SEAWARD
GMC-INSTRUMENTS GROUP

Apollo 600+

USER MANUAL

seaward.com

TESTED. TRUSTED... WORLDWIDE

Table of Contents

1. Safety Instructions

	Read and follow these instructions carefully and completely in order to ensure safe and proper use. The instructions must be made available to all persons who use the instrument. Keep for future reference.

General

- The instrument may only be used by electro-technically trained persons (ETP) and qualified electricians in the commercial field. This device is not a consumer product.
- Observe and comply with all safety regulations which are applicable for your work environment.
- Wear suitable and appropriate personal protective equipment (PPE) whenever working with the instrument.
- The functioning of active medical devices (for example pacemakers, defibrillators) and passive medical devices may be affected by voltages, currents and electromagnetic fields generated by the tester and the health of their users may be impaired. Implement corresponding protective measures in consultation with the manufacturer of the medical device and your physician. If any potential risk cannot be ruled out, do not use the instrument.

Accessories

- Use only the specified accessories (included in the scope of delivery or listed as options) with the instrument.
- Carefully and completely read and adhere to the product documentation for optional accessories. Retain these documents for future reference.

Handling

- Use the instrument in undamaged condition only.
  Inspect the instrument before use. Pay particular attention to damage, interrupted insulation or kinked cables.
  Damaged components must be replaced immediately.
- Use the accessories and all cables in undamaged condition only.
  Inspect accessories and all cables before use. Pay particular attention to damage, interrupted insulation or kinked cables.
- If the instrument or its accessories don't function flawlessly, permanently remove the instrument/accessories from operation and secure them against inadvertent use.
- If the instrument or accessories are damaged during use, for example if they're dropped, permanently remove the instrument/accessories from operation and secure them against inadvertent use.
- If there are any signs of interior damage to the instrument or accessories (e.g. loose parts in the housing), permanently remove the instrument/accessories from operation and secure them against inadvertent use.
- Devices and accessories from Seaward Electronic Ltd. are designed to work optimally with the Seaward Electronic Ltd. products expressly intended for this purpose. Unless otherwise expressly confirmed in writing by Seaward Electronic Ltd., they are not intended or suitable for use with other products.
- Route cables in an orderly fashion, e.g. the mains power cable and accessories cable. Loose, disorderly cables result in unnecessary danger of tripping and falling.

Measurements/Tests

- The integrated voltage measuring function must only be used as follows:
- European Union:
  The integrated voltage measuring function and mains check of the test/measuring instrument may not be used to test systems or system components for the absence of voltage.
  Testing for the absence of voltage is only permissible with a suitable (2-pole) voltage tester / voltage measuring system which fulfills the requirements specified in EN 61243-3.
- United Kingdom:
  If the instrument is being used to determine the presence or absence of hazardous voltages, always prove the operation of voltage measurement function before and after use by means of a known voltage source or proving unit.
- Always ensure that the circuit or appliance under test is electrically isolated.
- The instrument may apply a test voltage or mains power to the appliance under test. Do not touch the appliance while tests are active.

Operating Conditions

- Do not use the instrument and its accessories after long periods of storage under unfavorable conditions (e.g. humidity, dust or extreme temperature).
- Do not use the instrument and its accessories after extraordinary stressing due to transport.
- Do not expose the instrument to direct sunlight for longer periods of time. Overheating may cause damage to the device.
- Only use the instrument and its accessories within the limits of the specified technical data and conditions (ambient conditions, IP protection code, measuring category etc.).
- Do not use the instrument in potentially explosive atmospheres. Danger of explosion!
- Do not use the instrument in atmospheres subject to fire hazard. Danger of fire!
- Implement adequate measures for protection against electrostatic discharge (ESD).

Instrument-Internal Rechargeable Battery

- Use rechargeable batteries in undamaged condition only. Risk of explosion and fire in the case of damaged rechargeable batteries!
  Inspect the rechargeable batteries before use. Pay particular attention to leaky and damaged rechargeable batteries.
- When using rechargeable batteries, the instrument may only be used with inserted and secured battery compartment lid. Otherwise, dangerous voltages may occur at the rechargeable battery contacts under certain circumstances.
- Only charge undamaged rechargeable batteries. Risk of explosion and fire in the case of damaged rechargeable batteries!
  Inspect the rechargeable batteries before charging. Pay particular attention to leaky and damaged rechargeable batteries.

Fuses

- The instrument may only be used as long as the fuses are in flawless condition. Defective fuses must be replaced.
  Fuses may only be replaced by our repair service department.
- Never bridge the fuses. Never put the fuses out of operation.

Measurement Cables and Establishing Contact

- Plugging in the measurement cables must not necessitate any undue force.
- Never touch conductive ends (for example of test probes).
- Fully unroll all measurement cables before starting a test/measurement. Never perform a test/measurement with the measurement cable rolled up.
- Avoid short circuits due to incorrectly connected measurement cables.

- Ensure that alligator clips, test probes or Kelvin probes make good contact.
- Do not move or remove as far as possible plugs, test probes, alligator clips or Kelvin probes until testing/measurement has been completed.
  Unwanted sparking may otherwise occur due to test current.

Calibration

- Comply with national calibration regulations and laws.
- Calibrations must be carried out by authorized service departments.

Emissions

- The device is equipped with a Bluetooth® module. Make sure that the frequency band from 2400 MHz to 2483.5 MHz may be used in your country.

Data Security

- Always create a backup copy of your measurement/test data.
- The device is equipped with a data memory to which personal and/or sensitive data can be stored. Observe and comply with the applicable national data protection regulations. Use the corresponding functions provided by the test instrument (such as access protection), as well as other appropriate measures to prevent unauthorized access to the data.

2. Application

2.1 Intended Use / Use for Intended Purpose

The instrument is designed for the purpose of performing specific electrical tests on portable appliances.

The instrument can be used to perform the measurements described in this manual.

Safety of the operator, as well as that of the instrument, is only assured when it is used for its intended purpose.

2.2 Use for Other than Intended Purpose

Using the instrument for any purposes other than those described in this manual, or the Quick Start Guide, is contrary to use for intended purpose. Use for other than intended purpose may lead to unpredictable damage!

2.3 Liability and Guarantee

The warranty provided by Seaward Electronic Ltd, and its liability, are governed by the applicable contractual and mandatory statutory provisions.

Register your instrument now

To activate your 2 year warranty please register your product at seaward.com/register

3. Documentation

3.1 Information Concerning these Instructions

Read these instructions carefully and attentively. They contain all necessary information for safe use of the instrument. Comply with them in order to protect yourself and others from injury, and to avoid damaging the instrument.

The latest version of these instructions is available on our website:

https://www.seaward.com/gb/support/

Errors and Suggestions for Improvement

These instructions have been prepared with utmost care in order to ensure correctness and completeness. Unfortunately, errors can never be entirely avoided. Continuous improvement is part of our quality goal, so we always appreciate your comments and suggestions.

Gender Equality

For better readability, only the masculine form is used in these instructions in a grammatically impartial sense. The feminine and diverse forms are of course always implied as well.

Trademark Law

Product designations used in this document may be subject to brand law and patent law. They are of the property of their respective owner.

Copyright

3.2 Identification of Warnings

Instructions for your safety and for the protection of the instrument and its environment are provided as warnings and notes at certain points within these instructions.

They're laid out as shown below and are graded in terms of the severity of the respective hazard. They also describe the nature and cause of the hazard, the consequences of non-observance and what must be done to avoid it.

DANGER

Death or serious injury is almost certain.

WARNING

Death or serious injury is possible.

CAUTION

Minor or moderate injury possible.

ATTENTION

Damage to the product or the environment.

Note

Important information.

Tip

Useful additional information or application tip.

3.3 Identifiers

The following identifiers are used in this documentation:

Identifier	Meaning
Control element	Keys, buttons, menus and other controls
✓ Prerequisite	A condition etc. which must be fulfilled before a given action can be taken
1. Procedural step	Steps of a procedure which must be completed in the specified order
↳ Result	Result of a procedural step
▪ Enumeration ▫ Enumeration	Bullet lists
Footnote	Comment

3.4 Symbols in the Documentation

The following icons are used in this documentation:

Icon	Meaning
	Read and adhere to the product documentation.
	General warning symbol.
	Warning regarding electrical voltage.

3.5 Definition of Terms

Term	Definition
Instrument	Apollo 600+
EUT	Equipment under test, e.g. a device

4. The Instrument

4.1 Scope of Delivery

Please check the scope of delivery for completeness and intactness.

1.	Apollo 600+ instrument	1 ×
2.	Professional carry case	1 ×, not pictured
3.	Test lead 1.2 m with alligator clip, Red	1 ×
4.	Test lead 1.2 m with alligator clip, Black	1 ×
5.	IEC extension lead, 0.5 m	1 ×, not pictured
6.	Mains lead	1 ×, not pictured
7.	USB download lead	1 ×
8.	Apollo Checkbox	1 ×
9.	UKAS calibration certificate	1 ×
10.	Quick Start Guide	1 ×
11.	CE declaration	1 ×, not pictured

4.1.1 Part Numbers

Instrument

Apollo 600+ (with standard content)	M711B
Apollo 600+ Elite Kit (with standard content and Elite Kit consisting of Test n Tag Elite 2, 2D Elite Scanner, 2 × Elite Label Roll (52 × 25 mm), 2 × Elite Label Roll (52 × 74 mm), and Apollo Kit Bag)	M711C

PATGuard 3 Software

PATGuard 3 1-Year-Licence	400A927

Download a 30 day free trial of PATGuard 3 at

https://gmc-i.link/patguard3

4.2 Optional Accessories

Some measurements necessitate optional accessories:

Test n Tag Elite 2 (Bluetooth® printer)	339A9890
Elite Label Roll (52 × 74 mm) (for Test n Tag Elite 2)	339A9501
Elite Label Roll (52 × 25 mm) (for Test n Tag Elite 2)	339A9500
2D Elite Scanner (Bluetooth®)	339A928
16A 3 Phase Leakage Adaptor 5 Star (for R_{PE} & I_{PE})	391A930
32A 3 Phase Leakage Adaptor 5 Star (R_{PE} & I_{PE})	391A931
Apollo+ Series Test Lead Set (red and black)	380A951
Apollo+ Series Battery	380A019
Apollo + Series Kit Bag	71G109

4.3 Device Overview

1. Test Terminals
2. Screen
3. Function Keys F1 - F5
4. QWERTY Keyboard
5. Power Off / Stop Key
6. Power On / Start Key
7. Arrow Keys
8. EUT Socket
9. IEC Inlet
10. Probe Socket 1
11. Mains Inlet / Probe Socket 2
12. USB B Port
13. USB Flash Drive Port
14. Flash
15. Camera
16. Battery Cover

4.4 Symbols on the Instrument and the Included Accessories

Icon	Meaning
	Warning concerning a point of danger (attention, observe documentation!)
CE	European conformity marking
	The instrument may not be disposed of with household trash (see page 78).
	Warning regarding dangerous electrical voltage

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4.5 Relevant Standards

The instrument has been manufactured in accordance with the following safety regulations:

BS EN 61010-1	Safety requirements for electrical equipment for measurement, control, and laboratory use. General requirements
BS EN 61010-2-030	Safety requirements for electrical equipment for measurement, control, and laboratory use - Particular requirements for equipment having testing or measuring circuits
BS EN 61557 parts 1, 2, 4 and 10	Electrical safety in low voltage distribution systems up to 1000 V AC and 1500 V DC - Equipment for testing, measuring or monitoring of protective measures. Resistance of earth connection and equipotential bonding

4.6 Technical Data

General

Dimensions W × H × L	150 × 100 × 230 mm
Weight	1.5 kg
Internal memory	Up to 50,000 records and 2,000 photos
Protective system	IP40 according to IEC 60529
Power supply	Mains or rechargeable battery pack

Environmental Conditions

Pollution degree	2 according to IEC 60529
Operating temperature	0 °C ... 40 °C
Operating relative humidity	30 % ... 50 %, without moisture condensation, not intended for use in wet environment
Operating altitude	0 m ... 2000 m
Ambient conditions	Indoor use

Electromagnetic compatibility (EMC)

Interference immunity and emitted interference conforming to IEC 61326-1

Wi-Fi and Bluetooth® dual-mode (BR/EDR and low energy)

Parameter	Wi-Fi	Bluetooth® (BR/EDR)	Bluetooth® (Low Energy)
Frequency band of operation	2.400 GHz ... 2.4835 GHz		
Supported modes	802.11 b/g/n	Bluetooth® v4.2 + EDR	Bluetooth® v4.2
Typical radiated output (transmit) power	18 dBm EIRP	8 dBm EIRP	8 dBm EIRP
Maximum radiated output (transmit) power	<20 dBm EIRP	<10 dBm EIRP	<10 dBm EIRP
Radio spectrum efficiency (article 3.2)	ETSI EN 300 328 V2.2.2		
Usage	Transfer of test data	Connection to peripherals such as scanners and printers	

4.7 Electrical Specification

Earth Continuity (R_{PE})

Output current (load 2 Ω):	±200 mA_{DC} with Zap circuit technology (low current testing with high intensity pulses)
Test voltage (o/c):	4 V_{DC}
Display range:	0.01 Ω ... 19.99 Ω
Measurement range	0.05 Ω ... 19.99 Ω
Resolution:	0.01 Ω
Operating error:	±5 % + 4 counts
Number of tests as per IEC 61557-4:	Approx. 1,500 (battery pack operation)

Insulation Test (I_R)

Test voltages:	500 V and 250 V_{DC} at 1 mA nominal
Test current:	1 mA minimum for a load of 1 kΩ/volt, <2 mA into s/c
Test voltage accuracy:	+20 %, –0 %
Display range:	0.00 MΩ ... 19.99 MΩ
Measurement range:	0.10 MΩ ... 19.99 MΩ
Resolution:	0.01 MΩ
Operating Error:	±5 % +5 counts (0.10 MΩ ... 9.99 MΩ) ±10 % +5 counts (10.00 MΩ ... 19.99 MΩ)
Pass Value:	User defined
Number of tests as per IEC 61557-2:	Approx. 1,500. (battery pack operation)

IEC Lead Test

Test Voltage:	5 V_{DC} nominal
Test:	Live/neutral checks for o/c, s/c

Protective Conductor Current/Load (Class 1)

Measurement method	Differential leakage current
Test voltage:	Supply voltage, maximum load current 16 A
Display range:	0.01 mA ... 19.99 mA
Measurement range:	0.25 mA ... 19.99 mA
Resolution:	0.01 mA
Operating error:	±5 % of reading ±3 digits
Pass value:	User defined
Frequency response:	40 Hz ... 2.5 kHz

Touch Current (Class 2)

Measurement method	Direct leakage current
Test voltage:	Supply Voltage, maximum load current 16 A
Display range:	0.00 mA ... 3.5 mA
Measurement range:	0.10 mA ... 3.5 mA
Resolution:	0.01 mA
Operating error:	±5 % of reading ±2 digits
Pass value:	User defined
Frequency response:	DC to 2.5 kHz

Load Power/Current

Test voltage:	Supply Voltage, maximum load current 16 A
Test duration:	Programmable up to a maximum of 240 s
Display range:	0.00 ... 16.00 A (0.00 kVA ... 4.00 kVA)
Measurement range:	0.50 ... 16.00 A (0.50 kVA ... 4.00 kVA)
Resolution:	0.01 A
Operating error:	±10 % of reading ±5 digits

Substitute (Alternative) Leakage Current

Test voltages:	>25 V_{AC} <50 V_{AC}
Display range:	0.00 mA ... 19.99 mA
Measurement range:	0.20 mA ... 19.99 mA
Resolution:	0.01 mA
Operating error:	±10 % +2 digits
Pass value:	User defined

PRCD Test

Test method:	Internal isolation to avoid tripping distribution board RCD
Test voltage:	230 V +10 %, –15 %
Test current:	30 mA / 150 mA rms sinusoidal
Test current accuracy:	30 mA –10 % +0 %, 150 mA +10, –0 %
Display range:	0 ms ... 2000 ms
Measurement range:	1 ms ... 2000 ms
Resolution:	1 ms
Operating error:	±1 ms

Power Socket Test

Input voltage range:	195 V ... 264 V_{AC}
Indicates configuration of voltage potential:	Line potential phase to neutral

External Leakage

Test Voltage:	Connected to external adapter
Display Range:	0 mA ... 9.00 mA
Measurement Range:	0.25 mA ... 9.00 mA
Resolution:	0.01 mA
Operating Error:	±5 % of reading +-2 digits

5. Start Up

5.1 Before Using Your Instrument for the First Time

Before using your Instrument for the first time, please ensure that you fully charge the instrument using the black power lead plugged into the mains inlet.

