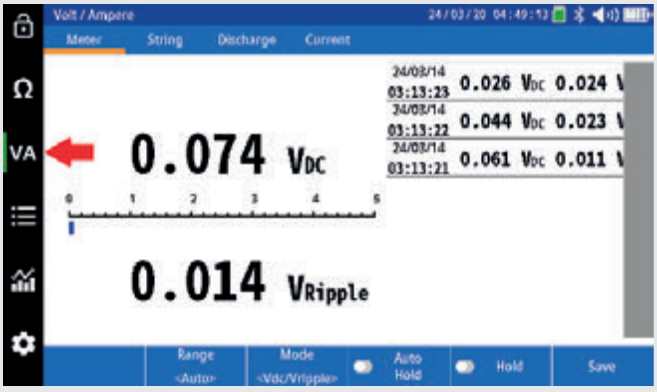
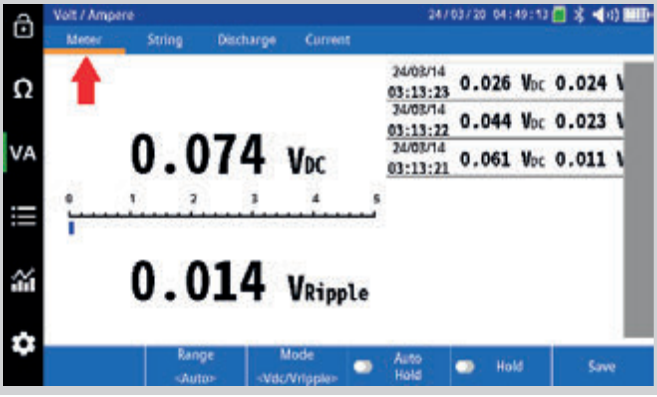
13. Measuring battery (DC) float and (AC) ripple voltages and currents

The BITE5 ADVANCED can be used to measure and record any of the following,

1. DC Voltage (Up to 1000Vdc)
2. AC Voltage (Up to 600Vac)
3. DC Current from 1A to 1000A.
4. AC Current 1A to 100A

13.1 VA Meter Mode

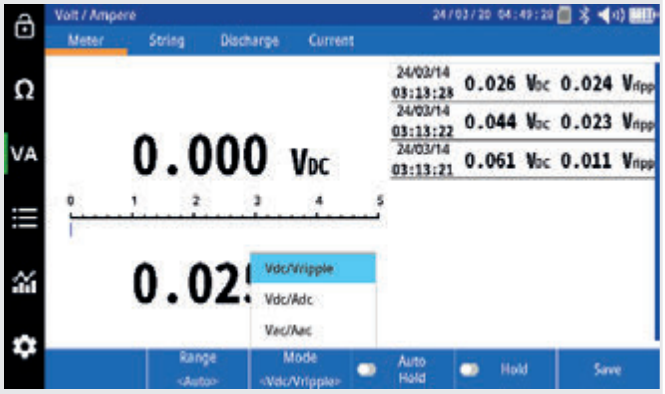
In the meter mode the BITE5 will take the above measurements but will not save the data to a programmed string configuration.

Select the VA ICON. When the VA ICON is selected it configures the unit to record voltage and current.	
When the VA ICON is selected the BITE5 Advanced will use the banana jack inputs and the current clamp input.	
Connect the banana leads and or the CT to the BITE5.	
Select "Meter	

Measuring battery (DC) float and (AC) ripple voltages and currents

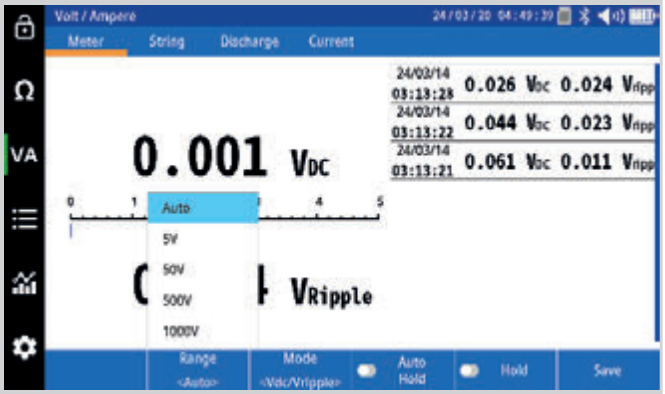
Select “Mode”

Select the type of measurement.



Select “Range”

Set the desired range.

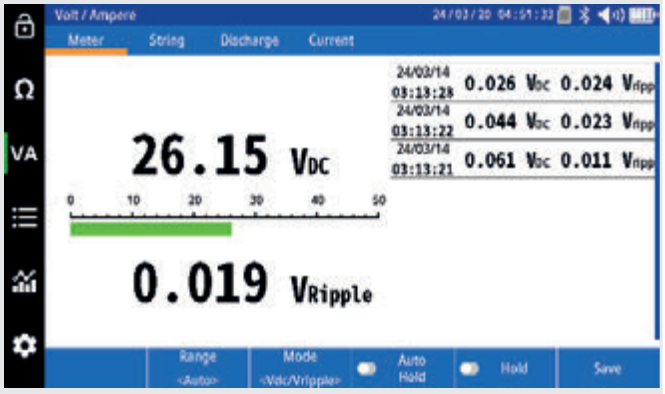


Start testing by place the banana leads or the CT on what is to be measured.

For measuring AC (ripple) current the AC CT is required.

For measuring DC (float) current the AC/DC CT is required.

The BITE5 ADVANCED will beep when the measurement is complete.



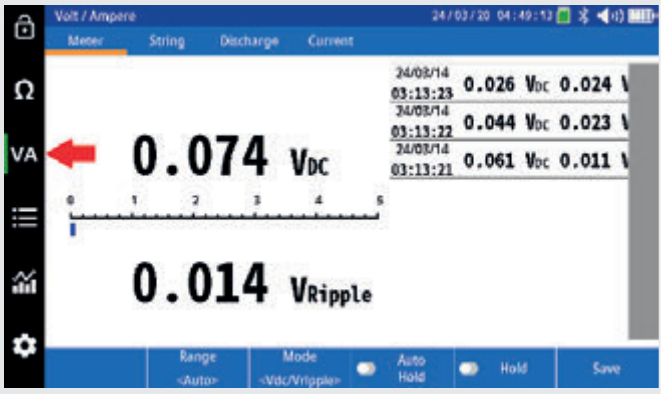
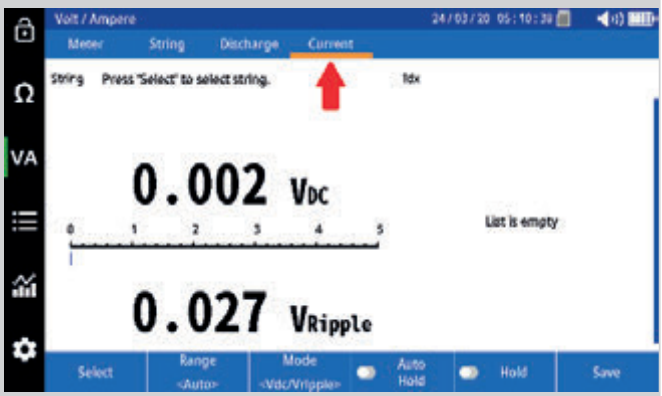
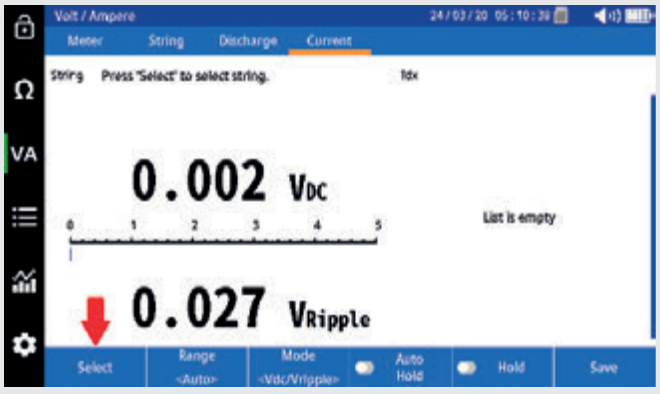
Press “Hold” to freeze the value on the screen.

Press "Save" to save the measured value.

Select "Auto Hold" and the BITE5 ADVANCED will automatically save any measurement with a date and time stamp.

14. Adding a Ripple (AC) Voltage, Ripple (AC)Current or a Float (DC) Current value to a string.

In this mode the BITE5 ADVANCED will allow take a ripple or float measurement and add that measurement to the selected string.

Select the VA ICON. When the VA ICON is selected it configures the unit to record voltage and current.	
When the VA ICON is selected the BITE5 Advanced will use the banana jack inputs and the current clamp input.	
Connect the banana leads and or the CT to the BITE5	
Select "Current"	
Select "Select".	

Select desired string. or scan the RFID tag, if used.

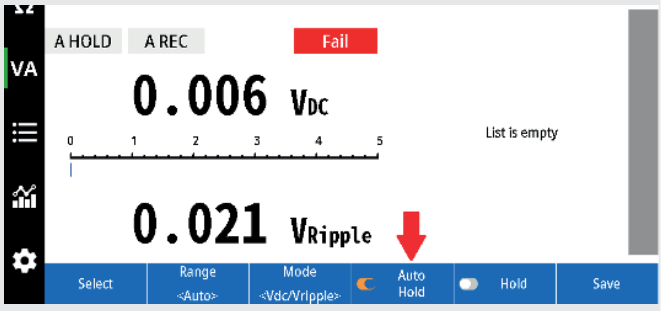
Select “Mode”

Select the type of measurement.

Select “Range”

Set the desired range.

Select “Auto Hold”.



Start testing by place the banana leads or the CT on what is to be measured.

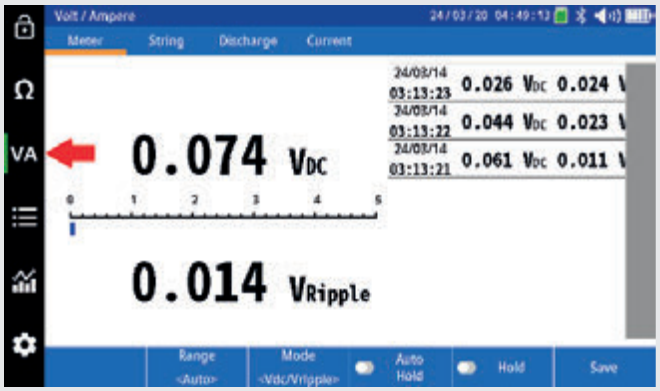
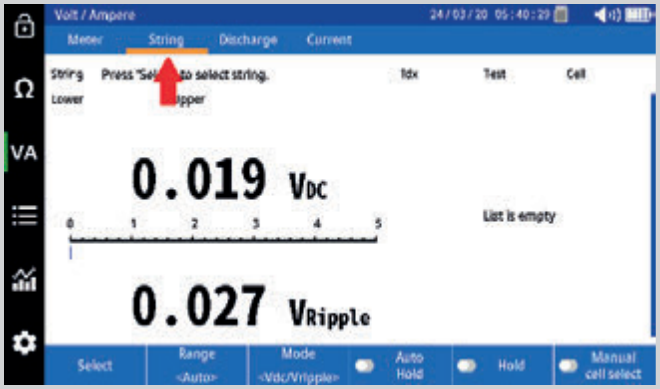
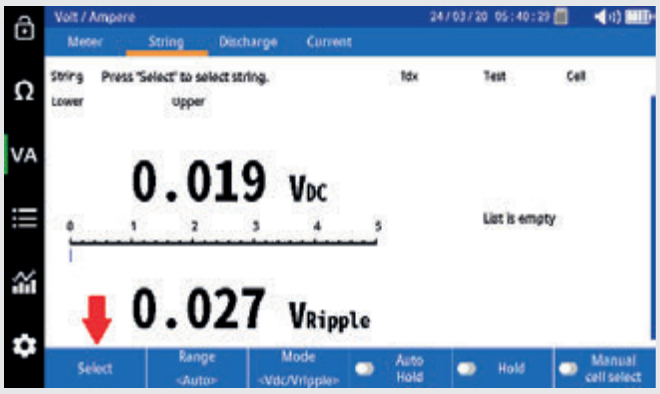
For measuring AC (ripple) current the AC CT is required.