Note

Please ensure the batteries are fully charged before first use.

5.2 Downloading PATGuard 3 Software

1. To download the PATGuard 3, go to https://gmc-i.link/patguard3.
2. Once you have downloaded PATGuard 3, double-click the downloaded file to install PATGuard 3 on your system.

3. Click **Next** to start the installation process.
4. Follow the instructions of the setup wizard.

↳ The software is installed.

6. Powering the Instrument

6.1 Turning ON / OFF

Switch on the instrument by pressing and holding, the green **ON/START** key. After 2–3 seconds the instrument will beep and the display will show a **boot up screen**.

This is the Power **ON** button.

This is the Power **OFF** button.

6.2 Instrument Battery Status Indication

While the instrument is powered on there are periodic checks of the batteries. The instrument will show the status of the batteries.

Note

The battery symbols are not displayed in real time and may take a few minutes to update.

This symbol indicates that the batteries are at 100% capacity.

There are several symbols which will display the current battery voltage. When these icons are displayed the batteries are still good.

This symbol indicates that the batteries are low. Although tests performed with the batteries in this state are still valid, all test types may not complete their intended duration. The batteries should be recharged.

This symbol indicates that the batteries are discharged. The instrument will switch itself off after a short period of time. The batteries must be recharged.

This symbol indicates that the instrument is bulk charging batteries at the full charge current.

This symbol indicates that the instrument is trickle charging the batteries with reduced charge current. This is known as the top up charge.

This symbol indicates that the instrument has detected a fault with the battery or battery charger circuit. Unplug the instrument from the mains supply and wait 2 minutes before reconnecting the mains. If the fault persists then return the instrument for service.

6.3 Charging the Battery Pack

The battery pack will be charged whenever the instrument is connected to the mains supply regardless of whether the instrument is switched ON or OFF.

The typical charging current is set to 500 mA but this may vary as the instrument also includes precharge and top up charge modes.

When no tests are being performed the battery pack should be fully recharged after 7 hours.

6.4 Replacing the Battery Pack

WARNING

Risk of electric shock
Before opening the instrument battery compartment ensure that all test leads and accessories are disconnected.

ATTENTION

Product damage due to the use of an unsuitable battery
Only use a replacement battery pack that has been supplied by Seaward Electronic Ltd or a Seaward Electronic Ltd approved distributor.

1. Power off the instrument.
2. Disconnect all test leads and accessories.
3. Position the instrument face down and remove the screw holding the battery compartment cover in place.
4. Remove the battery compartment cover.
5. Remove the battery pack from the compartment and unplug the multiway connector.
6. Connect the multiway connector of the new battery to the connector in the battery compartment; place the new battery pack into the compartment.
7. Relocate the battery compartment cover and fasten in position with the battery compartment screw.

7. Getting To Know the User Interface

1 Information bar – This area of the screen shows the date, time, current user, battery status and connection status.

2 Test sequence table – This area is only displayed in test mode showing the tests within the selected test sequence. This will also display the results and status of the results that have been performed. Generally, in manual mode, this table will only show one test.

3 Test details – This area is only displayed in test mode showing the details specific to the active test. This includes the measurement, an analogue measurement graph, the duration and limit. Some tests may show more than one measurement.

4 Main area – This area is used to display menu items, text fields or forms.

5 Function key icons – This area of the screen is used to identify the current action assigned to each function key (F1 to F5).

8. User Options (PAT Settings)

PAT settings is used to setup standard user preferences, such as the options after each test.

User options can be accessed from the **Home Screen**  by selecting PAT (F1) for the **Portable Appliance Testing** window.

In the **Portable Appliance Testing** window select the **Tools** function  (F4) to enter the **User Options** / **PAT Settings** window.

The **User Options** or **PAT Settings** window consists of 3 pages and the function keys on these pages correspond to the following:

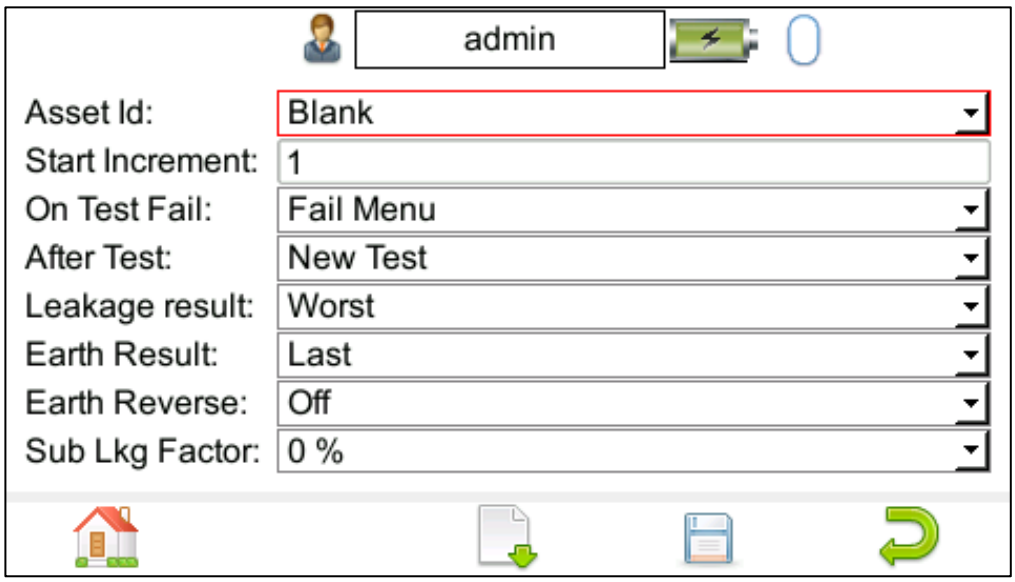
Use F1 to return to the **Home Screen**, without saving.

Use F3 to go to the next **User Options** / **PAT Settings** page.

Use F4 to save changes and return to the **Portable Appliance Testing** menu.

Use F5 to return to the **Portable Appliance Testing** menu, without saving.

8.1 User Options / PAT Settings – Options Page 1



Asset ID:

Blank / Repeat Last / Increment

This can be set to present a blank field, repeat the last Asset ID or automatically increment the Asset ID number for each successive test.

Start Increment:

This field is used to set the starting point for the auto increment feature. The value entered can be numeric or alpha-numeric ending with a numerical value.

If you want data to display in the correct numerical order in PATGuard 3 then, for example, use “0001” instead of “1”.

On Test Fail:

End Test / Fail Menu

In the event of a test failure during an automatic sequence, the instrument can be configured to either End Test, which will terminate the test sequence or present a Fail Menu, which will provide the following list of options:

- **Restart Test**
- **Skip Test**
- **Restart Test Sequence**
- **Abort Test Sequence (Don’t Save Results)**
- **End Test Sequence (Save Results)**

Restart Test is useful for coping with situations such as forgetting to connect the earth continuity probe.

End Test Sequence will record a Fail result whereas Abort Test Sequence does not record a result.

After Test:

New Test / Print Label / Print Results / Options Menu

There is a choice of 4 actions to be carried out at the end of a test sequence.

New Test will allow data to be saved at the end of a test using  (F4) and then open the Asset Details window ready for a new test.

Print Label will allow data to be saved at the end of a test using  (F4) and then open the **Print Label** window. When printing is complete, the tester will stay in the **Print Label** window until printing is complete or you can return to the **Test Details** window using  (F5), ready to start the next appliance.

Print Results will display the **Print Test Results** menu, selecting **Print** (F4) will send this to a connected printer or you can return to the **Test Details** window using  (F5), ready to start the next appliance.

Options Menu will allow data to be saved at the end of a test using  (F4) and then open the **Test Details** window. Pressing  (F4) will proceed to the **Test Result Options** window with a list of addition options:

- View Test Results
- View Test Sequence
- Information
- Print Test Results
- Print Label

The **Up / Down** keyboard arrows keys, on the keyboard, can be used to highlight an option which can be selected using  (F4) or you can return to the **Test Details** window using  (F5), ready to start the next appliance.

Leakage Result:

Last / Worst

This field can set to **Last** where the last reading taken during the measurement period is compared with the pass/fail limit or **Worst** where the highest reading taken during the measurement period is compared with the pass/fail limit.

Setting the field to **Worst** will cause the leakage result to fail if the reading exceeds the limit value at any point during the measurement period.

Earth Result:

Last / Worst

This field can set to **Last** where the last reading taken during the measurement period is compared with the pass/fail limit or **Worst** where the highest reading taken during the measurement period is compared with the pass/fail limit.

Setting the field to **Worst** will cause the earth continuity test to fail if the reading exceeds the limit value at any point during the measurement period, for example if there is a momentary break in the protective conductor when the mains cable is flexed.

Earth Reverse:

Off / On

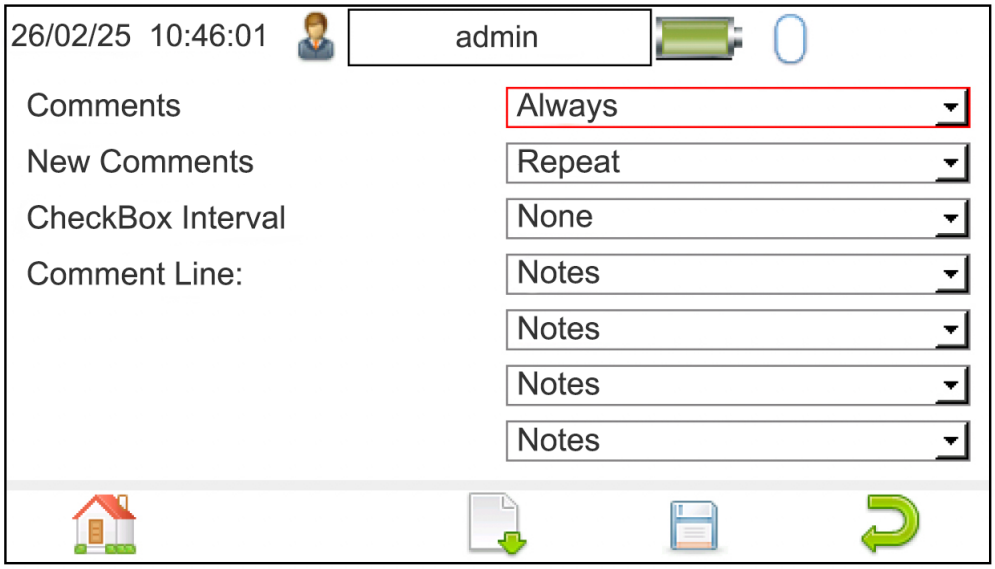
This field is used to enable or disable automatic reversal of the earth continuity test current polarity. **Off** sets the earth continuity test current to +200 mA and **On** sets the earth continuity test current to +200 mA followed by –200 mA.

Sub Lkg Factor:

0 % / 6 % / 10 %

This field is used to set the substitute (alternative) leakage scale factor to 0%, 6% or 10%. The substitute (alternative) leakage reading is then calculated for 230 V (0%), 244 V (6%) or 253 V (10%).

8.2 User Options / PAT Settings – Options Page 2



Comments:

Always / On Pass / On Fail / Never

Can be set to open the comment window: **Always** (after every test sequence), if the test result is a **Pass**, if the test result is a **Fail** or **Never**.

New Comments:

Clear / Same as Last

This field can be set to **Clear** where previous comments are removed from the comments fields or **Same as Last** where the previous remain in the comments fields. This can be useful when performing repeated tests on the same type of appliance.

Checkbox Interval:

None / Daily / Weekly / Monthly

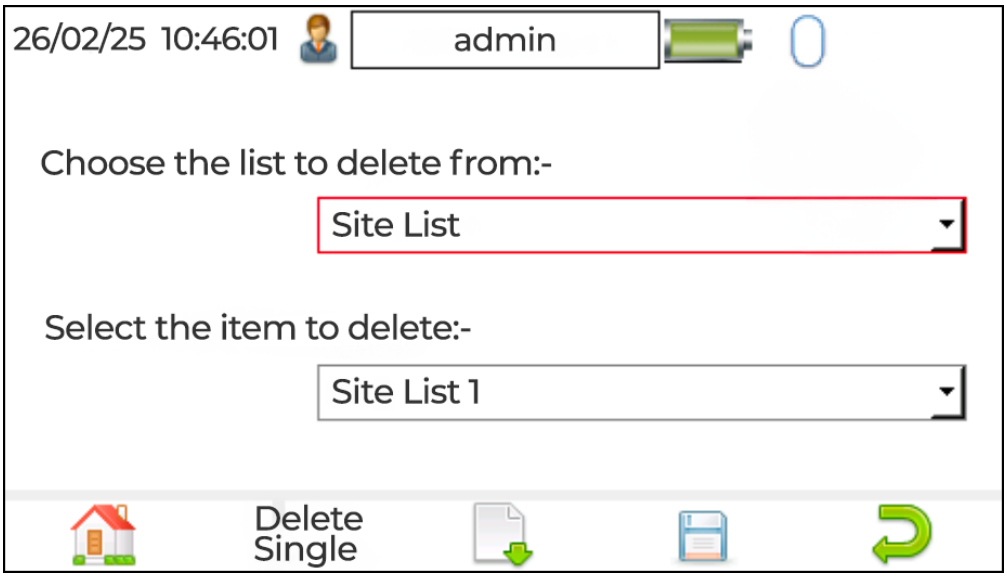
This field is used to set the frequency of the checkbox reminder to **None**, **Daily**, **Weekly** or **Monthly**.