For measuring DC (float) current the AC/DC CT is required.

The BITE5 ADVANCED will beep when the measurement is complete.

15. Measuring voltages only on a battery string.

The BITE5 ADVANCED can be used to measure and record voltage only on a battery string. The recorded data will be saved to the selected string configuration.

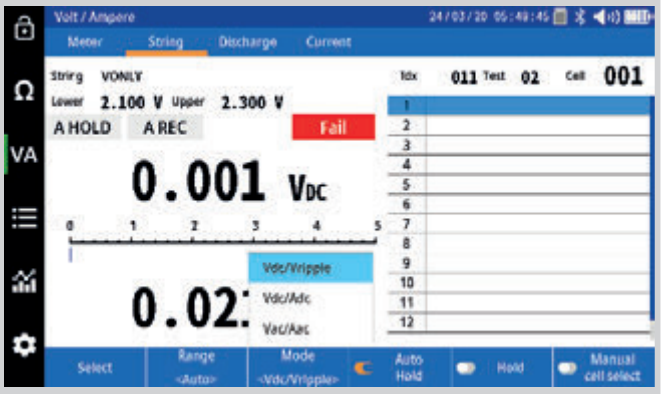
Select the VA ICON. When the VA ICON is selected it configures the unit to record voltage and current.	
When the VA ICON is selected the BITE5 Advanced will use the banana jack inputs and the current clamp input. (if desired)	
Connect the banana leads and or the CT to the BITE5	
Select “String”	
Select “Select”	

Select desired string. or scan the RFID tag, if used.

Select “New Test” to start a new test on the selected string.

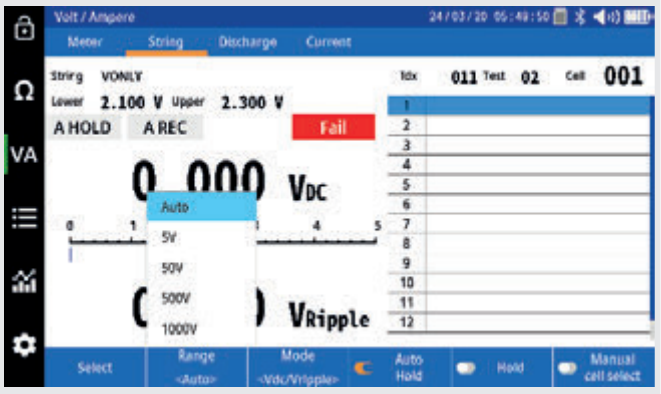
Select “Mode”

Select the type of measurement.

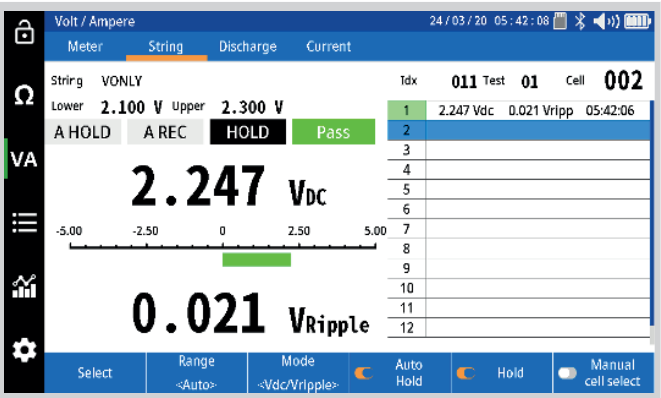
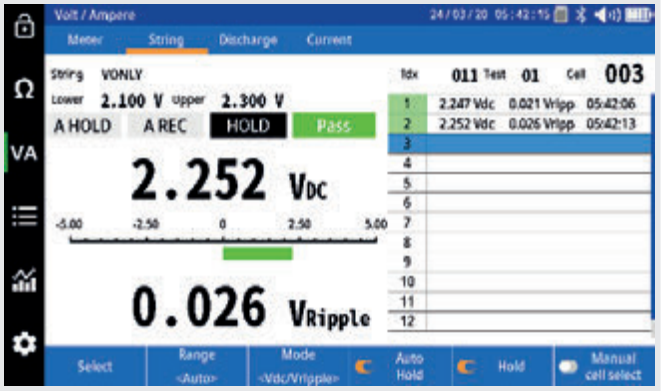
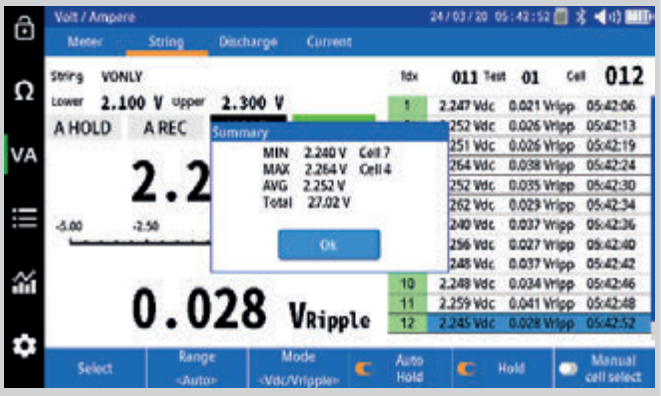


Select “Range”

Set the desired range.



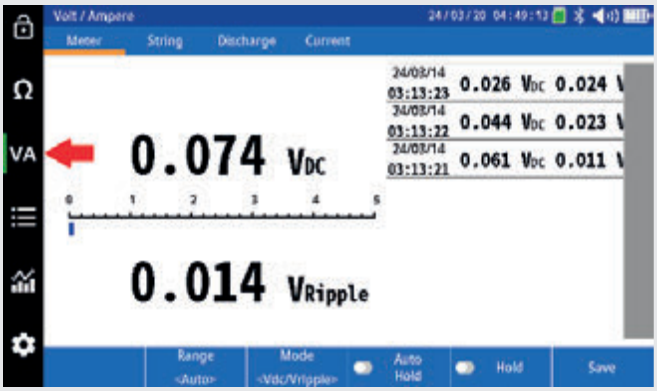
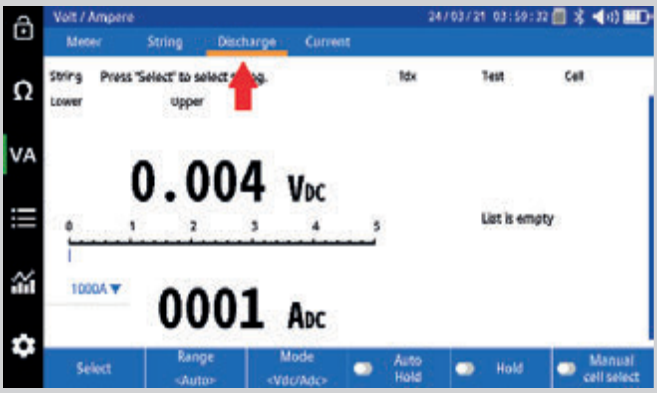
Measuring voltages only on a battery string.

Start testing by place the banana probes across the first cell. The BITE5 ADVANCED will automatically save the value.	
Proceed to the next cell. The BITE5 ADVANCED will automatically save and number the measured values.	
Continue through the string until the last cell is measured. At this point the BITE5 will display a summary of the test.	

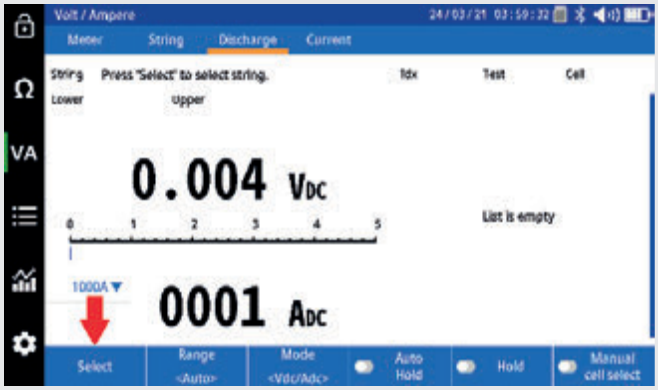
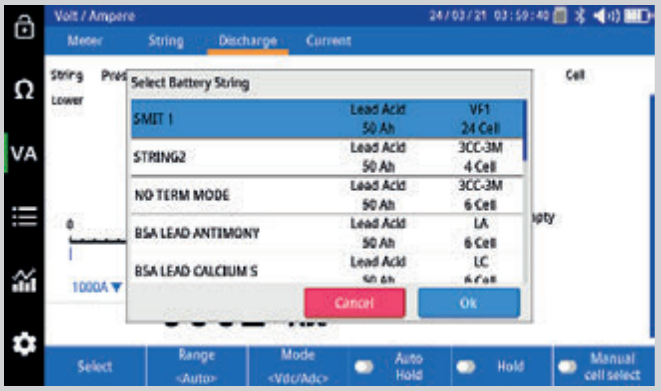
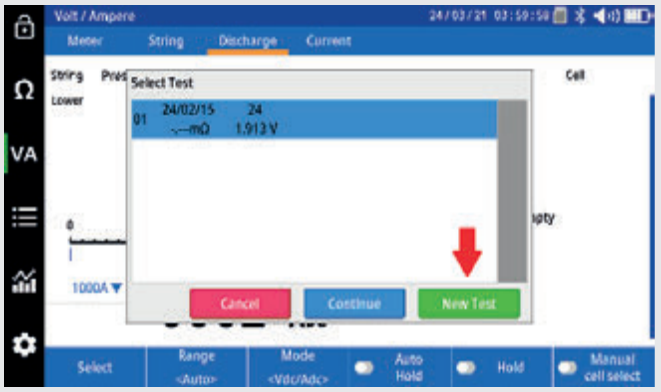
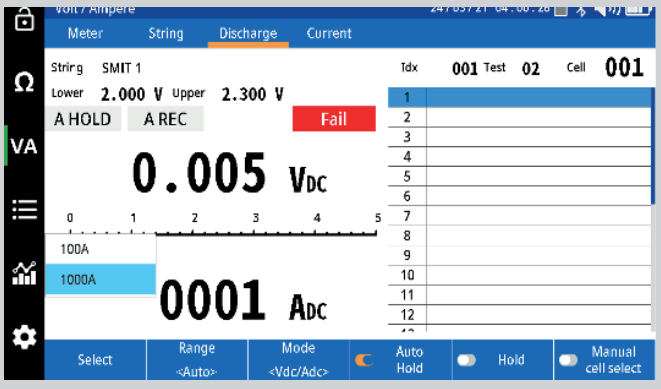
16. Performing a discharge test

The BITE5 ADVANCED can be used in conjunction with the Megger Torkel discharge tester. Program the Torkel for the desired discharge test. Place the Torkel across the battery string and start the discharge test. The BITE5 ADVANCED can then be used to take manual measurements of the cell voltage throughout the discharge process.

In this mode, the unit will record the DC voltage of each cell as well as the DC current through the string if the optional Hall Effect CT is used.

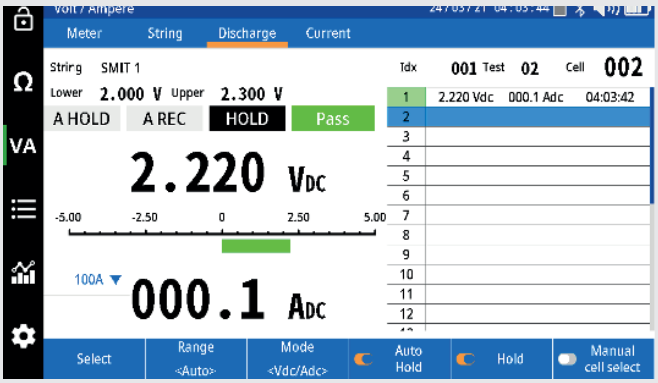
Select the VA ICON. When the VA ICON is selected it configures the unit to record voltage and current.	
When the VA ICON is selected the BITE5 Advanced will use the banana jack inputs and the current clamp input. (if desired)	
Connect the voltage leads to voltage inputs of the BITE5 ADVANCED. If measuring current, then plug the CT into the BITE5 ADVANCED CT input.	
Select “Discharge.”	