Comments Line:

Notes / Asset Description / Asset Group / Make / Model / Serial Number / Location / Code / Asset Description (fixed) / Notes (large field) / RFID Data

This allows the field descriptor for each of the four comment lines (text lines) to be changed to show: **Notes, Asset Description, Asset Group, Make, Model, Serial Number, Location, Code, Asset Description (fixed), Notes (large field)** or **RFID Data** as required (note this also needs to be setup in PATGuard 3).

8.3 User Options / PAT Settings – Options Page 3



Page 3 of the **PAT Settings** options allows items to be deleted from various lists that exist on the instrument.

Choose the list to delete from:

Site List / Location List / Comments: Description / Comments: Make / Comments: Model / Comments: Asset Group / Comments: Manufacturer / Custom Test: Test Name / Custom Test: Test Units / Custom Test: Test Results

The keyboard arrow keys, on the instrument, can be used to highlight the list to be deleted, for example **Site List**

Select the item to delete:

With the correct list highlighted, the item on the list to be deleted can also be highlighted.

To delete the item selected use **Delete Single** (F2), a warning message is displayed confirming the list and item to be deleted.

Note

Default items can be deleted, however, if all items have been deleted the list will revert back to the original default, for example **Site**.

9. Setting Up Your Instrument

9.1 Main Menu Navigation

The **Main Menu** window can be accessed from the **Home Screen**  by selecting  (F4).

There are 8 available options in the **Main Menu** window. The functions keys in the **Main Menu** window correspond to the following:

 Use **F1** to return to the **Home Screen**.

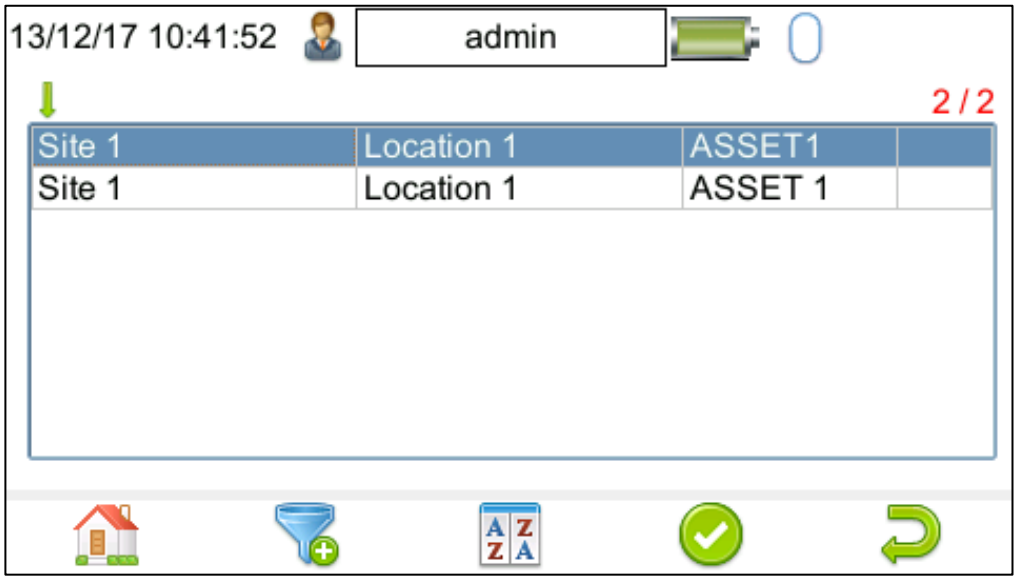
 Use **F4** to accept / select a highlighted option (highlighted using the keyboard arrow keys).

 Use **F5** to display support information / firmware version and calibration details.

In addition to using the keyboard arrows keys to highlight an option (and select using **F4**) options can be selected by pressing the corresponding number on the keyboard. For example, select **1** for **View Data**.

9.2 Main Menu Window – View Data

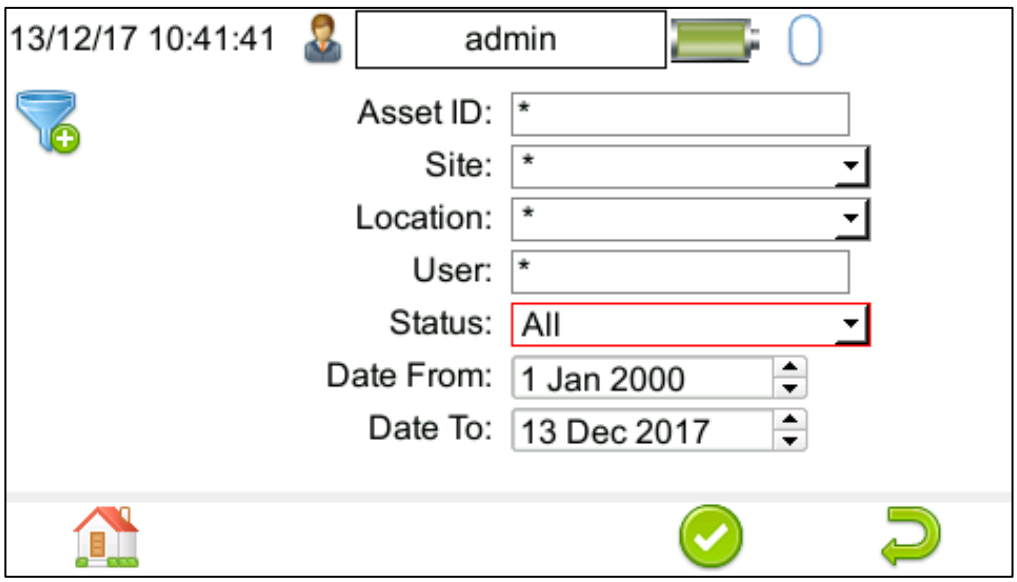
By selecting **View Data** (1) in the **Main Menu**, you can view any data that you have saved in the instrument by **Site**, **Location** or **Asset ID**.



The functions keys in the **View Data** window correspond to the following:

Use **F1** to return to the **Home Screen**.

Use **F2** to filter records to give a customised view.

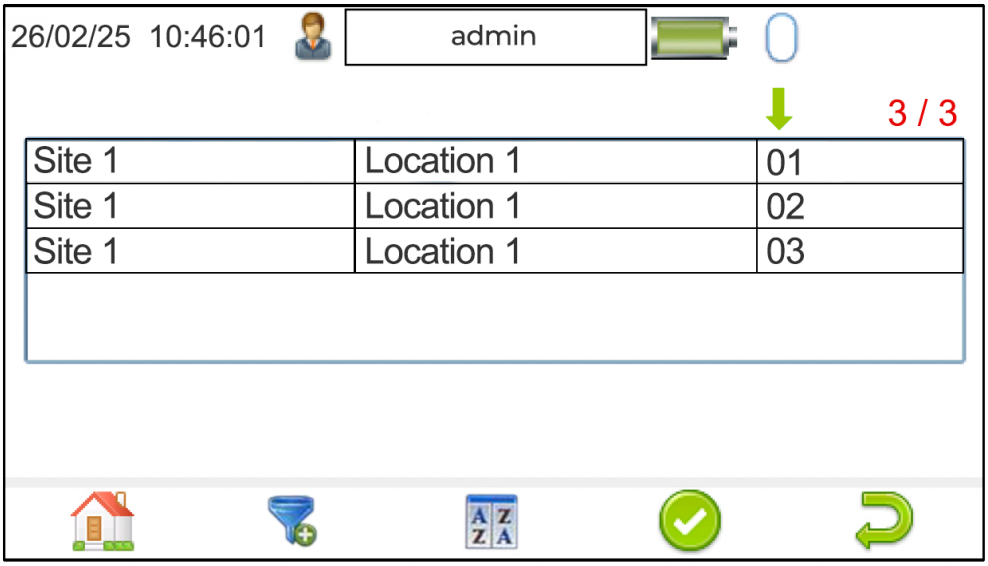


Select the filters you wish to apply, using the keyboard arrow keys on the keyboard, and use

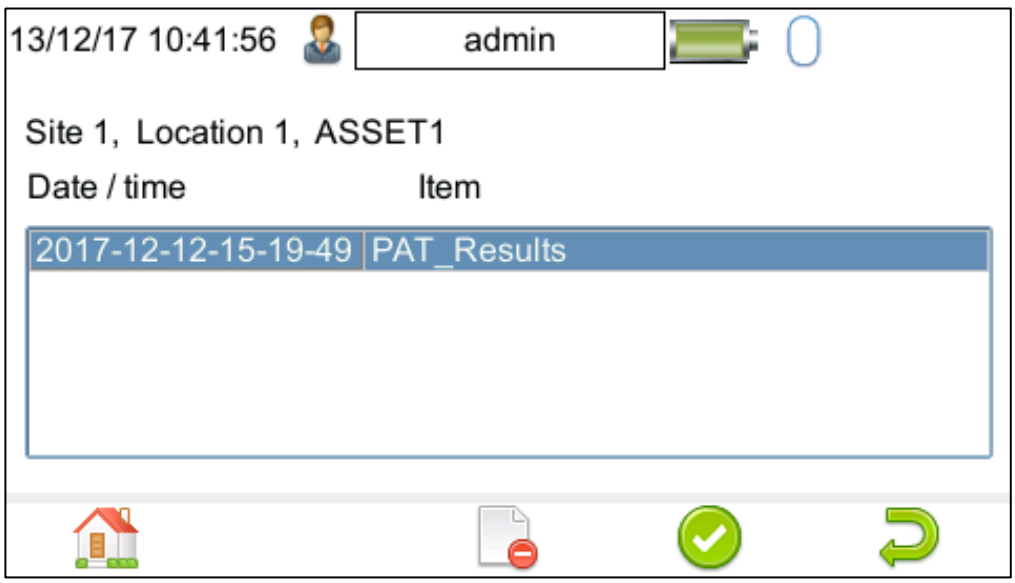
(**F4**) to accept or

(**F5**) to cancel / return.

Use **F3** to sort the records by **Site**, **Location** or **Asset ID** and give a customised view. If the **left** or **right** keyboard arrow keys are selected, in this window, the display will jump **up** or **down** to the next page, respectively.

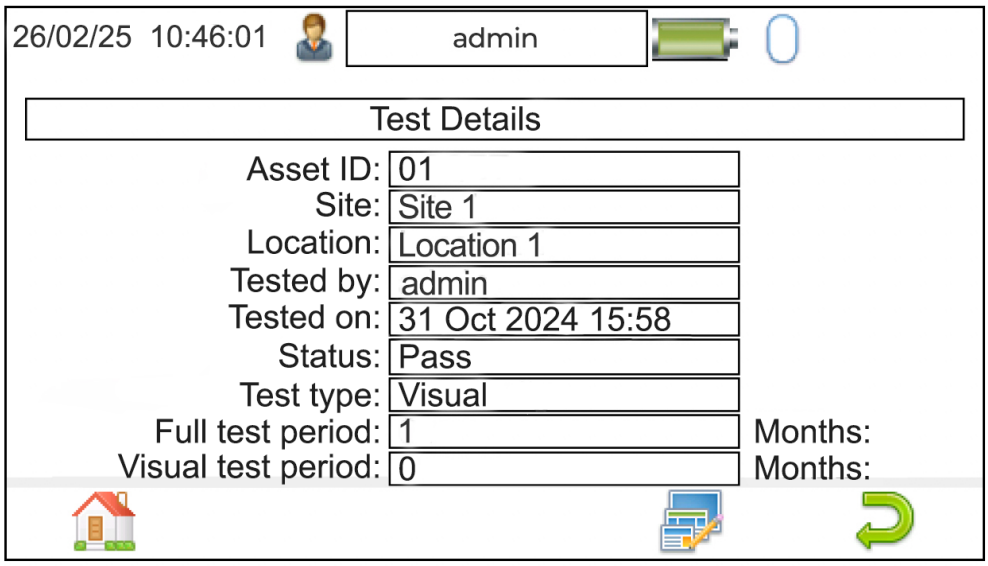


This is the **Accept** function, use the keyboard arrow keys to highlight an asset and use **F4** view any corresponding results.



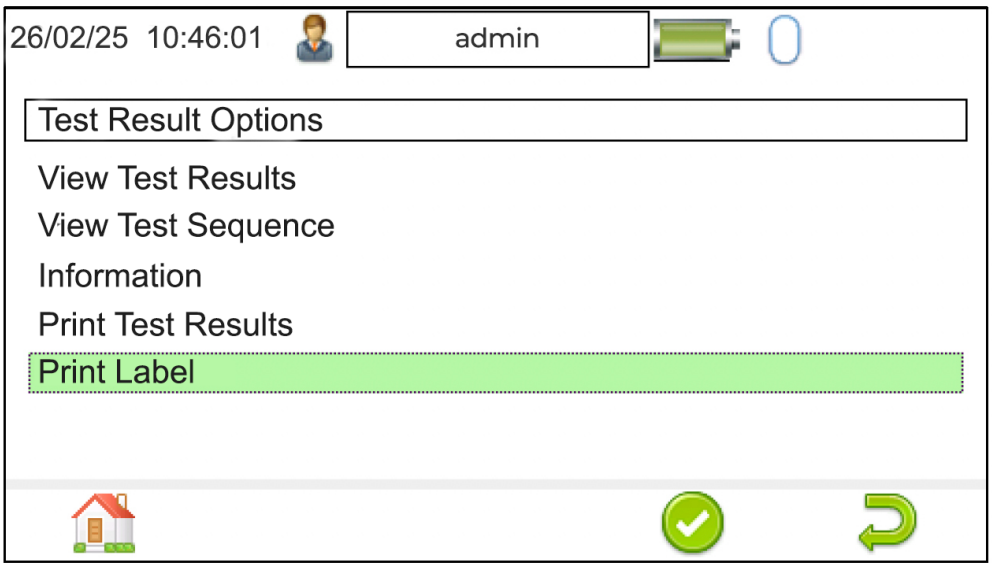
Once in the asset / record you will be given a list of items under that record such as PAT results and JPEG images, depending on what results have been saved against that asset.

Press (**F4**), again to open an item. Alternatively, individual items can be deleted using (**F3**).