Performing a discharge test

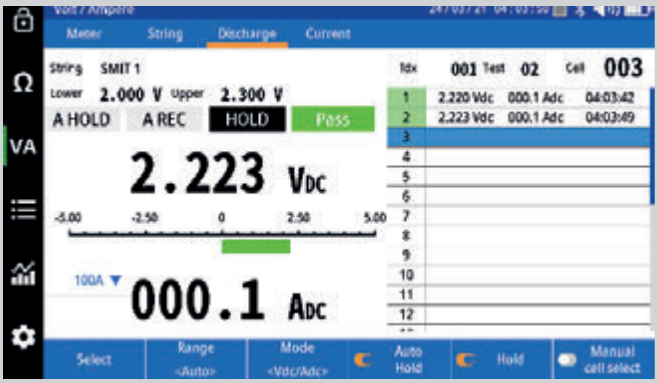
Select “Select”	
Select desired string. or scan the RFID tag, if used.	
Select “New Test” to start a new test on the selected string.	
If using the CT, set the correct range on the BITE5 ADVANCED.	

Start the discharge on the load bank.

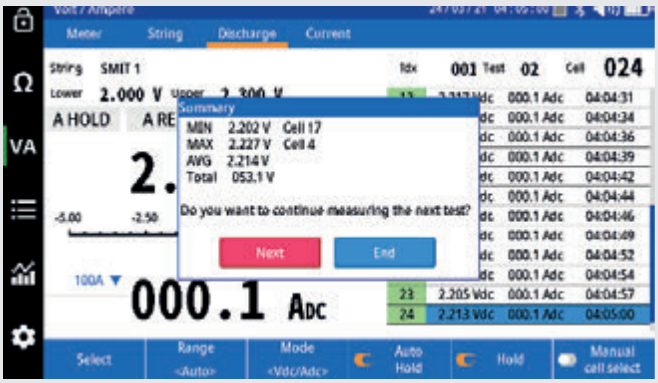
Take measurement of the first cell. The measurements will be saved with a date and time stamp.



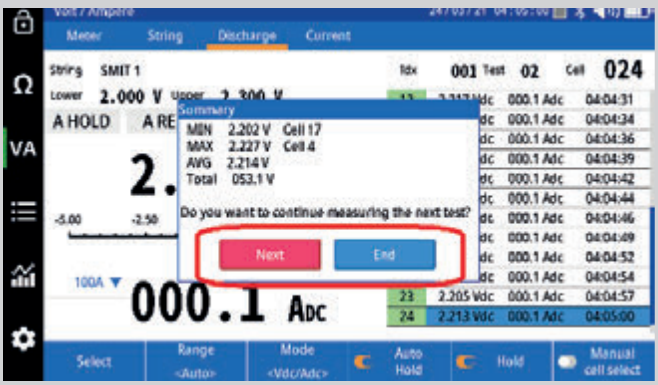
Take measurement of each following cell. Each measurement shall be saved in sequence with a cell number, date, and time stamp.



Continue through the string until the last cell is measured. At this point the BITE5 will display a summary of this pass through the string.



The unit will then prompt the user to either end the test or select “next” to perform the next pass through the string. Press when ready to perform another pass through the string. Press END to end the test.

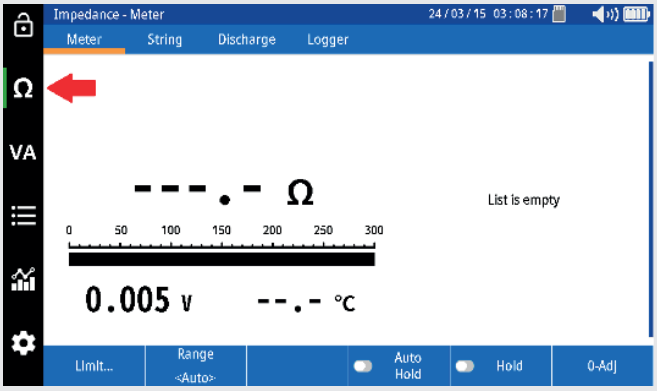
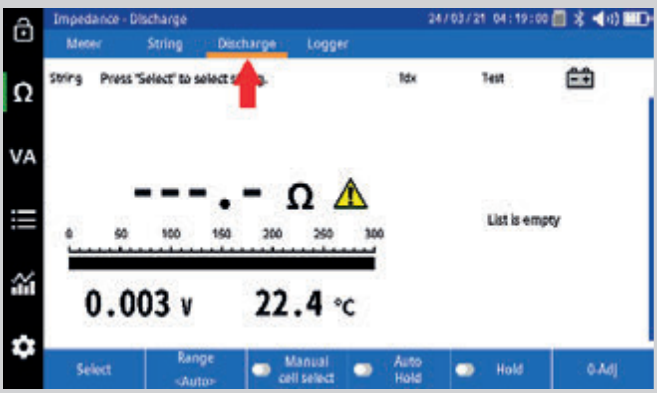


17. Performing an impedance and discharge test (special testing)

The BITE5 ADVANCED can measure the voltage and temperature and impedance throughout a discharge test. Performing this test will allow the trending of the cell impedance throughout the discharge process. This will allow the operator to establish an ohmic value that correlates with the discharged battery. This value can then be set as the ohmic alarm limit for the string.

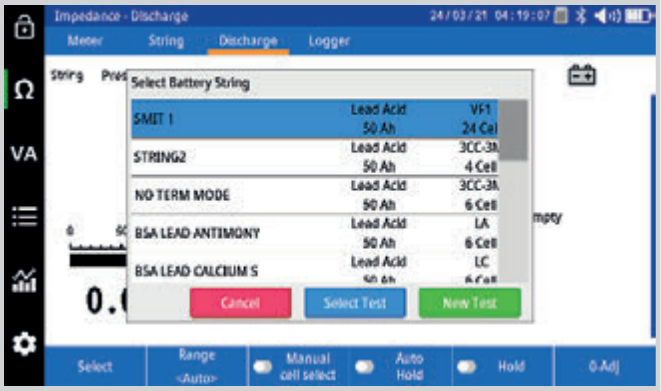
Program the Torkel for the desired discharge test. Place the Torkel across the battery string and start the discharge test. The BITE5 ADVANCED can then be used to take manual measurements of the cell voltage throughout the discharge process.

In this mode, the BITE5 ADVANCED will record the DC voltage of each cell as cell impedance and cell temperature.

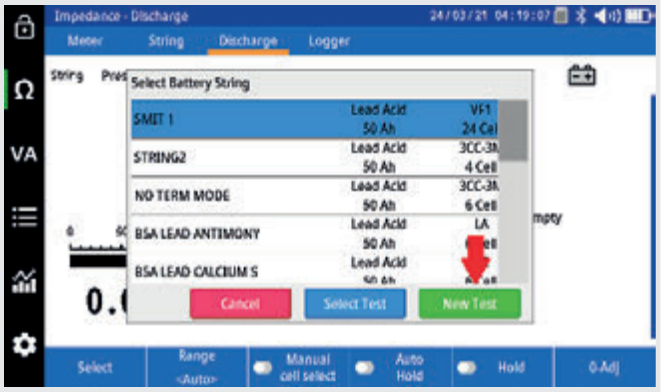
Select the Ohm (Ω) ICON. When the Ohm (Ω) ICON is selected it configures the unit to record ohmic values, voltage and temperature	
When the Ohm (Ω) ICON is selected the BITE5 Advanced will use the Duplex input.	
Connect the duplex probes to the BITE5 ADVANCED. to voltage inputs of the BITE5 ADVANCED.	
Select “Discharge.”	

Select “Select”

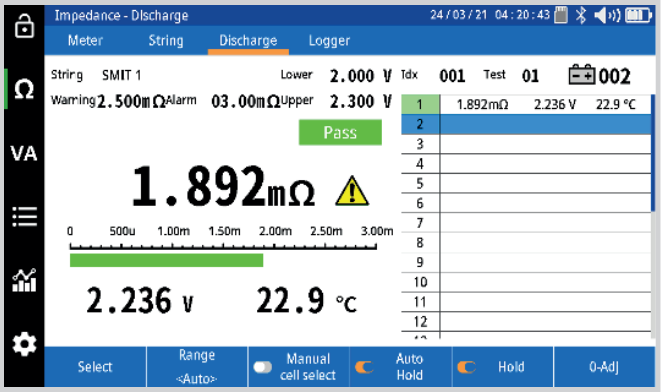
Select desired string. or scan the RFID tag, if used.



Select “New Test” to start a new test on the selected string.



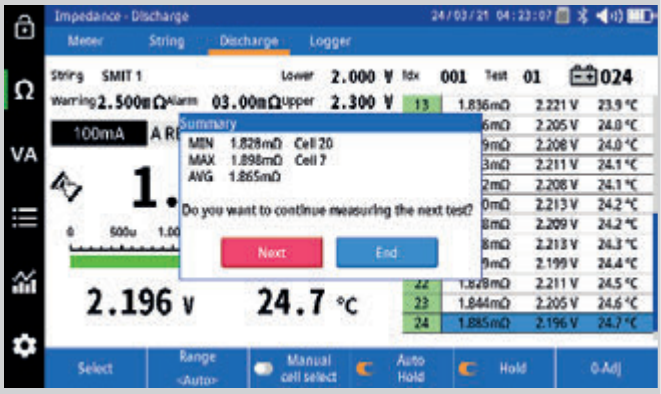
Start discharge test on load box. Take measurement of the first cell. The measurements will be saved with a date and time stamp.



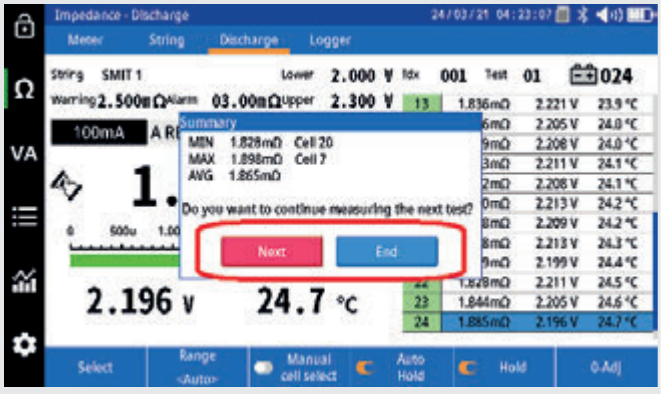
Performing an impedance and discharge test (special testing)

Take measurement of each following cell. Each measurement shall be saved in sequence with a cell number, date and time stamp.

Continue through the string until the last cell is measured. At this point the BITE5 will display a summary of this pass through the string.



The unit will then prompt the user to either end the test or select "next" to perform the next pass through the string. Press when ready to perform another pass through the string. Press END to end the test.



NOTE : This value will be associated with the internal impedance changes associated with sulfated plates. It may not correlate with other causes of cell aging such as plate corrosion.

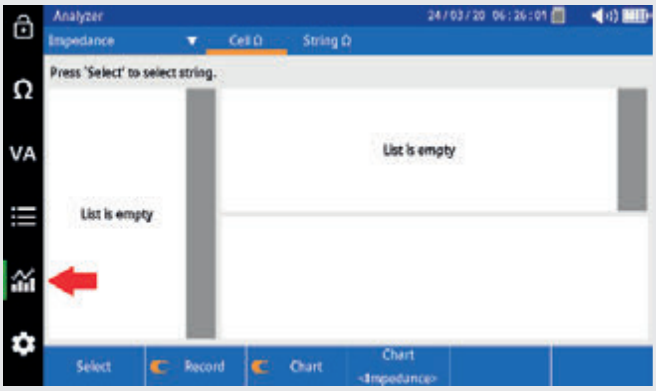
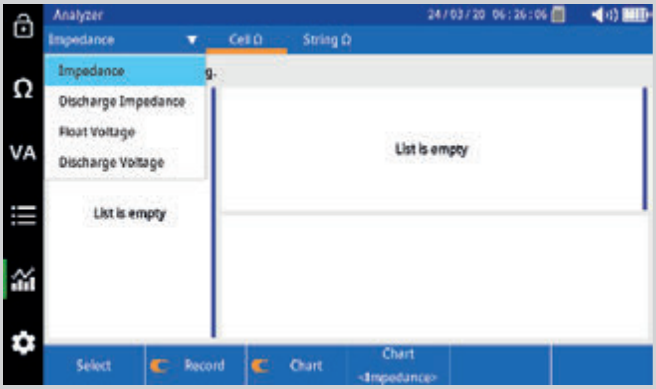
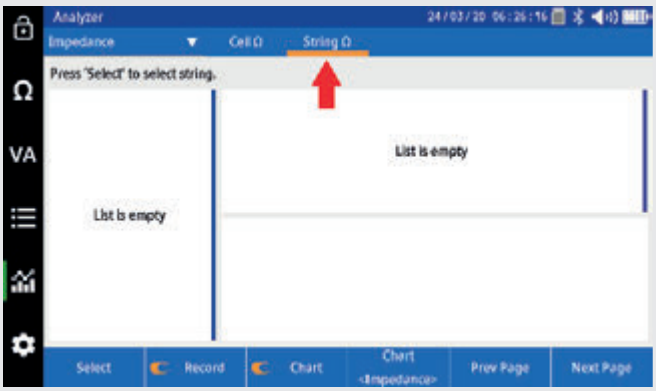
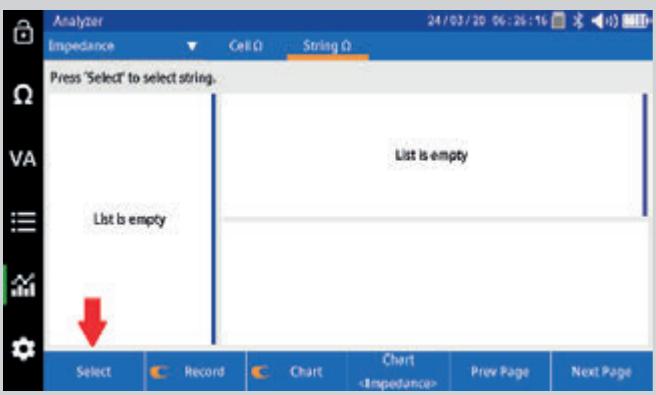
NOTE : In this mode the BITE5 ADVANCED will also measure the cell temperature during the discharge. The temperature will be taken off the negative plate. This will be valid only for sealed batteries. Flooded cells the temperature should be taken from the electrolyte.

18. Trending recorded data

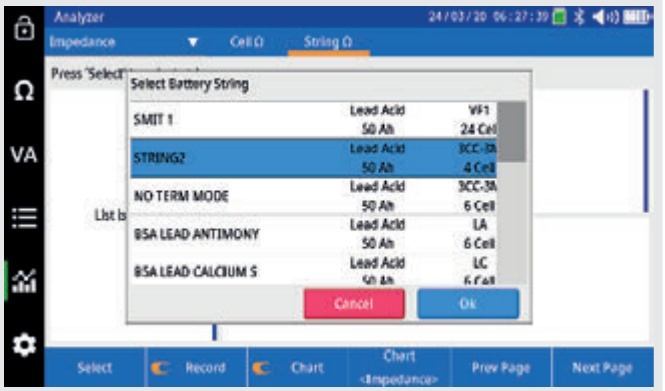
The BITE5 ADVANCED will allow trending of all recorded string data. The BITE5 ADVANCED will trend string data; the value of each cell during a single test. The BITE5 ADVANCED can also trend the all the historical test data for each individual cell.

18.1 Trending String Test Data

Trending string data will trend all the cells on the X axis for each individual test.

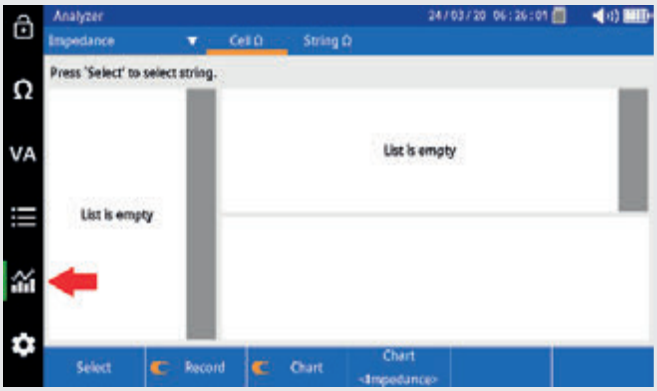
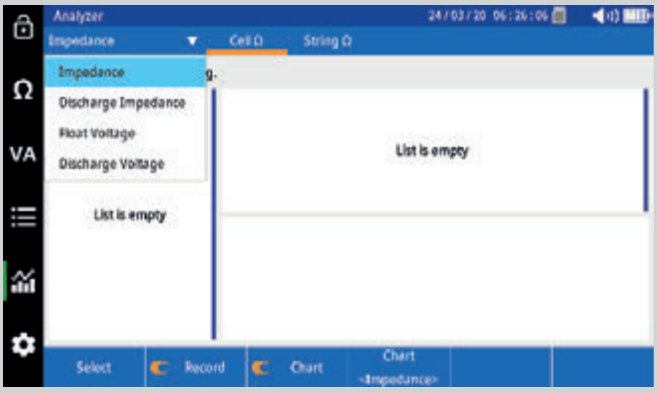
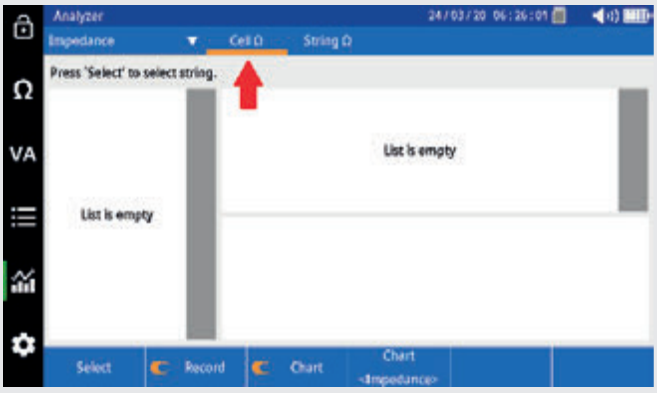
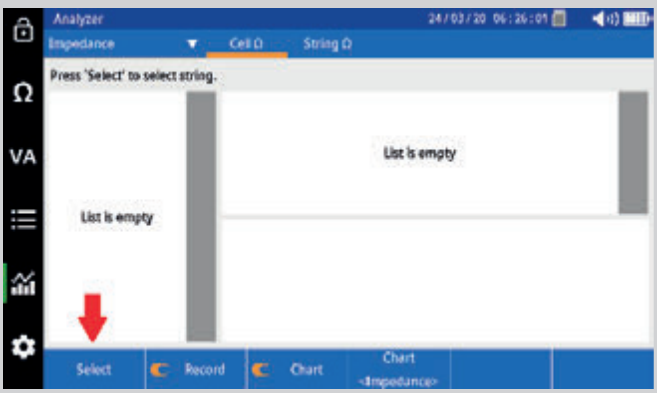
On the BITE5 ADVANCED select the chart ICON.	
On the drop down menu select the desired tested trend to view. Impedance: Trends data for impedance tests. Discharge Impedance: Trends data for impedance data recorded during a discharge test. Float Voltage: Trends data for a voltage only string test. Discharge Voltage: Trends voltage data that was recorded during each pass through a discharge test.	
Select "String".	
Select "Select".	

Trending recorded data

Select the desired battery string to view. Then press OK.	
Select desired test in the left column.	
Select "Chart" to change the parameter being trended.	

19. Trending Cell Test Data

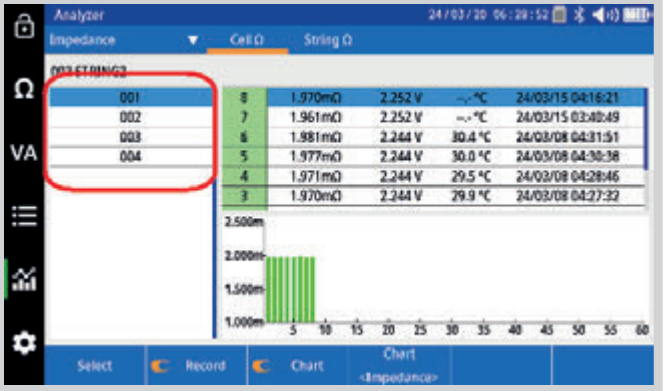
Trending cell data will trend all the measured historical values on the X axis for each cell in the string..

On the BITE5 ADVANCED select the chart ICON.	
On the drop-down menu select the desired tested trend to view. Impedance: Trends data for impedance tests. Discharge Impedance: Trends data for impedance data recorded during a discharge test. Float Voltage: Trends data for a voltage only string test. Discharge Voltage: Trends voltage data that was recorded during each pass through a discharge test.	
Select "Cell"	
Select "Select".	

Trending Cell Test Data

Select the desired battery string to view. Then press OK.

Select desired cell in the left column.



Select “Chart” to change the parameter being trended.

20. Viewing a record

The BITE5 ADVANCED allows the viewing of various recorded values or records. These records include the following:

Meter Ω - These will be the individual recorded impedance measurements that were made with the BITE5 ADVANCED. These recorded values are not associated with any battery strings.

String Ω - These will be the recorded values of individual impedance tests made on strings.

D Ω String - These will be the recorded values of individual impedance measurements made during a discharge test on a string.

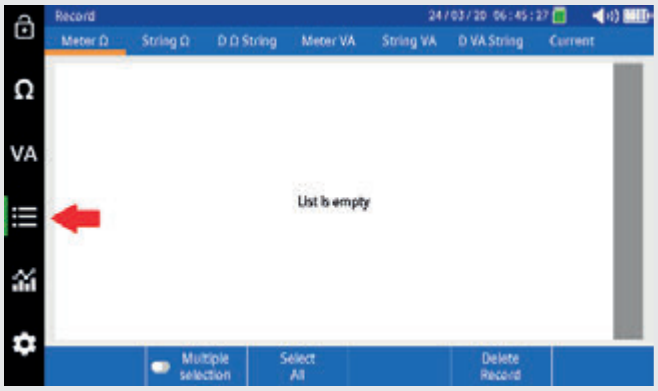
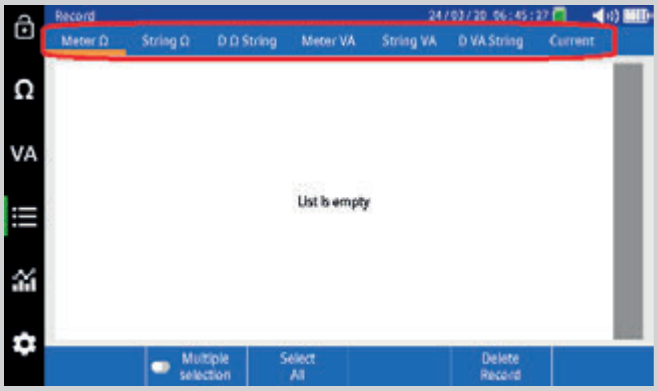
Meter VA - These will be the individual recorded voltage and current measurements that were made with the BITE5 ADVANCED. These recorded value are not associated with any battery strings.

String VA - These will be the recorded values of voltage and current measurements made on strings.

D VA String - These will be the recorded values of the voltage and current measurements made during a discharge test on a string.

Current – Will display current measurements made on a string.

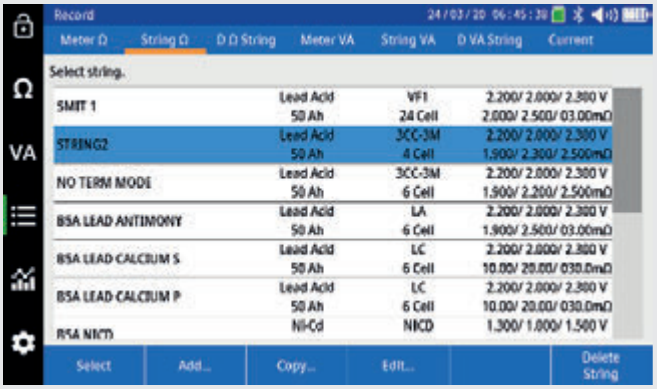
20.1 Viewing records

On the BITE5 ADVANCED select the record ICON.	
Select desired type of data to view. (See above for data types.)	