When viewing a PAT results record, use the **Menu** icon  (**F4**) to access the **Test Results Options** window. In here you will be able to select one of the following:

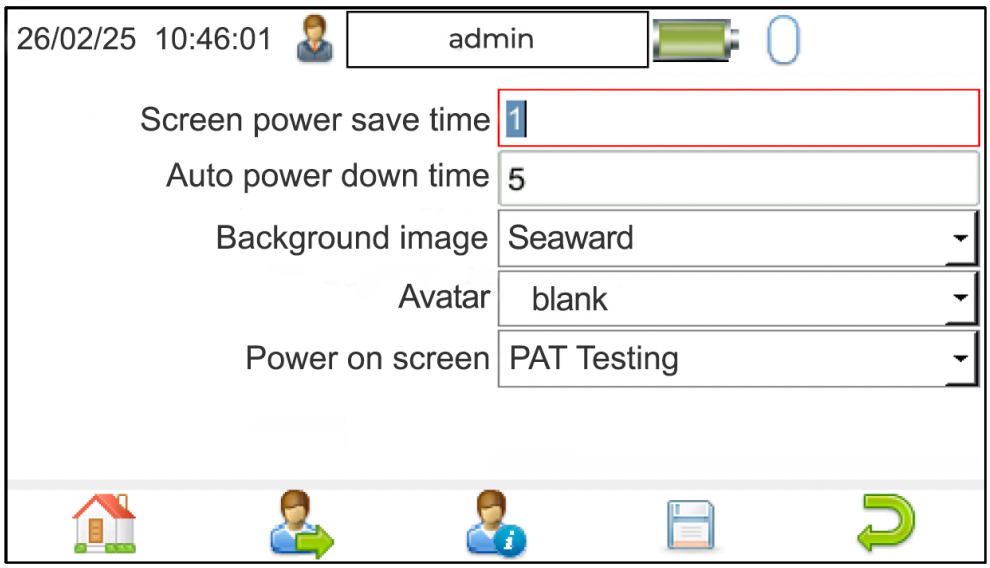
- **View Test Results**displays the test results on the screen
- **View Test Sequence**displays the **Test Sequence** used
- **Information**displays the information in the **Comment Line(s)**
- **Print Test Results**allows the results to be printed as a list
- **Print Label** allows the printer to be set up and a label printed



 Use **F5** to return to the **Main Menu**.

9.3 Main Menu Window – User Setup

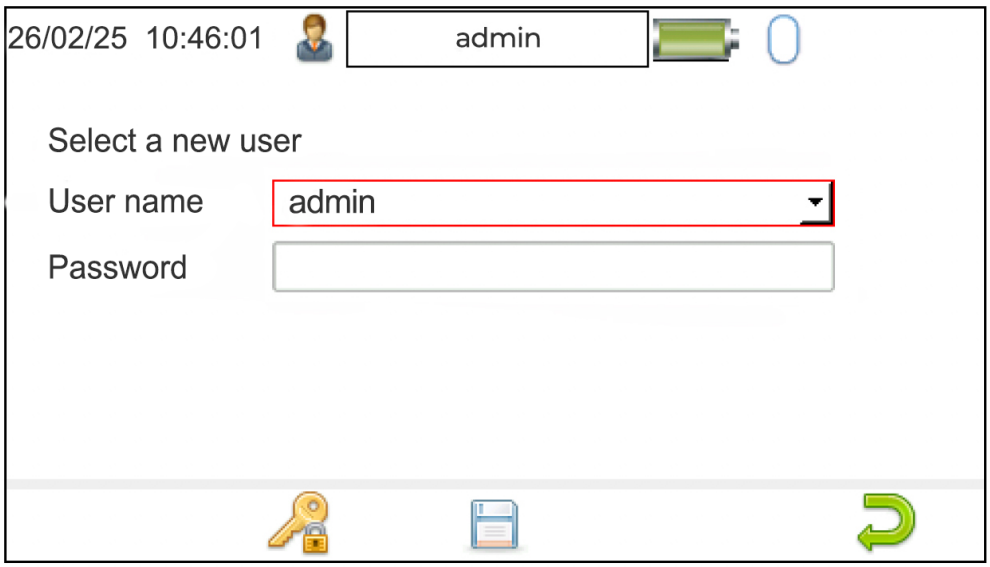
 By selecting **Users** (2), in the **Main Menu**, you can setup new, edit and delete user accounts. Users can alter their own screen power save time, auto power down, background image, avatar (default is blank) and power on screen.



The functions keys in the Users window correspond to the following:

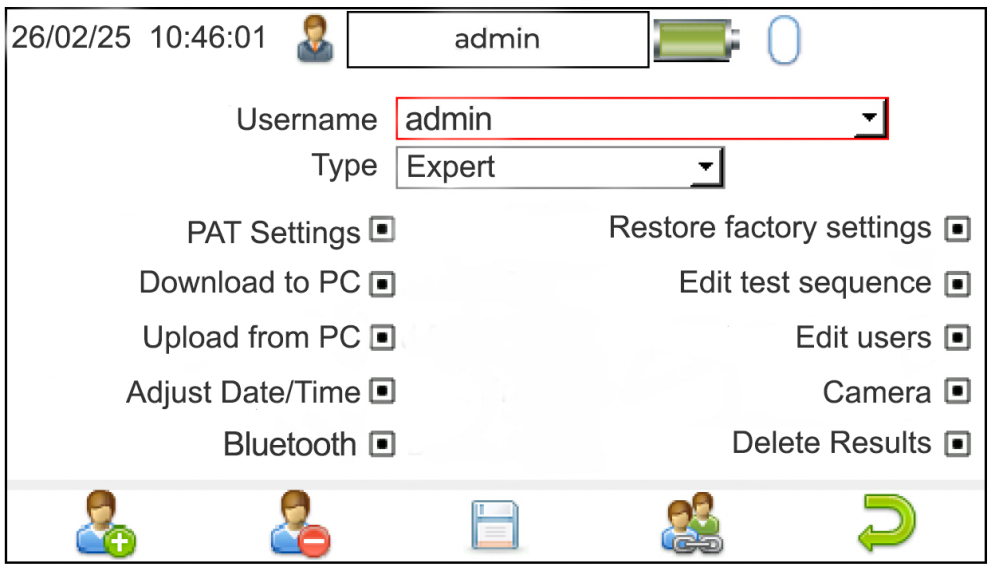
 Use F1 to return to the **Home** screen.

 Use this button (F2) to **Select a new user**. Select the **User name**, from the dropdown and enter the correct **Password** to change the current user of the tester.



 Use this button (**F2** in the **Select a new user** window) to change the password for the current user. Enter the **Existing Password**, enter a **New Password** and then **Confirm New Password**.

Use **F3** to enter the user privileges menu, this allows users to view their current privileges. Users with the correct privileges will also be able to edit their own and other user's privileges by selecting the user they wish to edit from the dropdown.



This is the **New User** button (**F1** in **User Privileges** menu). A **New User** can be setup by adding a **Username** and **Password** and selecting **Save** (**F3**). The **New User** can then be selected in the **Username** field of the **User Privileges** screen. Select the **Type** of user (**Expert** or **Novice**), privileges can be setup by using the **Enter** key to check or uncheck, if a privilege is checked, the user has access to that feature or function. To block a feature or function, for example adjusting the time and date, uncheck that function before saving (**F3**).

Note

Items not selected, left unchecked, for example adjusting the time and date, will be greyed out in certain menus of the instrument.

This is the **Delete User** button (**F2**). It will delete whichever **User** is currently selected in the **Username** dropdown.

Note

The admin user cannot be fully deleted.

Press this button (**F3**) to **Save** changes and return to the previous screen.

This is the **Copy User** function (**F4**). This will copy the settings and preferences of the current user to a new user account.

Use **F5** to return to the **Users** menu.

9.4 Main Menu Window – Setting Up Wi-Fi

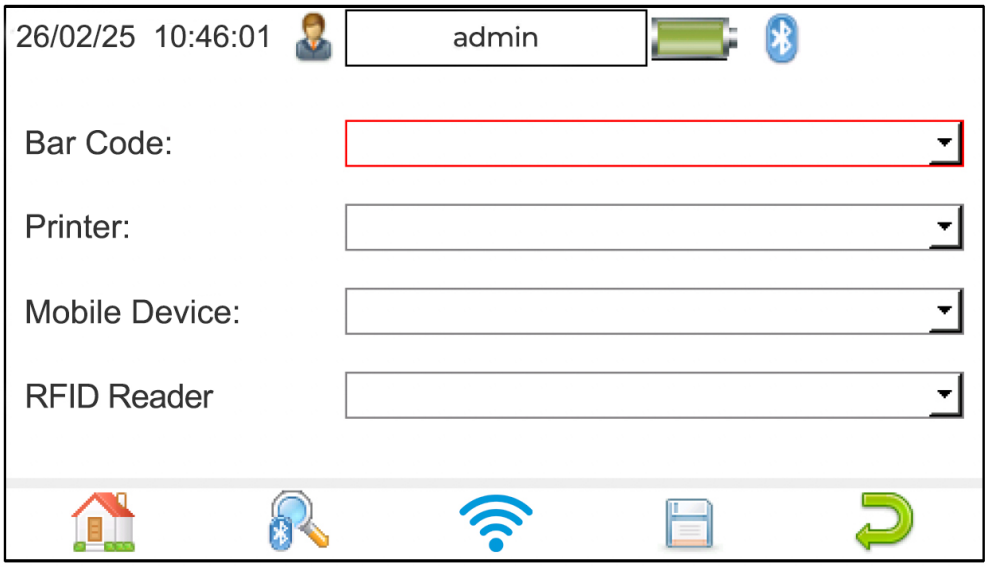
By default, your instrument is configured with the following Wi-Fi details:

SSID: Apollo
(This is the display name shown when performing a Wi-Fi search.)

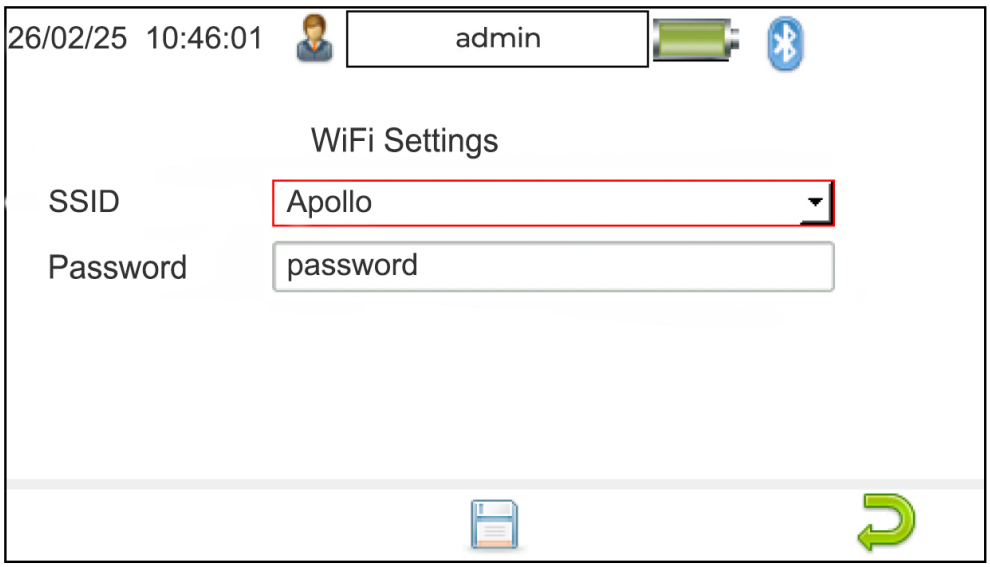
Password: password
(This is the password requested on your device when attempting to connect to the instrument.)

If desired, it is possible to change both the SSID and Password to that of your choice.

From the **Home** Screen press (**F4**) select **Connectivity** (3) to enter the connectivity menu.



Press the **Wi-Fi** button (**F3**) to enter the **Wi-Fi Settings** screen.



Use the directional arrows to select the field to be edited (highlighted in red) and use the keyboard to enter desired details.

Once complete press the **Save** button (**F3**) to store new SSID and password.

9.5 Main Menu Window – Connecting Bluetooth® Devices

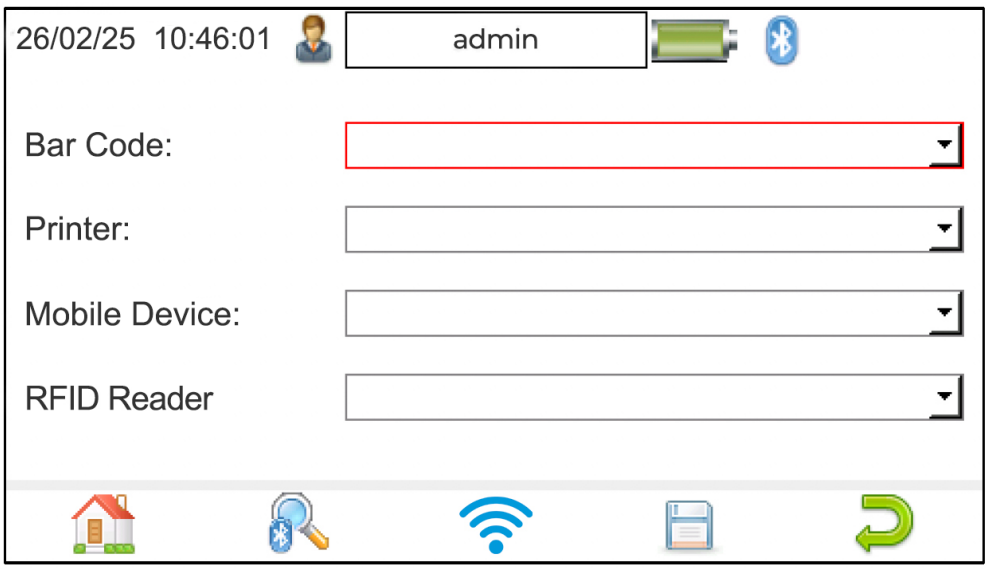
 Select this icon (3) to setup your Bluetooth® accessories to work with the instrument. The instrument can be connected to Bluetooth® accessories including scanners and printers.

Note

This chapter describes the **Bluetooth®** menu in general.
To set up your accessory, see its product documentation.

Menu

The functions keys in the Bluetooth® window correspond to the following:



 The **Bluetooth® Search** button (**F2**) will search the area for Bluetooth® discoverable devices (= Bluetooth® is turned on) and return to the previous menu. You can then use the keyboard arrow keys to select the correct Bluetooth® ID from the dropdowns:

- Select **Bar Code** field and choose your scanner from the list using the keyboard arrow keys.
- Select **Printer** field and choose your printer from the list using the keyboard arrow keys.

 Press this button (F4) to **Save** changes and return to the **Main Menu**.

 Use **F1** to return to the **Home** screen in case you want to return without any changes.

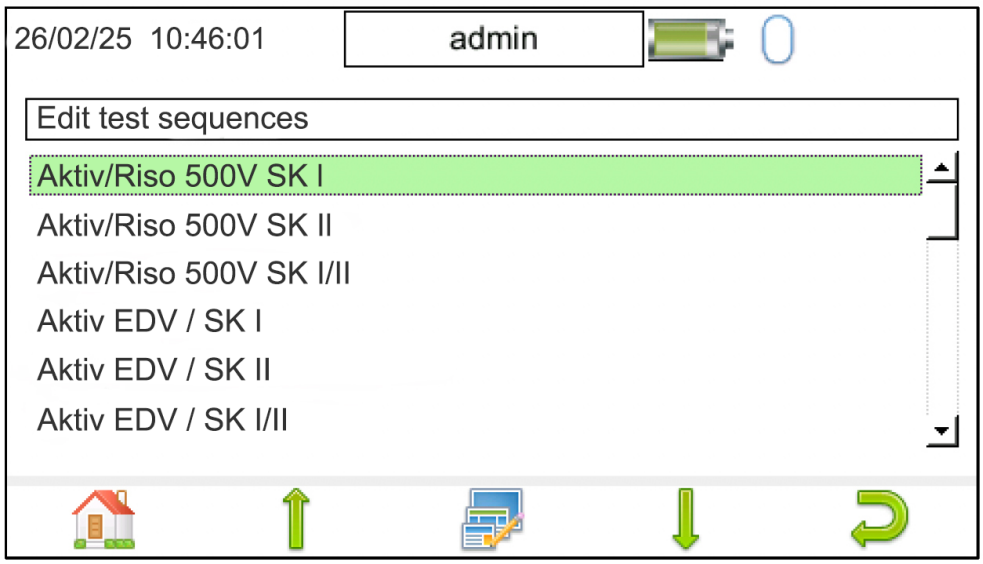
Note

Mobile Device and **RFID Reader** are for future use – do not connect.