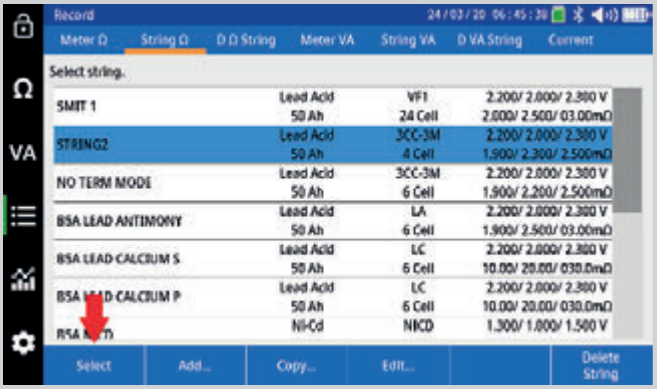
Viewing a record

Select the desired string.

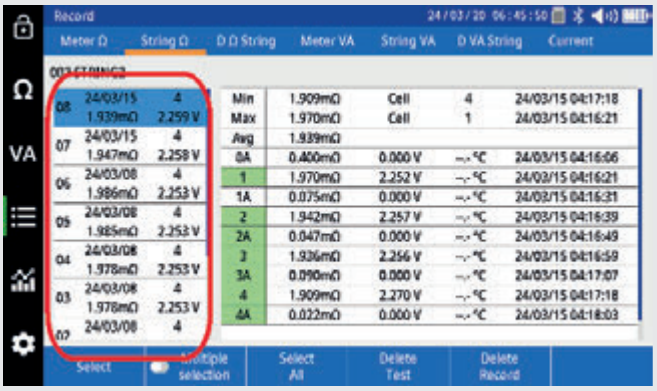
NOTE: If “Meter Ω” or “Meter VA” was selected no string needs to be selected. Recorded Meter data is not associated with a string. Therefore, all recorded meter data is displayed.



Press “Select”.



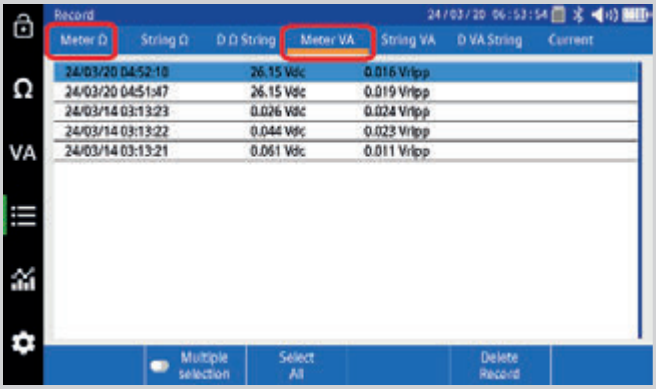
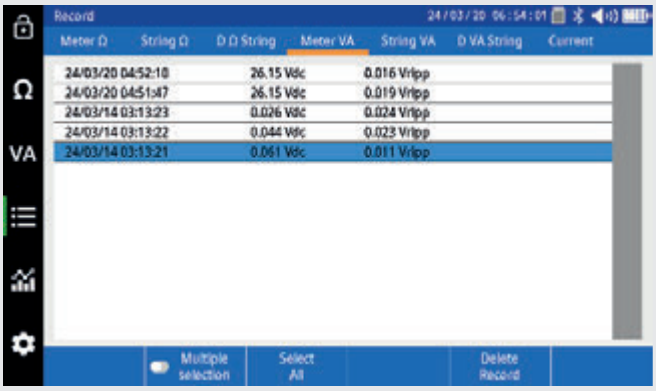
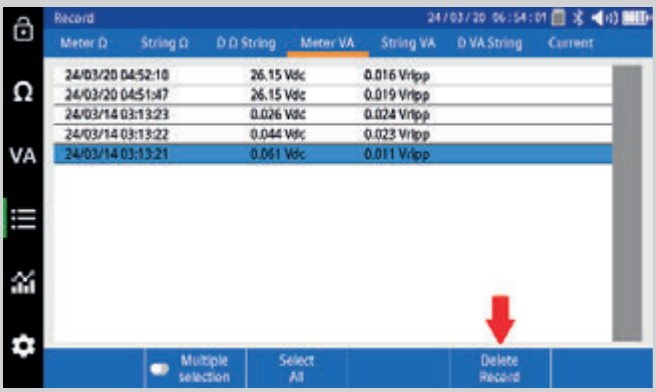
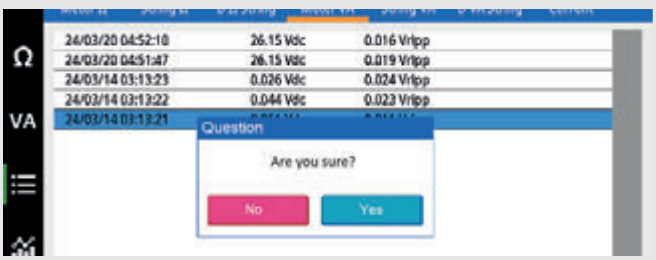
Select desired test in the left column.



21. Deleting recorded meter data

21.1 Deleting Meter Ω and Meter VA Ω data

This refers to recorded ohmic or voltage measurements that are not associated with a battery string.

On the BITE5 ADVANCED select the record ICON.	
Select either Meter Ω or Meter VA.	
Select the desired measurement to delete. NOTE: To deleted all measurements, select "Select All".	
Press "Delete Record"	
A window will open asking "Delete Record?". Select "Yes" to delete record.	

21.2 Deleting recorded string data

This refers to measurements that are saved to a configured string

This can include the following.

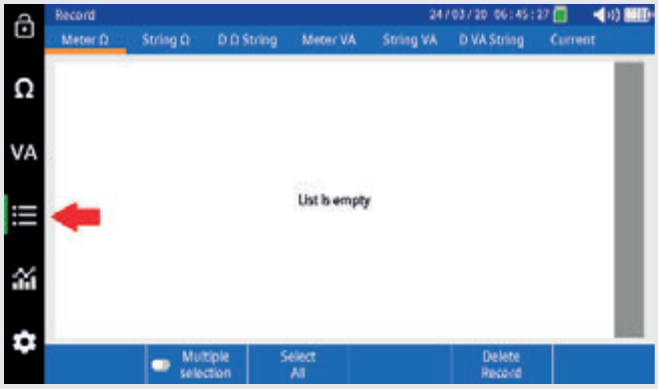
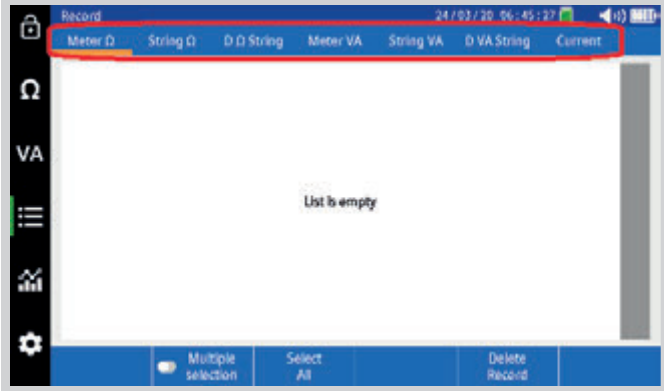
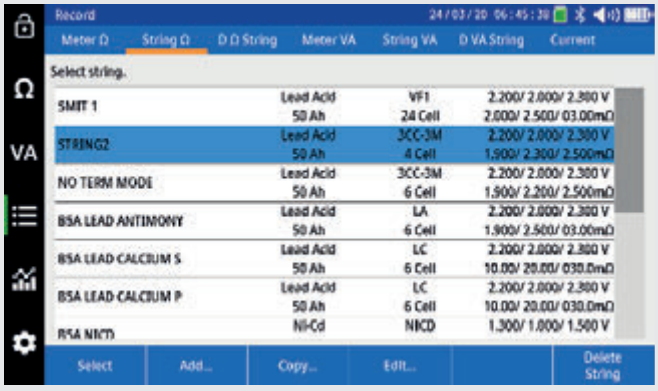
String Ω These will be the recorded values of individual impedance tests made on strings.

D Ω String These will be the recorded values of individual impedance measurements made during a discharge test on a string.

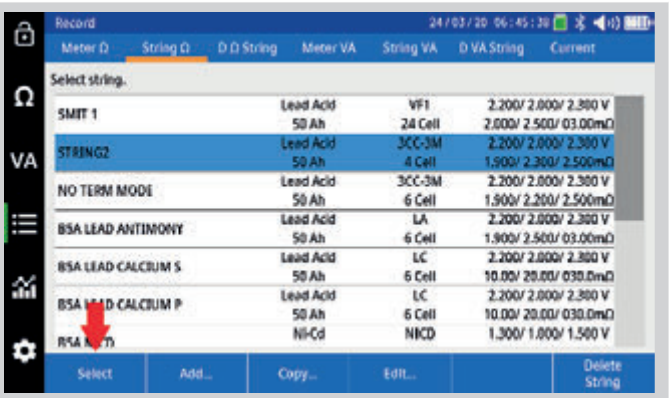
String VA These will be the recorded values of voltage and current measurements made on strings.

D VA String These will be the recorded values of the voltage and current measurements made during a discharge test on a string.

Current Will display current measurements made on a string.

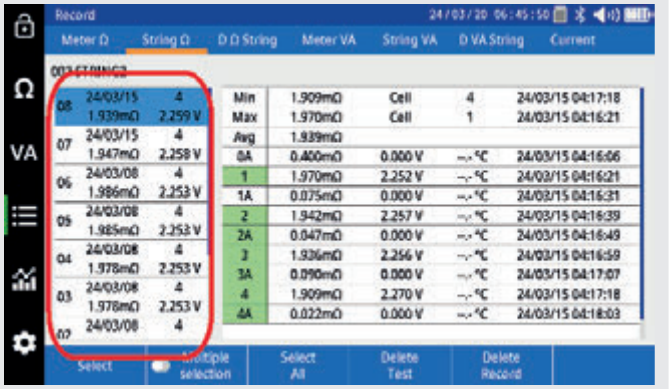
On the BITE5 ADVANCED select the record ICON.	
Select the desired type of data to delete. (See above).	
Select the desired string the data is to be deleted from.	

Press “Select”

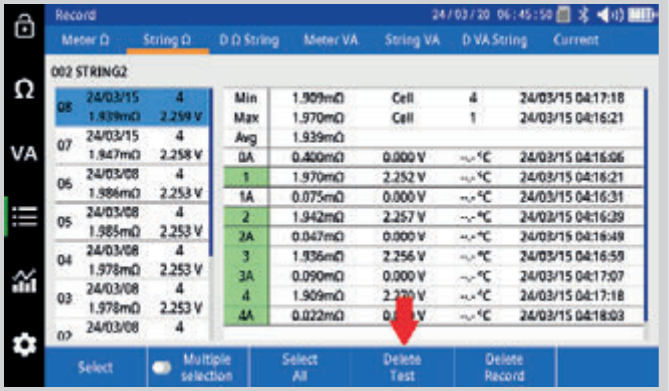


Select the desired test to delete

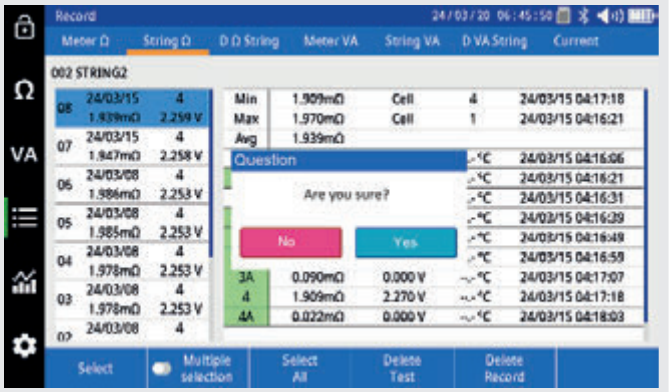
NOTE: To delete all tests select “Select All”.