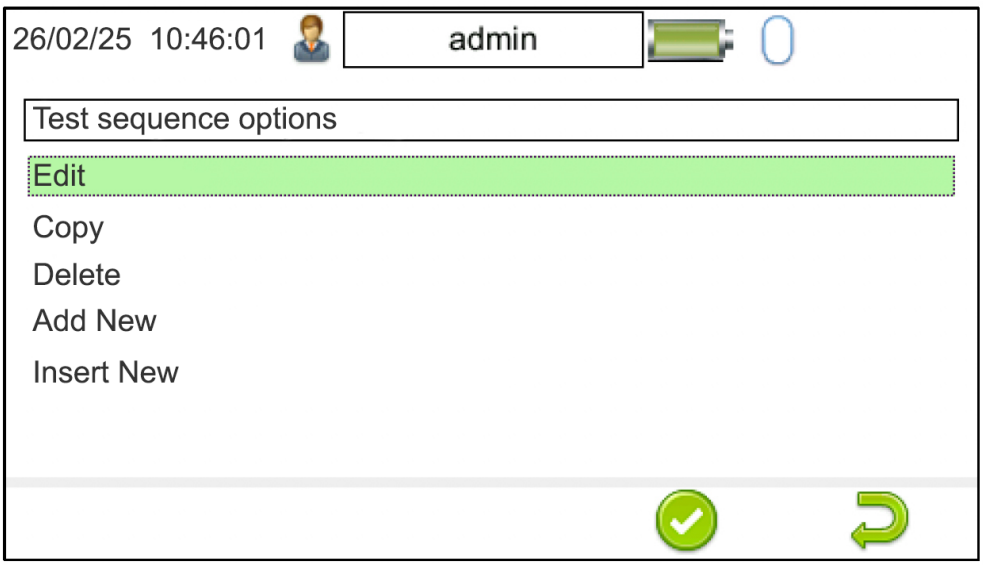
9.6 Main Menu Window – Automatic Test Sequence Editor (PAT Edit)

Although the instrument comes with 25 pre-defined **Test Sequences**, you can modify existing or create new test sequences of your own. You can add another 75 custom sequences.

By selecting **PAT Edit** (4), in the **Main Menu**, you can setup new, edit and delete test sequences. This shows a list of all current test sequences.



Altering **Test Sequences**: with a sequence highlighted, press the menu button (**F3**) to open the **Test Sequence Options** menu.



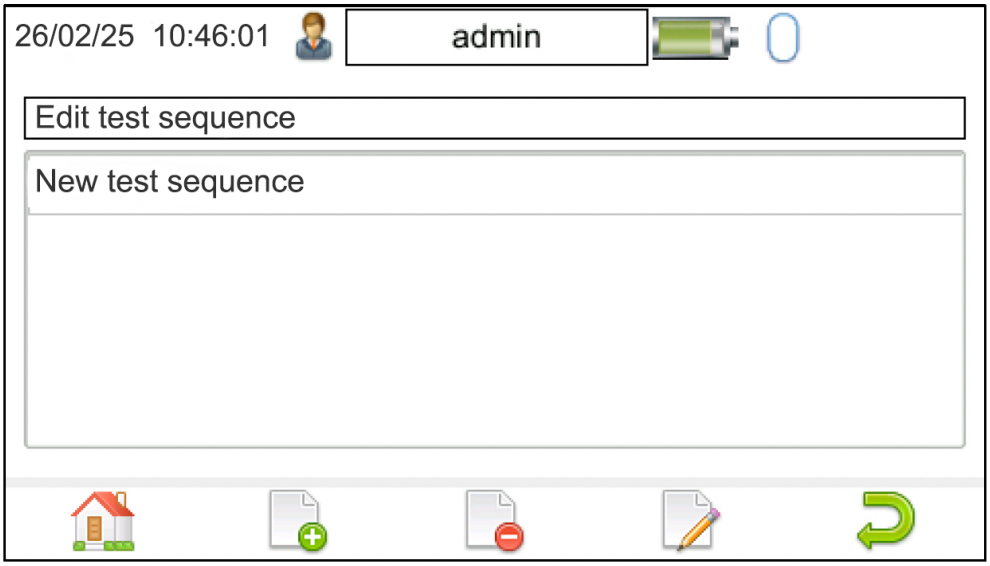
Select **Add New** using the keyboard arrow keys and the **Accept** button (**F4**). This will add a **New Test Sequence** to the bottom of the test sequence list.

With the **New Test Sequence** highlighted press the menu button (**F3**) to open the **Test Sequence Options** menu:

- **Edit** edits the highlighted sequence.

- **Copy** makes a copy of the highlighted test sequence.
- **Delete** deletes the highlighted test sequence.
- **Add New** adds a new test sequence to the bottom of the list.
- **Insert New** adds a new test below the highlighted test sequence.

Select **Edit** using the keyboard arrow keys and the **Accept** button (**F4**). This will open the test sequence for editing.



Add Test function (**F2**). This will add a new test directly under the currently selected test.

Delete Test function (**F3**). This will delete the highlighted test from the test sequence.

Edit Test function (**F4**). This will edit the highlighted test.

Use **F5** this to return to the previous window without saving.

To edit the name of the sequence press the **Edit** button (**F4**). You can then give it a relevant name and press the save button to store (**F4**).

Press the **Add Test** button (**F2**) to add a test or inspection to the sequence. Use the keyboard arrow keys to select which test or inspection you would like to add from the list and the pass/fail limits or select the user test option and confirm using the button (**F4**).

Note

If you select the **Custom User Test** option, you will then need to give it a name from the dropdown or by free typing into the box. You can then add the units of what you would like to record if relevant and press the save button (**F4**) to store

Repeat until you have added all the required steps.

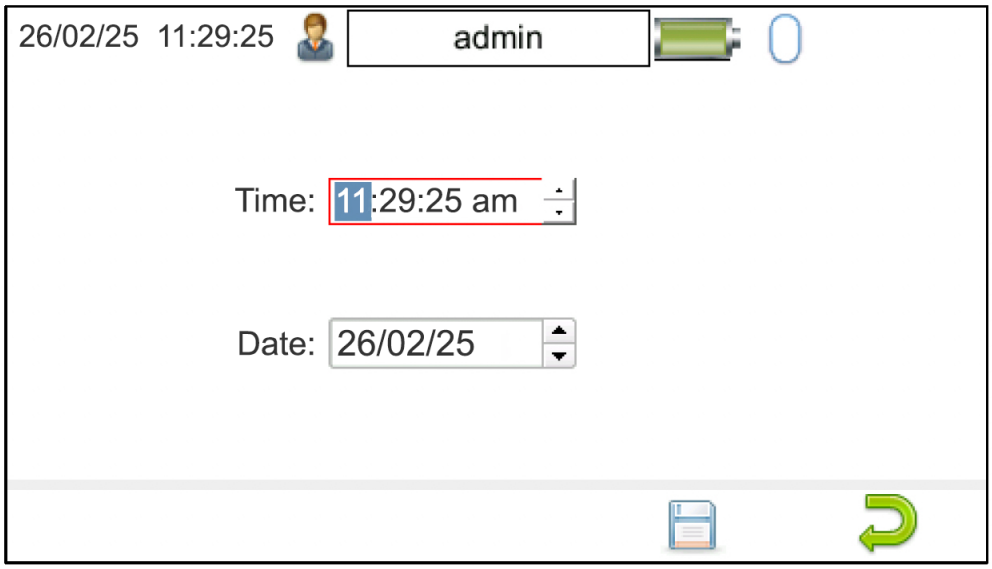
Once complete press the **Back** button (**F5**) and then select **Yes** by pressing the **Y** key when asked if you want to save changes.

The newly created **Test Sequence** can be moved up or down using the function keys (**F2**) or down (**F4**).

Return to the **Home** screen (**F1**). Select (**F1**) and then Auto test (**F2**), your new **Test Sequence** will be available from the dropdown list.

9.7 Main Menu Window – Time and Date Setup

By selecting **Time Date** (6), in the **Main Menu**, you can update the time and date stored on the instrument.

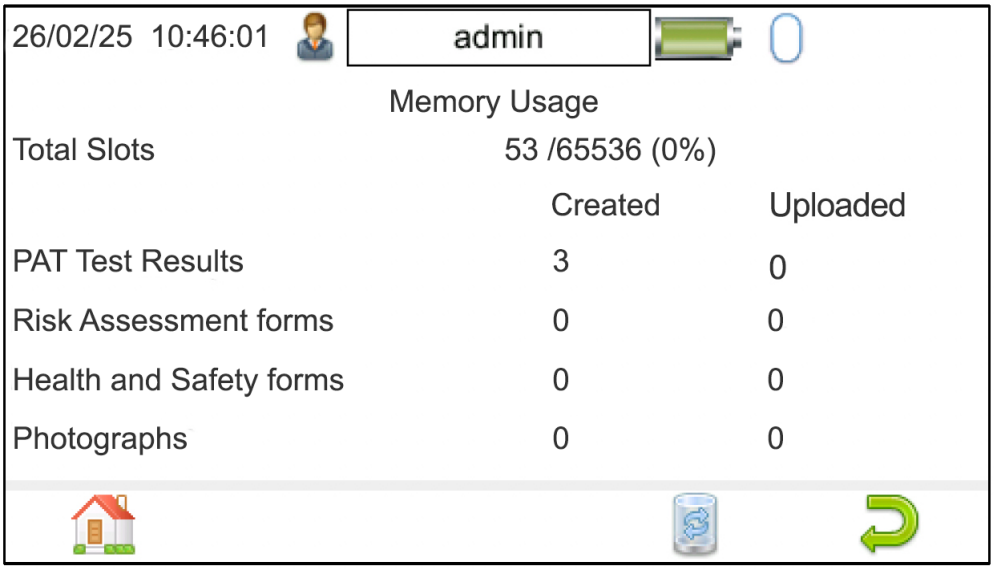


Use the left/right keyboard arrow keys to highlight the required parameter and then use the up/down keyboard keys to increase or decrease this, respectively.

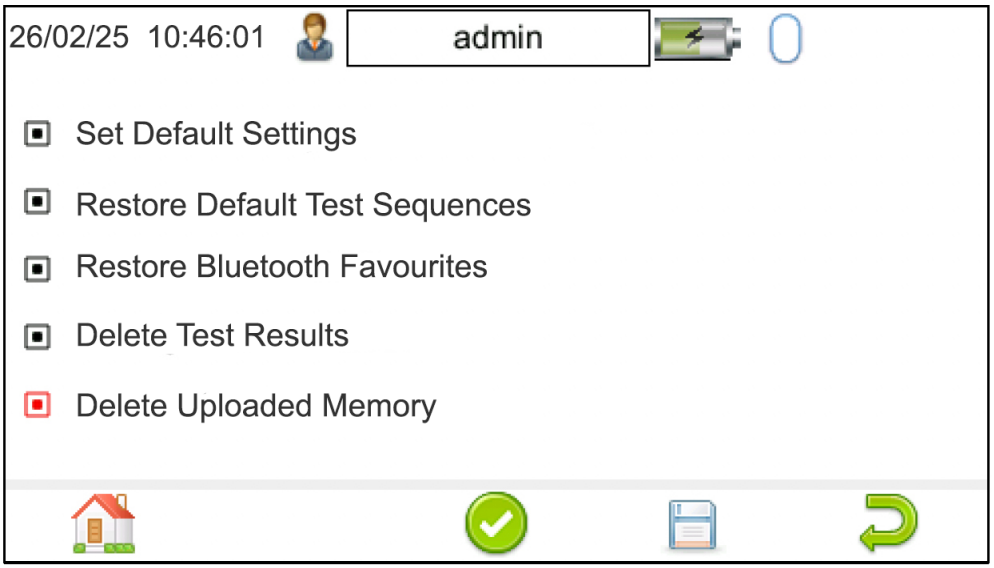
9.8 Main Menu Window – Memory Options

The Memory option can be used to reset factory settings/delete data or clear Bluetooth® settings on the instrument.

Select **Memory** (8), in the **Main Menu** to access the **Memory Usage** window.



Use **F4** to access the Memory options window:



The following delete / restore options are available:

- **Set Default Settings** reset factory user settings
- **Restore Default Test Sequences** resets factory test sequences
- **Delete Bluetooth Favourites** deletes the Bluetooth® favourites
- **Delete Test Results** deletes tested results
- **Delete Uploaded Memory** deletes uploaded results

Use the up/down keyboard keys to highlight the red square to the left of the item required to delete/restore.

With the item highlighted now use the left/right keyboard arrow keys to place a smaller square within highlight square. Alternatively, the **Accept** button (**F3**) can be used.

When Save (F4) is selected the following warning message is displayed.

If you are sure you want to continue select **Y** or use the return key, finally a confirmation message will be displayed and the delete/restore is complete.

ATTENTION

Data loss
Once data has been deleted it cannot be recovered.

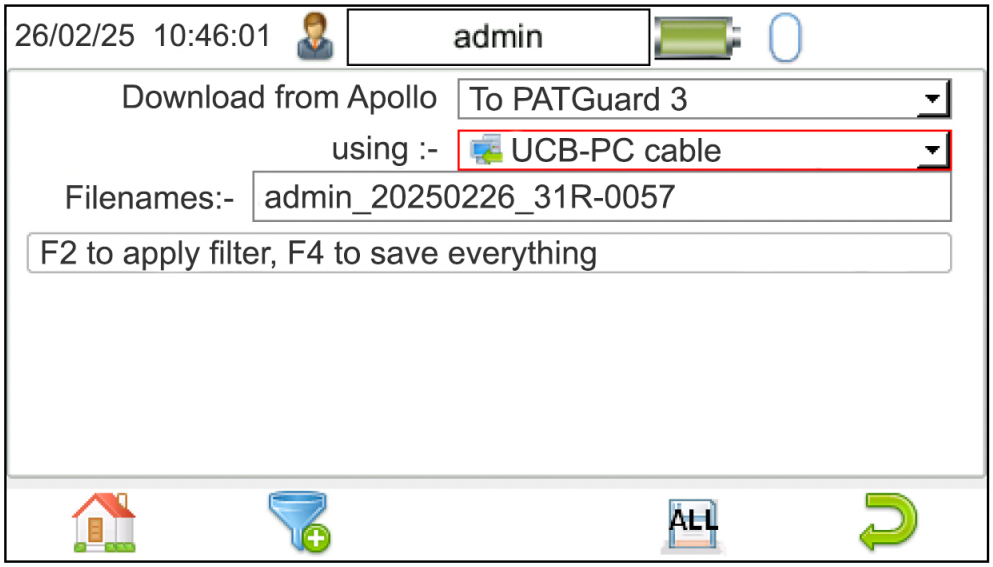
10. Downloading your Instrument

The instrument can download in the following formats:

- **To PATGuard 3**creates a .gar file for use with PATGuard 3
- **Clone Data**creates a backup file (.tar) with the current user setting
- **ASCII**creates a .txt file
- **To other software** creates a .tar file for use with other software

10.1 Downloading From Your Instrument to PATGuard 3

From the **Main Menu** select **Download**  by using the keyboard arrow keys or selecting key number **5**.