Press “Delete Test”

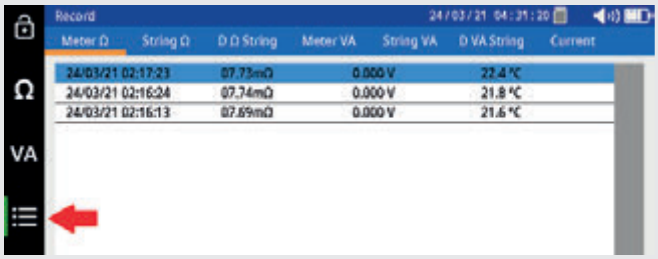
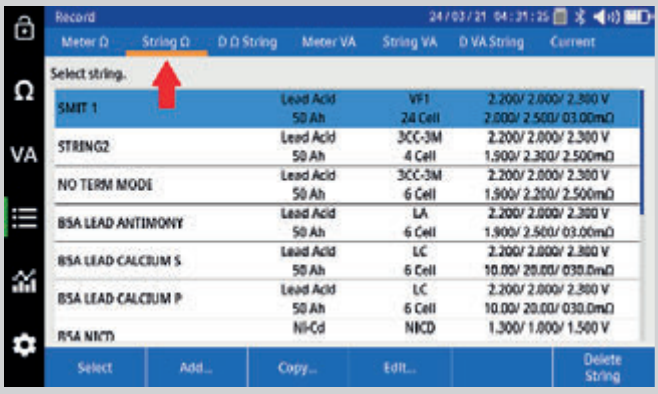
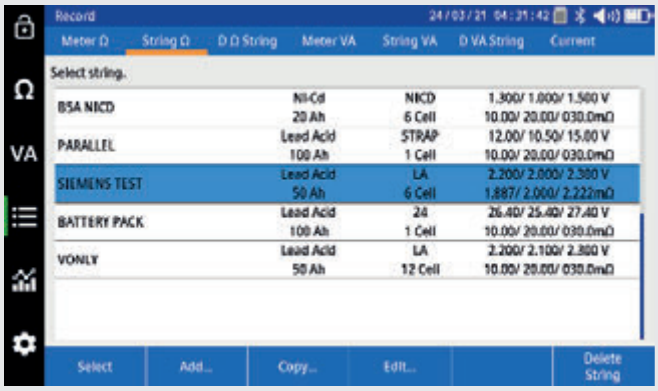
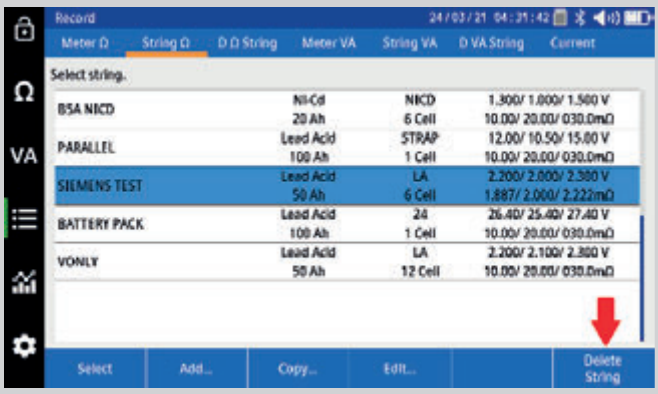
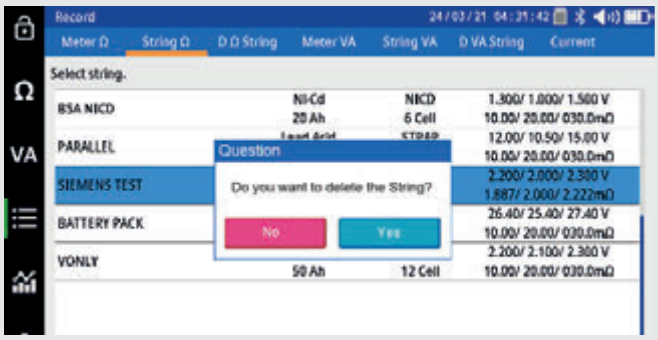


A window will open asking “Do you want to delete test?”. Select “Yes” to delete the test.



21.3 Deleting a string configuration

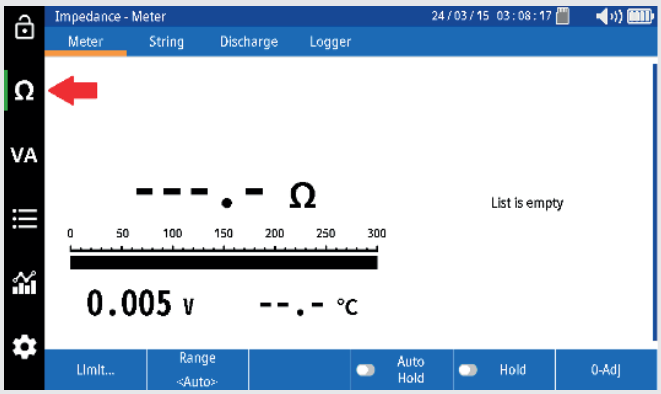
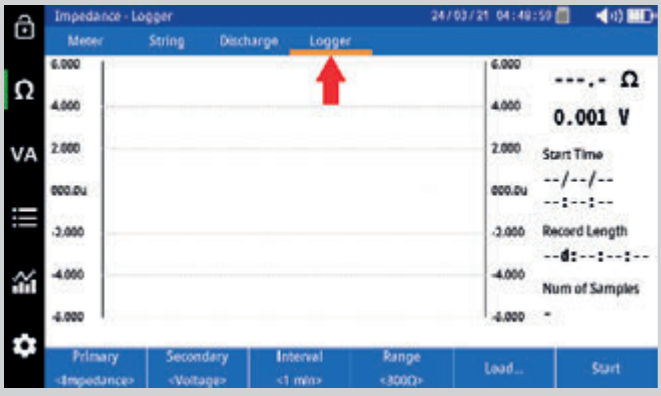
This allows deletion of an entire string configuration.

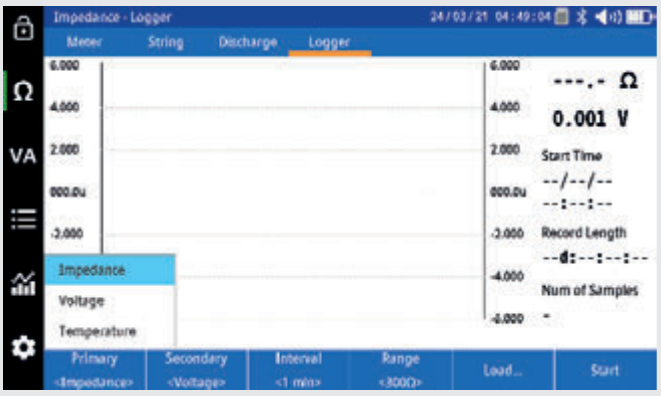
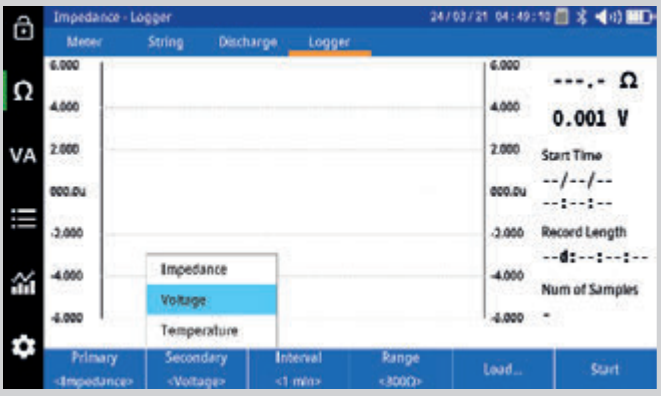
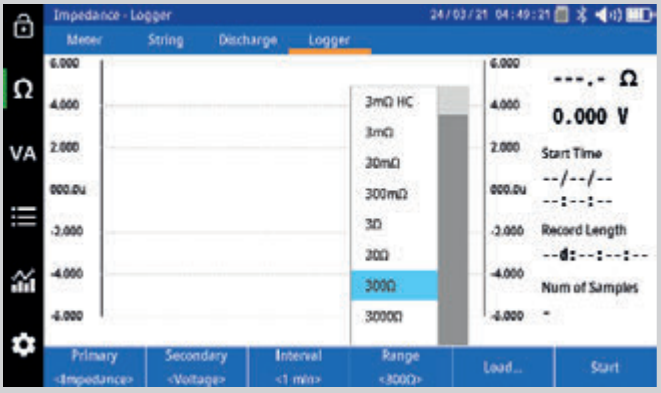
On the BITE5 ADVANCED select the record ICON.	
Select "String Ω"	
Select desired string to delete.	
Select "Delete String""	
A window will open asking "Do you want to delete the string?". Select "Yes" to delete the test.	

22. Data Logging

The BITE5 Advanced provides data logging capabilities. This allows for prolonged automatic logging of impedance, voltage and temperature values.

22.1 Logging Data

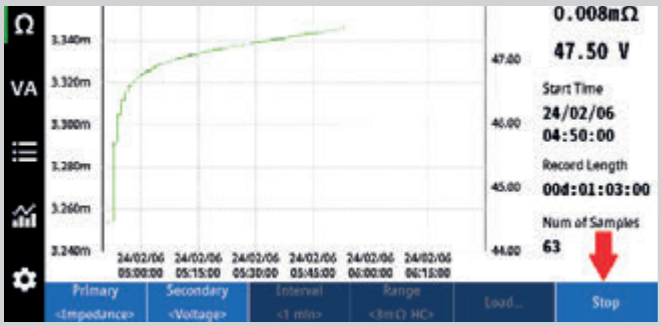
Select the Ohm (Ω) ICON. When the Ohm (Ω) ICON is selected to configures the unit to record ohmic values, voltage and temperature.	
When the Ohm (Ω) ICON is selected the BITE5 Advanced will use the Duplex input.	
Connect the Duplex Kelvin leads to the BITE5.	
Select "Logger"	

Select the "Primary" value to record. (Impedance, Voltage or Temperature)	
Select the "Secondary" value to record. (Impedance, Voltage or Temperature)	
Select "Interval" and then desired recording interval.	
Select "Range" and then desired recording range.	

Place the Duplex Kelvin Leads across the load.

Press “Start” to begin recording.

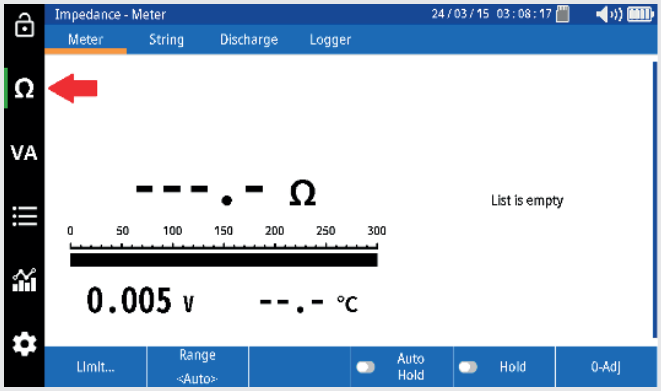
Press “Stop” when complete.