In the **Download from Apollo** field select **To PATGuard 3**, using the keyboard arrow keys to select from the dropdown menu.

a) In the **using:-** field select  **USB-PC cable**.

or

b) In the **using:-** field select  **Flash Memory Stick**.

or

c) In the **using:-** field select  **Wi-Fi**.

Add or alter the filename in the **Filename** field.

a) Connect the USB lead between the PC and instrument.

or

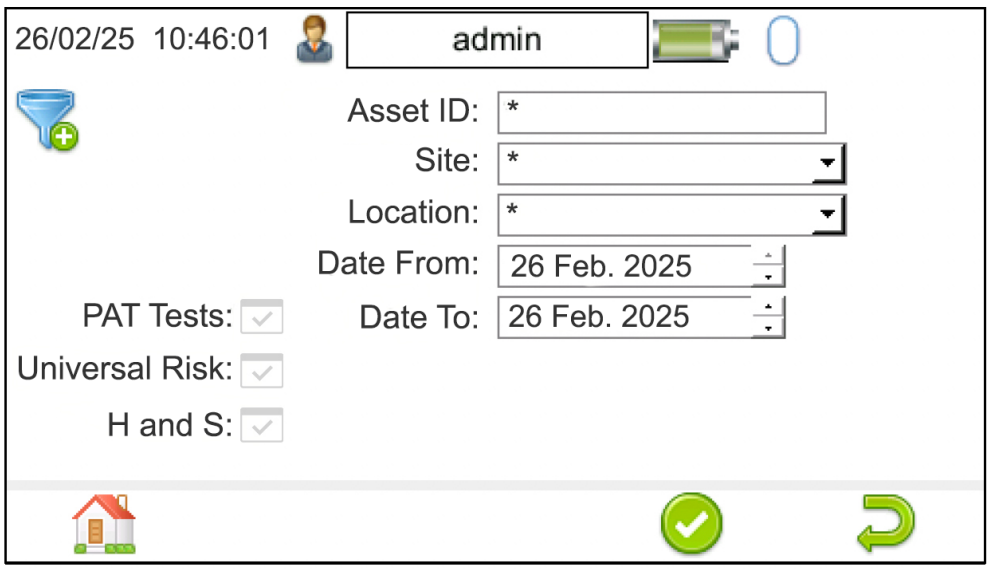
b) You will be prompted to **Insert USB memory stick** any data on this memory stick will be displayed in the bottom box.

or

c) Make sure the local Wi-Fi hotspot is active (see chapter 9.4).

You now have a choice of either downloading all data 

(**F4**) or to filter by selecting  (**F2**).



If filtering the data, select the filters you wish to apply using the keyboard arrow keys and when complete press **Accept** using  (**F4**).

Press the **START** button (**F3**) to initiate the downloading process. For a) and b) the download is complete after the blue bar reaches 100% and either:

a) the file appears in an additional instrument drive (for example “Apollo E:”) that will now appear on your PC. This can be viewed using the file manager.

b) the file appears on the memory stick, remove the memory stick from the instrument and transfer it to the PC.

For c) the instrument will display the **Wi-Fi Download** screen, initially at 0% with the Status: **Initialising Wi-Fi.** After a few moments a blue progress bar will complete to 100% and status will change to **Wi-Fi Ready for Transfer**. The instrument now has created a Wi-Fi hotspot to connect to.

Note

It is advised to turn off mobile data and Bluetooth® to avoid any connection issues.
As the instrument does not provide internet access, some mobile devices will attempt to make internet connections via mobile data which will interfere with the ability to connect to the instrument’s download server.

Search for and once found click the Apollo SSID to connect and when prompted enter the password. Your mobile device now is connected to the Apollo+ Wi-Fi Hotspot.

Note

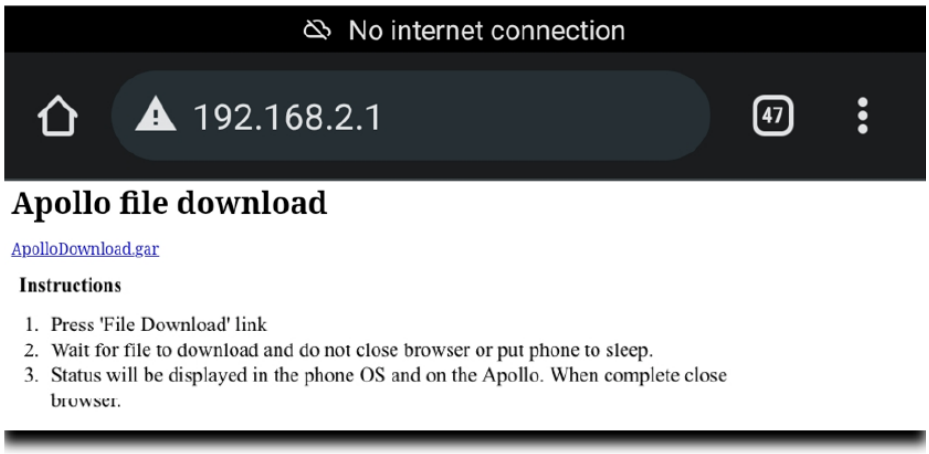
Your mobile device may display a message that the device you are connecting to does not have internet access, this is expected, simply accept the connection

Once the mobile device is connected to the Wi-Fi hotspot, there are 2 methods for downloading the data:

1) via barcode scan:
Scan the QR Code displayed on the **Wi-Fi Download** screen and a link appears that will take you to the download web page.

2) via web browser:
Iin the address bar enter the details as displayed on the instrument screen (http://192.168.2.1)

In both instances the web browser will navigate to a download page with a hyperlink as shown below. Click this link and the mobile device will initiate the download and save the results to internal memory.



You now need to forward the downloaded data to the PC with PATGuard 3, e.g. through emailing it. Refer to your mobile device's documentation in case of questions.

Open PATGuard 3 on your PC. If you already have a database open you are ready to download, if not, you will need to either open a file (database) or create a new database.

In an open PATGuard 3 database select **Instruments** and then **Add a Test Instrument** using the icon – select your instrument name using the dropdown and enter the instrument serial number.

Select **Data Transfer** and **Download from Tester**, if you receive a message **Error: Unable to detect an available com port**, click to accept.

Select your instrument from the dropdown box and

a) Browse for the *.gar file in the instrument drive. Select **open**, then **OK** and your downloaded data should appear in the PATGuard 3 database.

b) Browse for the *.gar file on the flash memory stick. Select **open**, then **OK** and your downloaded data should appear in the PATGuard 3 database.

c) Browse for the *.gar file on your PC, depending on where you saved it to after transferring it via the mobile device. Select **open**, then **OK** and your downloaded data should appear in the PATGuard 3 database.

See PATGuard 3 help guide for more information.

10.2 Downloading Clone Data from an Instrument

Note

Downloading clone data can be used to backup current user settings or to transfer to an-other instrument.

From the **Main Menu** select **Download**  by using the keyboard arrow keys or selecting key number **5**.

In the **Download from Apollo** field select **Clone Data**, using the keyboard arrow keys to select from the dropdown menu.

a) In the **using:-** field select  USB-PC cable.

or

b) In the **using:-** field select  Flash Memory Stick.

or

c) In the **using:-** field select  Wi-Fi.

For

a) Connect the USB lead between the PC and instrument.

or

b) You will be prompted to Insert USB memory stick any data on this memory stick will be displayed in the bottom box.

or

c) Make sure the local Wi-Fi hotspot is active (see chapter 9.4).

Press **Start** respectively **Save All**  (**F4**).

For

a) you will need to save the file to a location on your PC.

b) the file has been copied to the USB stick and you can remove it from the instrument.

c) the instrument will display the **Wi-Fi Download** screen, initially at 0% with the Status: **Initialising Wi-Fi.** After a few moments a blue progress bar will complete to 100% and status will change to **Wi-Fi Ready for Transfer**. The instrument now has created a Wi-Fi hotspot to connect to.

Note

It is advised to turn off mobile data and Bluetooth® to avoid any connection issues.
As the instrument does not provide internet access, some mobile devices will attempt to make internet connections via mobile data which will interfere with the ability to connect to the instrument's download server.

On your mobile device, search for and once found click the Apollo SSID to connect and when prompted enter the password. Your mobile device now is connected to the Apollo+ Wi-Fi Hotspot

Note

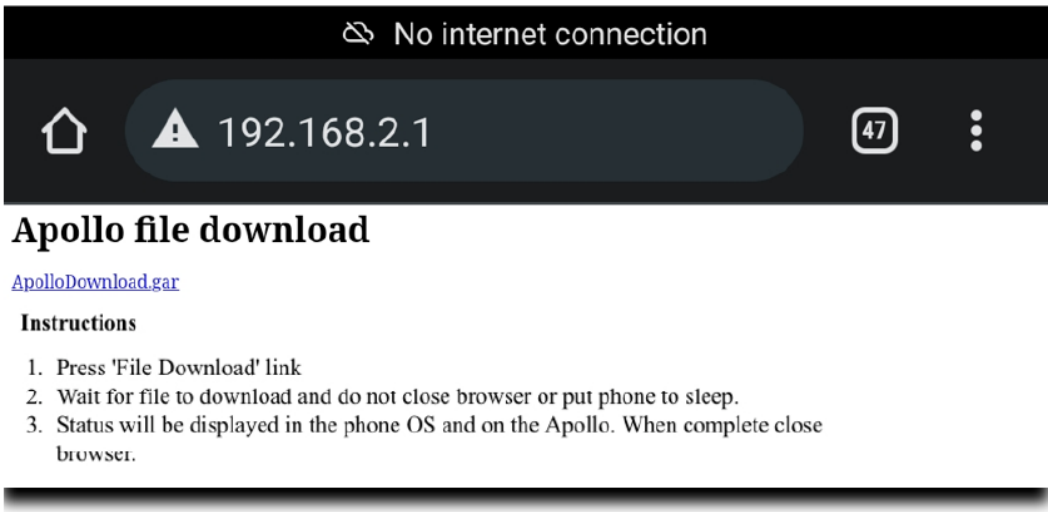
Your mobile device may display a message that the device you are connecting to does not have internet access, this is expected, simply accept the connection

Once the mobile device is connected to the Wi-Fi Hotspot, there are 2 methods for downloading the data:

1) via barcode scan:
Scan the QR Code displayed on the Wi-Fi Download screen and a link appears that will take you to the download web page.

2) via web browser:
in the address bar enter the details as displayed on the Apollo+ screen (http://192.168.2.1)

In both instances the web browser will navigate to a download page with a hyperlink as shown below. Click this link and the mobile device will initiate the download and save the results to internal memory.



You now need to forward the downloaded data to the PC with PATGuard 3, e.g. through emailing it. Refer to your mobile device's documentation in case of questions.

11. Uploading your Instrument

The instrument can **Upload** from the following:

- **From PATGuard 3** uploads a .gar file from PATGuard 3
- **Printer Logos** uploads custom logo that can be used on 75 mm labels of a connected printer
- **Clone Data** uploads a backup file (.tar) with the current user setting
- **Background images** uploads an image that can be used for a background image
- **List Configuration Data** uploads user defined configuration data

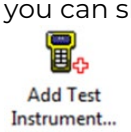
11.1 Uploading from PATGuard 3 to an Instrument

If you want to upload a PATGuard 3 file, your must have the file available:

a) If you want to upload from your PC, it must be saved on it;

b) if you want to upload from a USB stick you must save it onto the flash memory stick;

c) if you want to upload via Wi-Fi, the file must be transferred to a mobile device, e.g. via first saving it to a PC and then emailing it to your mobile device.

For b) and c) you must, if you have not already, save the PATGuard 3 data as preparation (for a) you can skip this). To do so, in PATGuard 3 select **Instruments** and **Add Test Instrument** 

. In **PAT Testing** 

, select the **Site** or **Location** you wish to upload.

Select the **Data Transfer** tab and **Upload to Tester** 

, select the **Destination** test instrument and correct drive. Next select the Site & Location you want to upload including the data to be included (where applicable) and press **OK**. A message saying **File Saved Successfully :\ApolloUpload.gar** should appear.

On the instrument. from the **Main Menu** select **Upload**  by using the keyboard arrow keys or selecting key number **7**.

In the **Upload data into Apollo** field select **From PATGuard 3**, using the keyboard arrow keys to select from the dropdown menu.

In the **using:-** field select

a)  **USB-PC cable**.
and an additional instrument drive (for example “ApolloXXXX:”) will appear on your PC, as long as a USB cable is connected

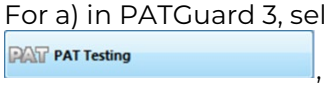
or

b)  **Flash Memory Stick**.

or

c)  **Wi-Fi**.

For a) in PATGuard 3, select **Instruments** and **Add Test Instrument** 

. In **PAT Testing** 

, select the **Site** or **Location** you wish to upload.

Select the **Data Transfer** tab and **Upload to Tester** 

, select the **Destination** test instrument and "ApolloXXXX:" drive. Next select the Site & Location you want to upload including the data to be included (where applicable) and press **OK**.

A message saying **File Saved Successfully :\ApolloUpload.gar** should appear on the PC

On the instrument the message **Save data to Apollo drive, press F3 when done** appears, select this using the function key  (F3). The following message will then appear on the instrument: **Valid Data files from PC**. Select one of these files and press F4. Select the file containing your uploaded data (*.gar), using the keyboard arrows keys, and save by selecting  (F4) (USB-PC cable). A message saying **SSS data uploaded OK** will be shown on the instrument.

For b) select the file containing your uploaded data (*.gar), using the arrows keys, and save by selecting  **(F4) (Flash Memory Stick)**. A message saying **SSS data uploaded OK** will be shown on the instrument.

For c) the instrument will display the Wi-Fi Download screen, initially at 0% with the Status: **Initialising Wi-Fi.** After a few moments a blue progress bar will complete to 100% and status will change to **Wi-Fi Ready for Transfer**.
The instrument now has created a Wi-Fi hotspot to connect to.

Note

It is advised to turn off mobile data and Bluetooth® to avoid any connection issues.
As the Apollo does not provide internet access, some mobile devices will attempt to make internet connections via mobile data which will interfere with the ability to connect to the Apollo download server.

On your mobile device, search for and once found click the Apollo SSID to connect and when prompted enter the password. Your mobile device now is connected to the Apollo+ Wi-Fi Hotspot.