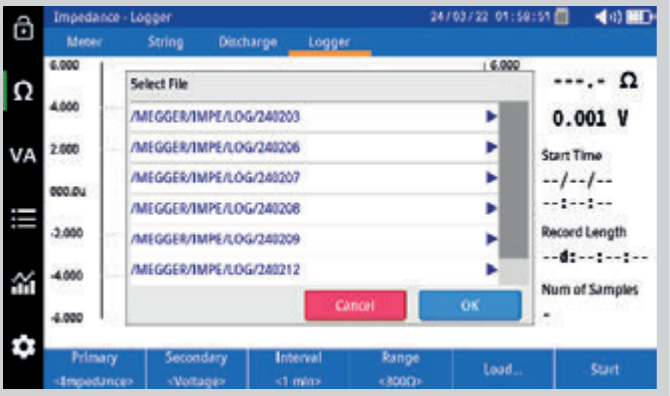
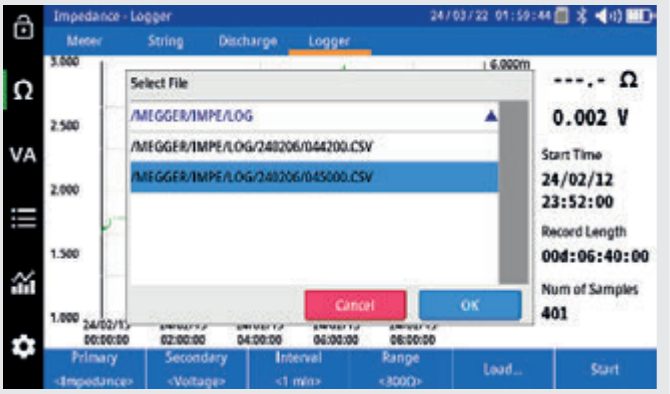
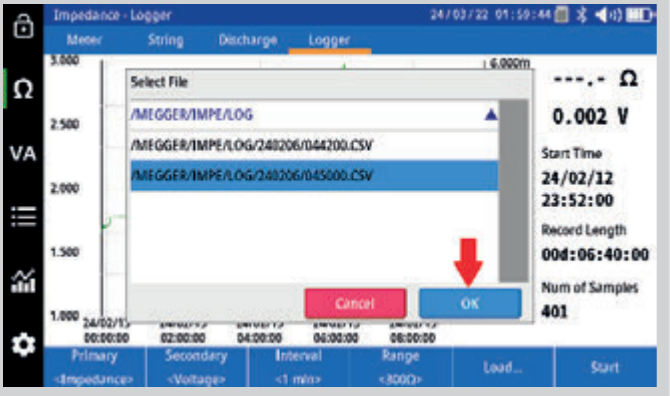
22.2 Viewing a Recorded Data Log

Select the Ohm (Ω) ICON.

When the Ohm (Ω) ICON is selected to configures the unit to record ohmic values, voltage and temperature.



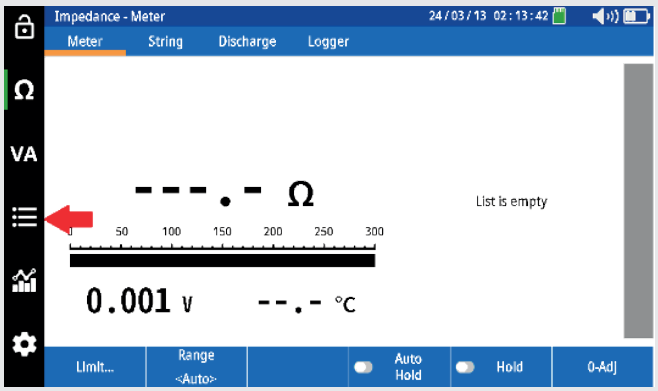
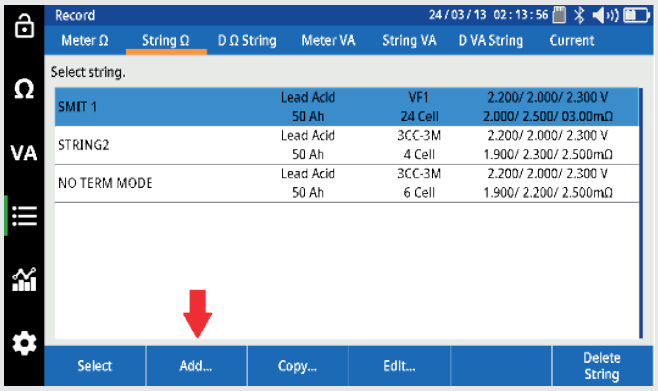
Select “Logger”

Select “Load”	
Select the date of the recording.	
Select the desired recording.	
Select “OK”	

23. RFID Tags

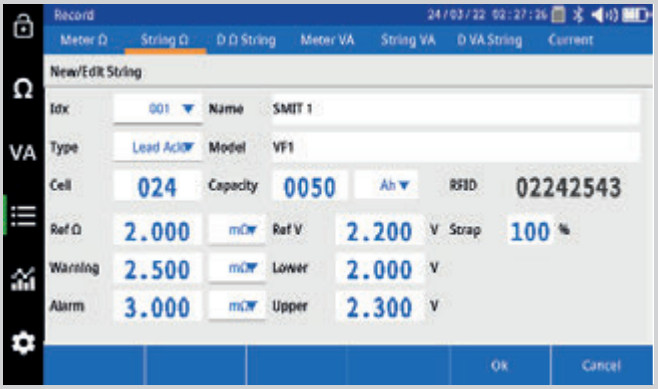
The BITE5 ADVANCED supports the use of RFID tags. A tag can be configured and placed on a battery string. The operator can then scan the RFID tag with the BITE5 ADVANCED and then proceed to start testing.

23.1 Configuring a RFID tag. for new battery string configuration.

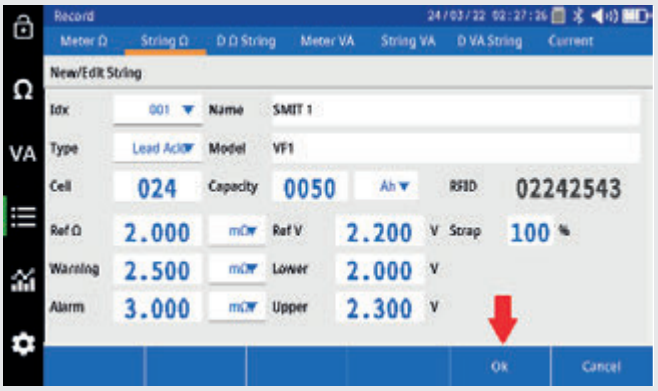
Select the RECORD ICON.	
Select "String Ω".	
Select "Add…"	
Program the fields in the in the string configuration (See the String Configuration Section of this manual for details)	

When complete scan the RFID tag by placing near the back on the BITE5 ADVANCED. An audible beep will be made when the tag is read.

The RFID tag number will now show up on the configuration screen. Now when this tag is scanned this battery string configuration will be called.

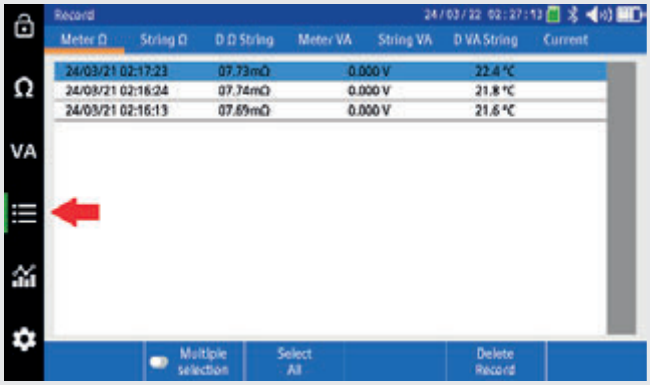


Select "OK" to save.

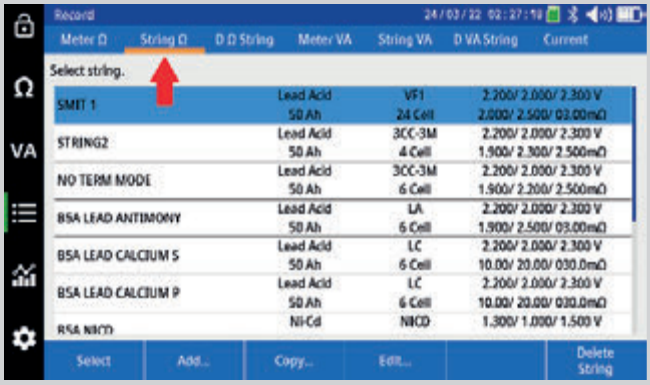


23.2 Configuring a RFID tag. for an existing battery string configuration.

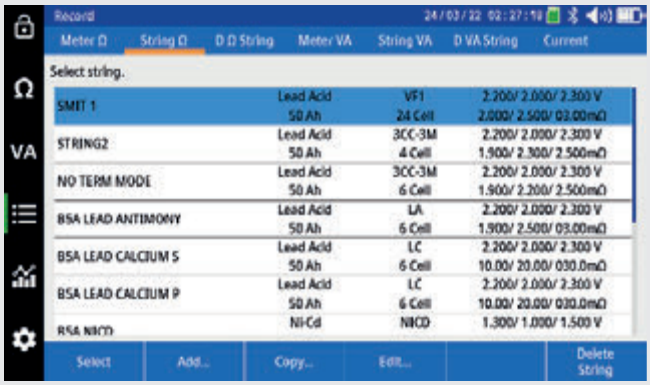
Select the RECORD ICON.



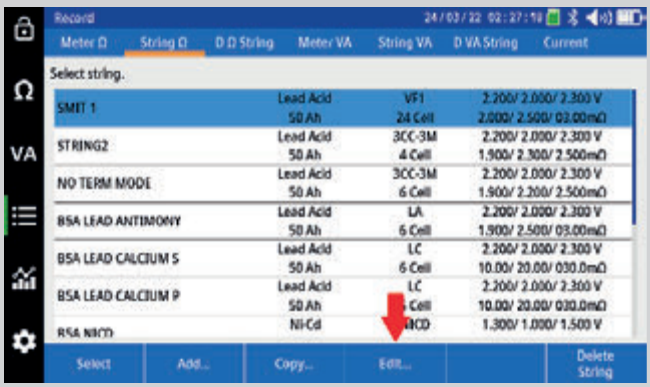
Select "String Ω".



Select the desired sting.



Select "Edit…"



RFID Tags

When complete scan the RFID tag by placing near the back on the BITE5 ADVANCED. An audible beep will be made when the tag is read.

The RFID tag number will now show up on the configuration screen. Now when this tag is scanned this battery string configuration will be called.

Select “OK” to save.

24. Saving a screen snapshot

The BITE5 ADVANCED allows you to save screen images as bitmaps.

To do this, momentarily press and release the Power ON/OFF button.

The displayed screen shall be saved to the SD card as a bitmap file. The bitmap will be located at the following path.

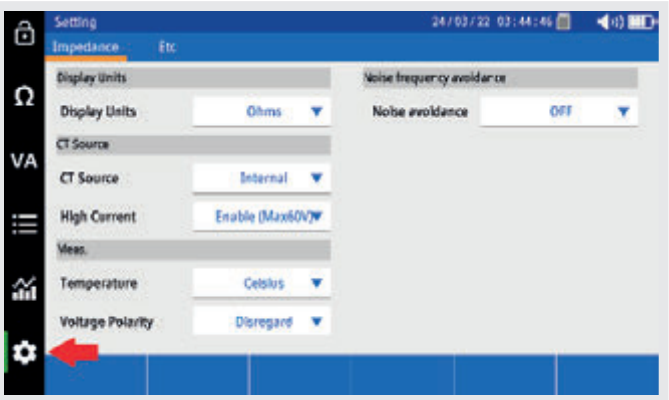
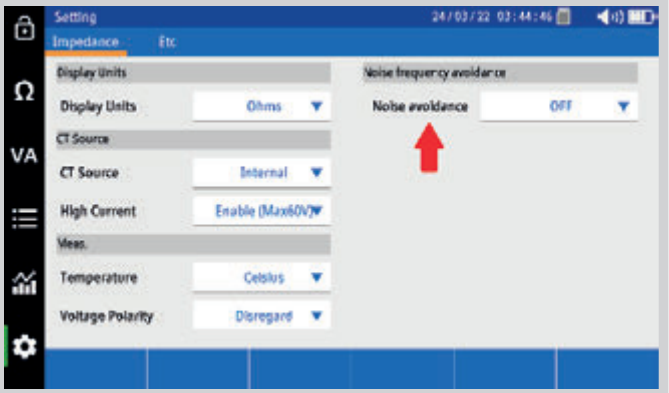
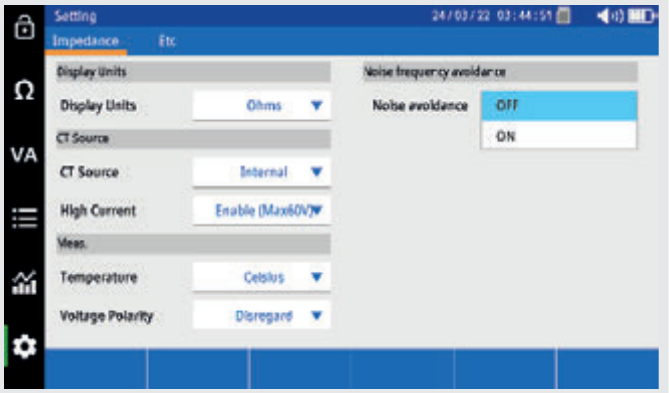
MEGGER / SCREENS

25. Noisy Strings.

Excessive electrical noise on strings can cause interference to the battery ohmic measurements. This is can be typical on UPS systems.

Noise can cause extended measurement times due to elongated settling times. In extreme cases high signal to noise ratios may not allow a measurement.

To address this situation a noise avoidance feature can be enabled on the BITE5 ADVANCED.

Select the Setting ICON	
Select “Noise Avoidance”	
Select “ON” This changes injected frequency. This should have a minimal effect on the measurement but may allow the instrument to better distinguish the signal from the system noise.	

26. Specifications

Specification	Detail
Input power	
AC/Adapter	
Input	100 – 240 V AC (50/60 Hz)
Output	12 V DC at 2.5 A
Battery	
Li-ion rechargeable pack > 5.2Ah	
Voltage rating	7.2 V
Charge time	4 hrs
Battery life	> 8 hrs
	300 charge/discharge cycles

Internal impedance

Range	Resolution	Accuracy
3 mΩ	1 µΩ	+/- 1 % of reading +/- 10 digits
30 mΩ	10 µΩ	+/- 0.8 % of reading +/- 10 digits
300 mΩ	100 µΩ	+/- 0.8 % of reading +/- 10 digits
3 Ω	1 mΩ	+/- 0.8 % of reading +/- 10 digits
30 Ω	10 mΩ	+/- 0.8 % of reading +/- 10 digits
300 Ω	100 mΩ	+/- 0.8 % of reading +/- 10 digits

Voltage DC/AC

Range	Resolution	Accuracy
5 V DC	0.001 V	+/- 0.5 % of reading +/- 5 digits
50 V DC	0.01 V	
500 V DC	0.1 V	
1000 V DC	1 V	
5 V AC	0.001 V	+/- 0.75 % of reading +/- 10 digits (40 Hz – 100 Hz)
50 V AC	0.01 V	
500 V AC	0.1V	
600 V AC	1 V	

Current DC/AC

Range	Resolution	Accuracy
4 A DC	0.001 A	+/- 0.5 % of reading +/- 1 digit + (CT Tolerance)
40 A DC	0.01 A	
400 A DC	0.1 A	+/- 0.5 % of reading +/- 5 digits + (CT Tolerance)
1000 A DC	1 A	
4 A AC	0.001 A	+/- 0.75 % of reading +/- 1 digit + (CT Tolerance)
40 A AC	0.01 A	
400 A AC	0.1 A	+/- 0.75 % of reading +/- 10 digits + (CT Tolerance)
1000 A AC	1 A	

Temperature

Range	Resolution	Accuracy
10 °C ~ 100 °C	0.1 °C	+/-1 °C +/- 2 digits

Ripple voltage

Range	Resolution	Accuracy
0–5 V	0.001 V	+/- 0.5 % of reading +/- 10 digits (40 Hz – 10 KHz)

Specifications

Test Current	1 KHz @ 100 mA
Repeatability	0.1 %, 2 σ
Record Capacity	
Memory	8 GB up to 16 GB flash storage Impedance record: Max 1000 records VA record: Max 512 records
Environmental	
Operating	0 ~50 °C (32~122 °F)
Storage	-20 ~50 °C (-4~122 °F)
Charging temperature:	10 ~40 °C (50~104 °F)
Relative humidity	10 ~ 85 % NC non-condensing
Altitude Operational	0 ~ 2000 m
Ingress protection	IP54
Display (transmitter and receiver)	160 x 90 mm touch screen
Safety/EMC/Vibration/Compliance	
Meets the requirements of IEC61010-1, CE, UKCA	
CAT Rating:	600 V CAT III, Pollution Degree 2
Shock and vibration	EN61010-1 EN60529
IEC61010-1:2010 (3rd Ed)	
EN61010-1:2010 (3rd Ed)	
IEN61326-1:2013	
EN55011/A1:2010 (Class A)	
EN61000-3-2:2014	
EN61000-3-3:2013	
Weight/Dimensions	
Dimensions	240 x 160 x 65 mm (9.45" x 6.30" x 2.56")
Weight	0.9 kg (1.98 lbs)

27. Accessories and Equipment

OPTIONAL ACCESSORIES		
	Concentric Probe – The concentric probe allows for battery testing on batteries with safety caps or safety lugs. Users can easily access the terminals through the access hole. The concentric probe comes in two styles. One probe comes with a 11.75 mm (1/2") tip the other has a 25.4 mm (1") tip. This allows access to terminals even on batteries with the deepest safety lugs.	90043-242 (11.75mm tip) 90043-243 (25.4mm tip)
	0 to 100 A AC CT. Used for measuring and recording AC ripple current. Jaw opening 0.96" ID (24.5mm)	MCV-100B5B
	1 to 1000 A AC/DC CT. Used for measuring and recording DC float current and discharge current. Jaw opening 2 inches (52.0 mm)	MCCV-1KDC-B5B
	BITE5 extension kit for probes. Allow operator to take measurements while being able to stand safely back from the voltages being measured. Available with straight and 90 degree probes.	See ordering information for options
	3 meter right angle probe. For use with BITE5 extension kit.	90043-244
	3 meter straight probe. For use with BITE5 extension probes.	90043-245

	3 meter clip on probes. Ideal for taking measurements across entire strings.	90043-246

27.1 Included accessories

Item	Order No.
Duplex probes (with temperature probe)	90043-241
Voltage test leads	90037-576
Charger	90039-077
Neck strap	90037-529
Zero bar	90037-575
16 GB microSD card	90037-572
microSD card USB reader	90037-571
USB cable	90037-569
Stylus	90037-570
Carry bag	90037-573
Pouch bag	90037-574

27.2 Optional accessories

Item	Order No.
Concentric probe (1/2" tip)	90043-242
Concentric probe (1" tip)	90043-243
100 A AC current clamp	MCV-100B5B
1000 A AC/DC current clamp	MCCV-1KDC-B5B
3 meter right angle probe	90043-244
3 meter straight probe	90043-245
3 meter clip on probe	90043-246
Extension kit with straight probe	1016-066
Extension kit with 90 degree probe	1016-064
Extension kit with straight and 90 degree probes	1016-067

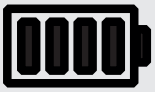
28. Maintenance

Do not leave the instrument connected to the system under test when not in use. Do not use the instrument or connect it to any external system if it shows any visible signs of damage, malfunction, or if it has been stored in unfavorable conditions. If this equipment is used in the manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

28.1 Battery charging

The BITE5 ADVANCED uses rechargeable Li-ion batteries. Only recharge batteries using the supplied power adapter. Battery charging starts once the power adapter is connected and plugged into AC. The battery charge will take approx. 4 hours to complete. If the unit is operated off of the AC adapter, then the charging time will be longer. The BITE5 ADVANCED can be left connected to the charging adapter for extended periods. The batteries will not be damaged even after full charge.

28.1.1 Battery charging status icon

Icon	Description
	Battery charging amount more than 85 %
	Battery charging amount more than 70 %
	Battery charging amount more than 50 %
	Battery charging amount more than 25 %
	Battery is fully discharged (after warning sounds, unit will shut off)
	Adapter connected, unit charging

28.2 Cleaning and Storage

Do not leave the instrument connected to the system under test when storing or cleaning.

28.2.1 Unit Cleaning

Clean with wet cloth and soft soap. Do not use organic solvents or alcohol as markings on the unit may be damaged.

28.2.2 Storage

When storing for long periods of time, there is no need to remove the battery pack. However, all batteries experience self-discharge. This will lead to a gradually draining of the batteries. For best battery life, it is recommended that batteries are charged once a month. Batteries need to be charged a minimum of once every 6 months.

28.2.3 Cleaning probes

Clean with wet cloth and soft soap. Do not use organic solvents or alcohol.

29. Calibration, Repair and Warranty

Megger operate fully traceable calibration and repair facilities to make sure your instrument continues to provide the high standard of performance and workmanship that is expected. These facilities are complemented by a worldwide network of approved repair and calibration companies, which offer excellent in-service care for your Megger products.

For service requirements for Megger instruments contact:

If the protection of an instrument has been impaired it should not be used, but sent for repair by suitably trained and qualified personnel. The protection is likely to be impaired if, for example, the instrument shows visible damage, fails to perform the intended measurements, has been subjected to prolonged storage under unfavourable conditions, or has been exposed to severe transport stresses.

New instruments are covered by a two year warranty from the date of purchase by the User, the second year being conditional on the free registration of the product. You will need to log in, or first register and then login to register your product. The second year warranty covers faults, but not recalibration of the instrument which is only warranted for one year. Any unauthorised prior repair or adjustment will automatically invalidate the warranty.

These products contain no User repairable parts and if defective should be returned to your supplier in original packaging or packed so that it is protected from damage during transit. Damage in transit is not covered by this warranty and replacement / repair is chargeable.

Megger warrants this instrument to be free from defects in materials and workmanship, where the equipment is used for its proper purpose. The warranty is limited to making good this instrument (which shall be returned intact, carriage paid, and on examination shall disclose to their satisfaction to have been defective as claimed).
Any unauthorised prior repair or adjustment will invalidate the warranty. Misuse of the instrument, from connection to excessive voltages, fitting incorrect fuses, or by other misuse is excluded from the warranty. The instrument calibration is warranted for one year.

This Warranty does not affect your statutory rights under any applicable law in force, or your contractual rights arising from a sale and purchase contract for the product. You may assert your rights at your sole discretion.

29.1 Calibration, Service and Spare Parts

For service requirements for Megger Instruments contact **Megger** or your local distributor or authorised repair centre.

Megger operates fully traceable calibration and repair facilities, to make sure your instrument continues to provide the high standard of performance and workmanship you expect. These facilities are complemented by a worldwide network of approved repair and calibration companies to offer excellent in-service care for your Megger products.

See the **last page** of this User Guide for Megger contact details.

29.2 Approved Repair Companies

A number of independent instrument repair companies have been approved to do repair work on most Megger instruments, complete with genuine Megger spare parts.

Consult the Appointed Distributor / Agent about spare parts, repair facilities and advice.

29.3 Return procedure

WARNING : DO NOT Remove the battery cells before shipping this instrument. The battery pack MUST be inside the BITE5 when it is packed for shipping.

UK and USA Service Centres

1. When an instrument requires recalibration, or in the event of a repair being necessary, a Returns Authorisation (RA) number must first be obtained from one of the addresses shown above. The following information is to be provided to enable the Service Department to prepare in advance for receipt of your instrument and to provide the best possible service to you:
   - Model (for example, BITE5).
   - Serial number (found on the display under settings, device information, or on the rear cover and by the batteries or on the calibration certificate).
   - Reason for return (for example, calibration required, or repair).
   - Details of the fault if the instrument is to be repaired.
2. Make a note of the RA number. A returns label can be emailed or faxed to you if required.
3. Pack the instrument carefully to prevent damage in transit.
4. Before the instrument is sent to Megger, freight paid, make sure that the returns label is attached or that the RA number is clearly marked on the outside of the package and on any correspondence. Copies of the original purchase invoice and packing note should be sent simultaneously by airmail to expedite clearance through customs. In the case of instruments which require repair outside the warranty period, an immediate quotation can be provided when obtaining the RA number.
5. Track the progress online.

30. Decommissioning

30.1 WEEE Directive

The crossed out wheeled bin symbol placed on Megger products is a reminder not to dispose of the product at the end of its life with general waste.

Megger is registered in the UK as a Producer of Electrical and Electronic Equipment. The Registration No is WEE/ HE0146QT.

For further information about disposal of the product consult your local Megger company or distributor or visit your local Megger website.

30.2 Battery disposal

The crossed out wheeled bin symbol placed on a battery is a reminder not to dispose of batteries with general waste when they reach the end of their usable life.

For disposal of batteries in other parts of the EU contact your local Megger branch or distributor.

Megger is registered in the UK as a producer of batteries (registration No.: BPRN00142).

Megger

This instrument is manufactured in the United States.

The company reserves the right to change the specification or design without prior notice.

Megger is a registered trademark

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