Note

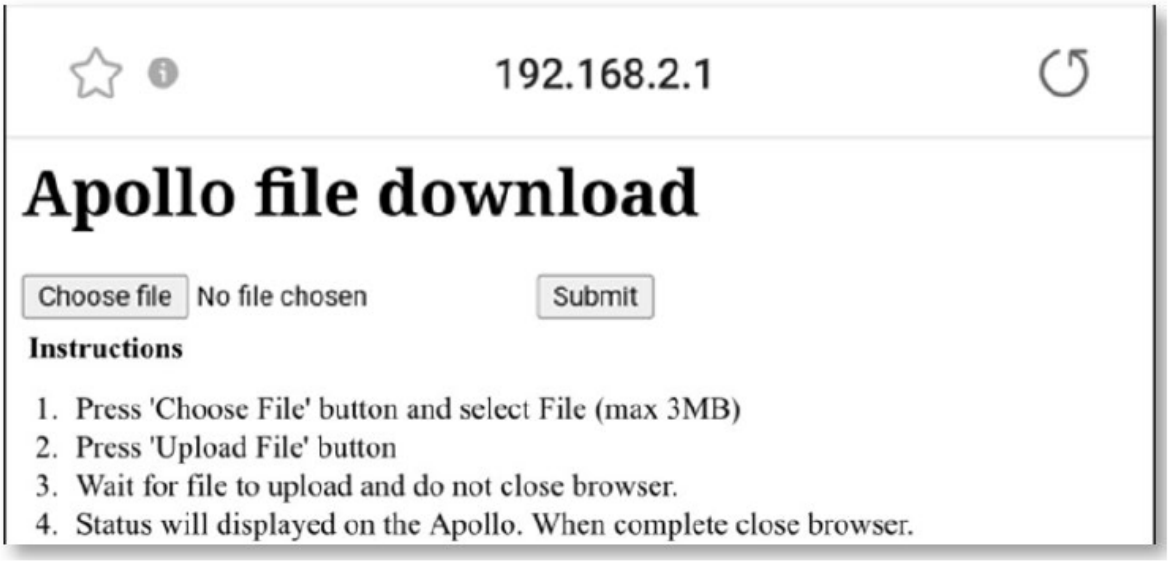
Your mobile device may display a message that the device you are connecting to does not have internet access, this is expected, simply accept the connection

Once the mobile device is connected to the Wi-Fi Hotspot, there are 2 methods for downloading the data:

1) via barcode scan:
Scan the QR Code displayed on the Wi-Fi Download screen and a link appears that will take you to the download web page.

2) via web browser:
in the address bar enter the details as displayed on the Apollo+ screen (http://192.168.2.1)

In both instances the web browser will navigate to an upload page with a hyperlink as shown below.



Click Choose file to access the device memory and from here find and select the correct file you wish to upload.

Once selected, the filename will be displayed within the Upload Webpage, press the Submit button to send the file to the Apollo.

Depending upon the file size, wait a few seconds to minutes and the instrument will display a message in relation to the file it has received, and request the file to be accepted. Select **(Y)** or **Yes** and the file will be stored in memory.

The uploaded data is displayed in a different location to the already tested data:

From the instrument's **Home Screen** select **Main Menu** (F4), then select **View Data**, (1) and then the **Filter** button (F2).

In the **Status:** section select **Uploaded** using the keyboard arrow keys and confirm with (F4). In this new list all the uploaded data will be displayed.

11.2 Uploading Printer Logos

To use custom logos for printing with a connected printer, you must first upload the logo and then set it up it for printing.

Note

Custom logos can only be used on 75 mm labels.

Uploading the logo to the Instrument

Uploading a logo is very similar to the upload procedure described in chapter 'Uploading from PATGuard 3 to an Instrument' on page 46.

You must have the logo file ready, depending on the method chosen.

Note

Create your logo ensuring it is a .bmp (bitmap image), it is black and white (monochrome and 1 bit depth), has maximum image dimensions of 320 pixels × 240 pixels and has a maximum file size of approximately 15,000 Bytes (15KB).

On the instrument, in the **Main Menu** select **Upload**  by using the keyboard arrow keys or selecting key number **7**.

In the **Upload data into Apollo** field select **Printer Logos**, using the keyboard arrow keys to select from the dropdown menu.

Follow one of the upload methods described in in chapter 'Uploading from PATGuard 3 to an Instrument' on page 46.

When the file is successfully uploaded **New printer logos installed OK** will appear above the file name.

Return to the **Main Menu** using function key **F5**. 

Select the Logo

- ✓ Test data is already stored on the instrument.
- ✓ You have set up the printer. See the product documentation of the printer.

Select **View Data**  by selecting number **1.**

Select an asset using the keyboard arrow keys and **Accept**  (F4).

Select a full test result using **F4** again to display the **Test Details** for the asset.

Select menu/options, function key **F4**, to display the **Test Results Option**. 

Highlight and select **Print Label** using the keyboard arrow keys and **Accept**  (F4).

A virtual image of the current label is shown on the instrument and other label formats can be selected using function key  (F3).

To select the logo that was uploaded use the **Tools** function key  (F2)

Using the keyboard arrow keys, select either the **Pass Logo**: or **Fail Logo:** field, the uploaded logo should be available for selection. After highlighting the required logo, ensure you select the correct **Printer** and then save this setting by using Save  (F3).

Your logo should now appear on the instrument, as a virtual label image, and is ready to be printed. Alternative versions of the label can be selected using the function key  (F3).

11.3 Uploading Clone Data to an Instrument

Uploading a clone data is very similar to the upload procedure described in chapter 'Uploading from PATGuard 3 to an Instrument' on page 46.

You must have the clone data file ready, depending on the method chosen.

On the instrument, in the **Main Menu** select **Upload**  by using the keyboard arrow keys or selecting key number **7**.

In the **Upload data into Apollo** field select **Clone Data**, using the keyboard arrow keys to select from the dropdown menu.

Follow one of the upload methods described in in chapter 'Uploading from PATGuard 3 to an Instrument' on page 46.

When the file is successfully uploaded a message stating **Clone Completed OK, now power off** is displayed, switch the instrument off and then back on again to complete the upload.

11.4 Uploading Background Images to an Instrument

Uploading a background image is very similar to the upload procedure described in chapter 'Uploading from PATGuard 3 to an Instrument' on page 46.

You must have the background image file ready, depending on the method chosen.

Note

Create your background image ensuring it is .png format and 478 × 190 pixels (to fill the screen). If you upload a smaller image, it will be repeatedly displayed on the screen creat-ing a tiled effect.

On the instrument, in the **Main Menu** select **Upload**  by using the keyboard arrow keys or selecting key number **7**.

In the **Upload data into Apollo** field select **Background Images**, using the keyboard arrow keys to select from the dropdown menu.

Follow one of the upload methods described in in chapter 'Uploading from PATGuard 3 to an Instrument' on page 46.

When the file is successfully uploaded **New Background image installed OK** will appear above the file name.

Return to the **Main Menu** using function key **F5**. 

From the **Main Menu** select **Users**  by selecting number **2**.

The current user **Background image** can up changed / updated using the arrow keys to select from the dropdown.

Confirm the **User** changes by selecting **Save**  (F4).

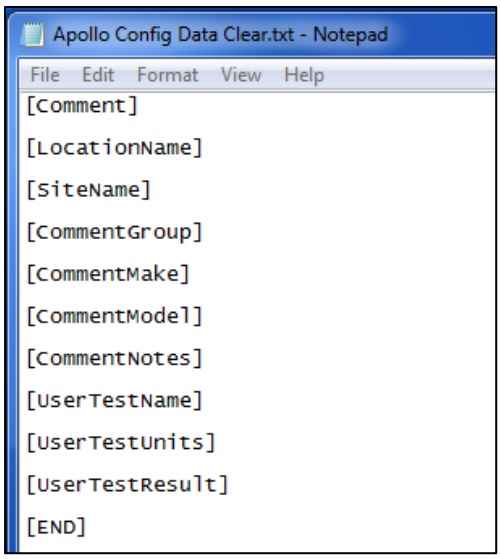
11.5 Uploading List Configuration Data to an Instrument

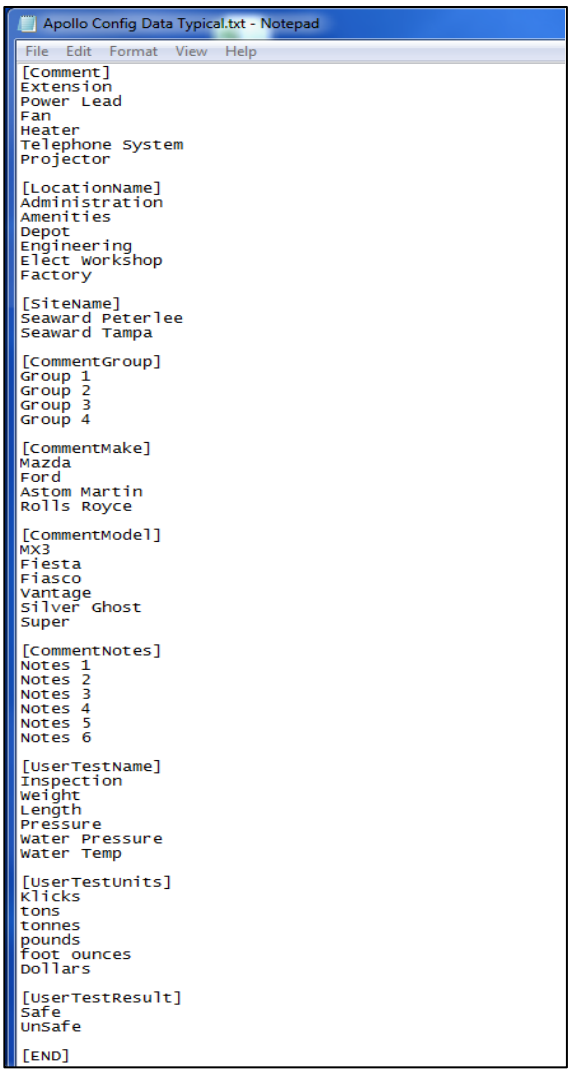
The instrument will allow you to upload a text file containing an updated list of descriptions that can be selected by the instrument. The lists that can be updated are:

```
Asset Description [Comment] 300
Location  [LocationName]100
Site[SiteName]100
Asset Group[CommentGroup]100
Make[CommentMake]100
Model[CommentModel]100
Notes[CommentNotes]100
Custom User Test[UserTestName]100
Custom User Test Units[UserTestUnits]100
Result of Custom User Test[UserTestResult]100
```

[In brackets are the names used by the text file to represent that field and the maximum number of possible entries.]

The text file used to update the instrument must use the names above, and [END] and in the format below (note; this example is shown without data – just the field names). For an example showing data please see below for an example of a populated text file.





Uploading list configuration data is very similar to the upload procedure described in chapter ‘Uploading from PATGuard 3 to an Instrument’ on page 46.

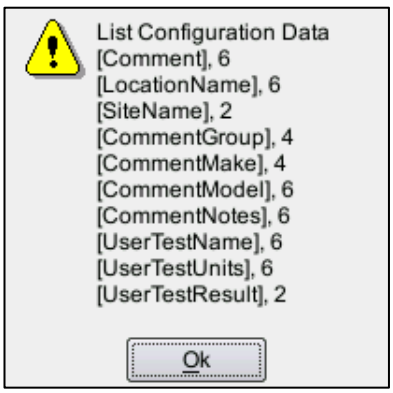
You must have the text file ready, depending on the method chosen.

On the instrument, in the **Main Menu** select **Upload**  by using the keyboard arrow keys or selecting key number **7**.

In the **Upload data into Apollo** field select **List Configuration Data**, using the keyboard arrow keys to select from the dropdown menu.

Follow one of the upload methods described in in chapter 'Uploading from PATGuard 3 to an Instrument' on page 46.

The instrument will begin the upload and in the **Apollo Configuration Upload** message display the field name and number of each uploaded, for example:



Press **OK** to accept the upload. This uploaded data can then be used from the dropdown selections when setting up / using your instrument.

12. Performing an Electrical Safety Test – Auto Mode

The **Portable Appliance Testing** window can be selected from the **Home Screen** by selecting PAT (F1).

Use F1 to return to the **Home Screen**.

Use F2 to enter the **Automatic PAT** screen.

Use F3 to enter the **Manual PAT** screen.

Use F4 to setup the **User Options** / **PAT Settings** page, see chapter 'User Options (PAT Settings)'.

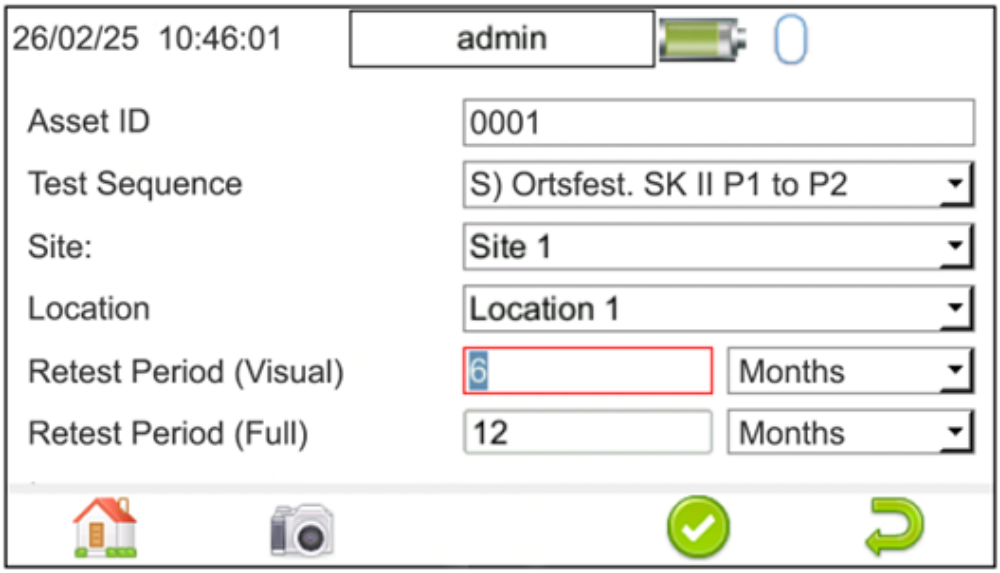
F5 is a shortcut to the **View Data** option, use this to view stored **Test Results** or stored **Uploaded Data**.

The instrument comes with a number of pre-defined **Test Sequences**. These **Test Sequences** can include any combination of electrical or user defined tests and they are performed on equipment to ensure that it meets the safety requirements.

From the **Home** screen select PAT (F1) to enter the **Portable Appliance Testing** screen.

Select **Auto Mode** by pressing PAT (F2).

Select the **Risk Assessment** option by pressing (F3).



Asset ID

This is unique identifier for the EUT. This can be entered using the keypad, a scanner (see 'Main Menu Window - Connecting Bluetooth® Devices'), or set to automatically increment (see 'User Options (PAT Settings)').

Test Sequence

This is the name of the pre-defined (or User Defined) **Test Sequence** which will be performed on the equipment. Select the appropriate **Test Sequence** from the dropdown menu using the keyboard arrow keys or by pressing the appropriate letter.

Site

This is the **Site** where the equipment is located. You can choose a **Site** from the dropdown using the keyboard arrow keys, enter a new one or use a scanner (see 'Main Menu Window - Connecting Bluetooth® Devices').

Location

This is the **Location** within the site where the equipment is. You can choose a **Location** from the dropdown using the keyboard arrow keys, enter a new one or use a scanner (see 'Main Menu Window - Connecting Bluetooth® Devices').

Retest Period (Visual)

This is the period, in **months** or **weeks**, in which the equipment should be re-inspected.

Retest Period (Full)

This is the period, in **months** or **weeks**, in which the equipment should be re-inspected.

12.1 Auto Mode – Camera Function

 **Camera Function**. You can use the **Camera** function (F2) to attach photos to the asset record.

 Press this button (F1) to take the picture.

 This button (F2) will enable and disable the flashlight.

 This button (F3) will attach the picture and go back to the record. Note a smaller attach icon  will be shown on the **Auto Mode** test window. To add another picture, press the **Camera** button again.

 This button (F4) will cancel the picture and allow you to take another.

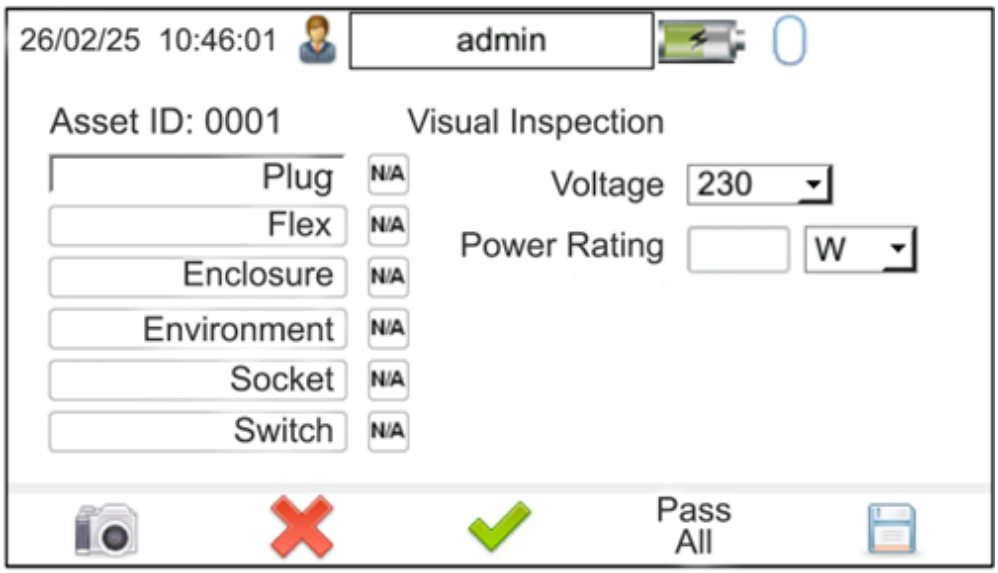
 Use F5 to return to the **Auto Mode** test window.

Regarding photograph locations when downloaded from the instrument into PATGuard 3, there are two options:

- If the photograph is taken in the Auto Mode window it will appear as the main picture in PATGuard 3 (in the Asset Details page)
- If the photograph is taken during, or after the test, this picture will show in the Test Results – you will need to double click on the Test Results to view the Test Details page

12.2 Auto Mode – The Visual Inspection

In general, Auto-Portable Appliance Tests (PAT) will start with a **Visual Inspection**.



 Using the Camera in this screen (F1) will tag the picture to the test result.

 This is the **Fail** icon – use the keyboard arrow keys to highlight the parameter and F2 to **Fail** this part of the test.

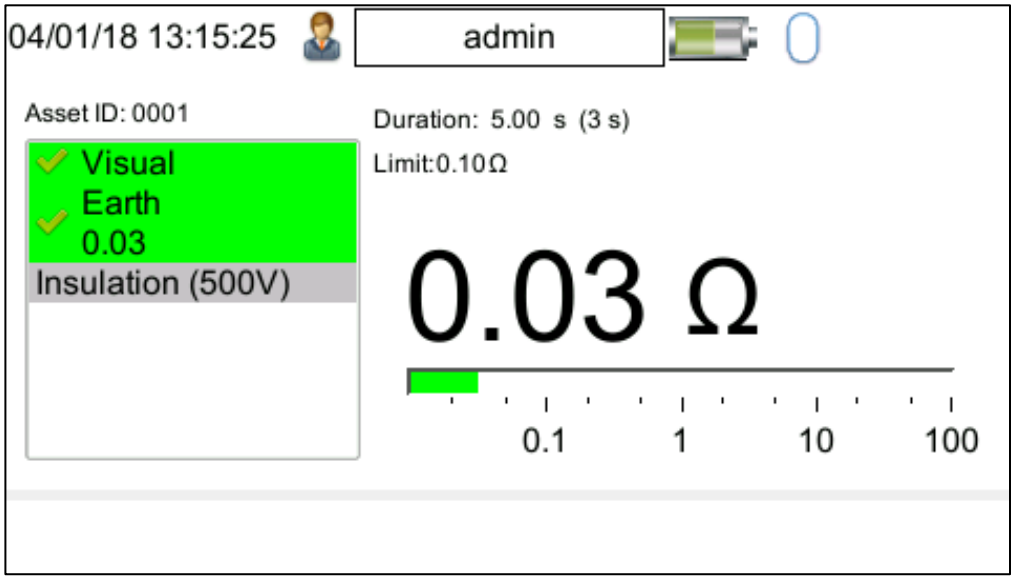
 This is the **Pass** icon – use the keyboard arrow keys to highlight the parameter and F3 to **Pass** this part of the test.

Pass All Use F4 to **Pass All** parameters and move on to the next test in the **Test Sequence**.

 Use F5 to **Save** the elements of the **Visual Inspection** performed (using F2 and F3) and move onto the next test in the **Test Sequence**.

12.3 Auto Mode – The Electrical Tests

In general, the second stage of the Auto-Portable Appliance Test (PAT) are the practical electrical tests.



The instrument has probe detection that will automatically flag up if you do not have the correct probe configuration for the test you are trying to perform.

During the tests you can see the test duration, limit and result on screen, see 'Getting to Know Your Instrument'.

Should any test with the sequence fail the sequence will be aborted and you will be presented with the Notes screen by default but this can be changed, see 'User Options (PAT Settings)'.

13. Performing an Electrical Safety Test – Manual Mode

WARNING

Risk of electric shock

Measurements are carried out with mains and measuring voltages. If measurements are carried out incorrectly, electric shocks can result.

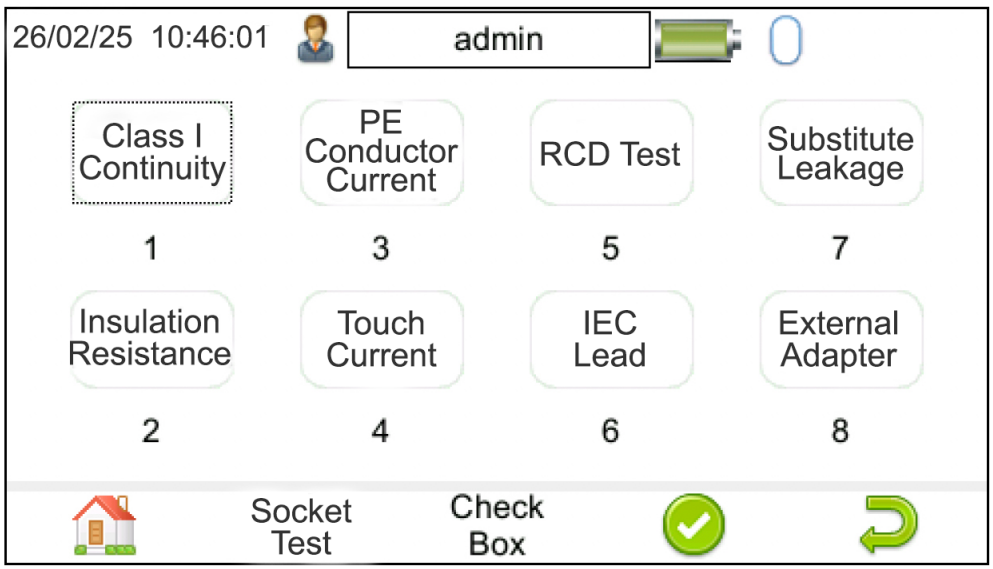
- Always ensure that you have selected the correct test connection method in the test for the probe connections made.

The instrument allows direct access to all the electrical tests through the **Manual Mode**.

From the **Home** screen select PAT (F1) to enter the **Portable Appliance Testing** screen.

Select **Manual Mode** by pressing PAT (F3).

Select the required test using either the **number keys**, the function keys or the arrow keys and use the **Accept** (F4).



To view / edit / configure the test settings of a **Manual Test**, where appropriate, you can change the test duration, test pass / fail limit or test type / connection. Once the required parameters have been selected use **Tools** (F3) and select **Save** F4.

Null The test leads can be nulled prior to testing – this applies when performing **Continuity** tests so the resistance of the leads is not included in the final resistance value.

Where appropriate, to perform the test press the green Start button on the instrument.

Please refer to 'Test Functions' for specific information about each test type.

14. Test Functions

14.1 Earth Continuity

DANGER

Risk of electric shock

Connecting a test probe to a hazardous voltage when a point-to-point measurement is active will result in that voltage being present on the other tests probes.

- Always ensure that the circuit under test is electrically isolated.

WARNING

Risk of electric shock

Connecting a test probe to a hazardous voltage when a point-to-point measurement is active will result in that voltage being present on the other tests probes.

- Do not touch the metal ends of the test probes.
- Always ensure that you have selected the appropriate test type for the probe connections.

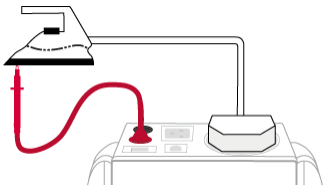
Note

Measurements can be adversely affected by parallel resistances of additional circuits or by transient currents.

This test is applicable to Class I equipment. This test will measure one of the following:

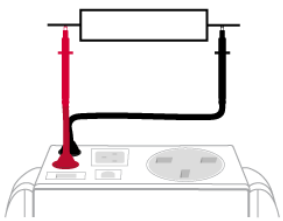
- resistance between the protective earth terminal in the EUT mains plug and the point at which a single test probe is applied – **CLI EUT Continuity**
- resistance between two test probes – **Point to Point Continuity**
- resistance between the protective earth terminal in an IEC lead mains plug and the protective earth terminal in the IEC connector – **IEC Continuity**

To ensure that the connection is satisfactory and of sufficiently low resistance, the measurement will be displayed in Ohms. There are three possible connection methods for the Earth Continuity test.



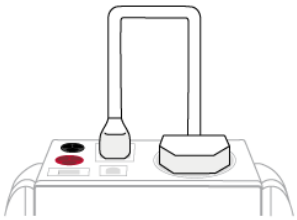
CLI EUT Continuity

The test is performed between the red test terminal and the EUT test socket.



Point to Point Continuity

This test is performed between the red test terminal and the black test terminal.



IEC Continuity
The test is performed between the EUT test socket and the IEC test socket.

Note that if the Earth continuity is above the pass setting and fails if you chose Restart test you will see a calculator symbol(F3)

This opens the lead length limit calculator, choose the cable size and length from the drop-down menus and it will set a new limit for that test. Accept the new limit F4 and this returns you back to the test screen and the green key restarts the test with the new limit.

14.1.1 Selecting a Test Type

In **Manual PAT** test mode, the **Earth Continuity** test can be switched between a **Class I EUT continuity** test and a **point to point continuity** test as follows:

Select **Class I Continuity** (1) and press the Tools key  (F3). In the Test Type field, select **EUT Continuity Test** or **Point to Point Continuity Test**.

During automatic sequences, the test type will be as per the test type programmed in the test sequence. Once the correct connections have been made for the selected test type, press the **Start** button. The test will continue until it times out. If we wish to abort the current test press the **Stop** button. Tests on IEC leads, CLI EUTs can be performed using a current of +200 mA and/or -200 mA. Tests performed in point-to-point mode are always performed using a current +200 mA test. The direction of the test current can be reversed by switching the test probes at the point of connection to the appliance/circuit under test.

Nulling out the Earth Continuity test lead(s) resistance

For a more accurate earth continuity measurement, the resistance of the test lead(s) can be zeroed out. The feature can be used with both the **EUT Continuity** and **Point to Point** measurement modes.

The null facility remains active, even if the instrument is powered off, until the feature is deactivated by pressing the null key again or the Test Type is changed e.g. if a pair of test leads are nulled for point-to-point measurement, the null will be deactivated if the Test Type is changed to EUT Continuity test.

Nulling a single test lead

In the manual PAT screen, press the setup key (F3) and change the Test Type to EUT Continuity Test. Press save (F4). Connect the earth continuity test lead to the earth continuity test socket and connect the probe tip to the earth pin of the EUT socket. Press Null (F4) to measure and stored the test lead resistance. When the null feature is active the Null icon will appear on the display.

Nulling both test leads

In the manual PAT screen, press the setup key (F3) and change the **Test Type** to **Point to Point Continuity** Test. Press save (F4). Connect both earth continuity test leads to the earth continuity test sockets and connect the probe tips together using the supplied alligator clips. Press Null (F4) to measure and stored the test lead resistance. When the null feature is active the Null icon will appear on the display.

14.2 Insulation Resistance

DANGER

Risk of electric shock

Connecting a test probe to a hazardous voltage when a point-to-point measurement is active will result in that voltage being present on the other tests probes.

- Always ensure that the circuit under test is electrically isolated.

DANGER

Risk of electric shock. Danger of resulting accidents!

The test is carried out with up to 500 V_{DC}. Touching the L or N connections of the test socket or the test probe will result in an electric shock, despite current limitation.

- Do not touch the L or N connections of the test socket or the test probe.

WARNING

Risk of electric shock

Connecting a test probe to a hazardous voltage when a point-to-point measurement is active will result in that voltage being present on the other tests probes.

- Do not touch the metal ends of the test probes.
- Always ensure that you have selected the appropriate test type for the probe connections.

Note

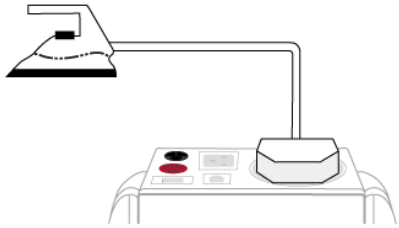
- If you receive as message stating there is an error with the insulation resistance test, then this could have occurred during the previous insulation test – this previous test must be repeated.
- If the EUT is not switched on, the insulation resistance cannot be measured properly. Ensure that the appliance mains switch is in the **ON** position.

This test is applicable to **Class I** and **Class II** equipment. This test will measure one of the following:

- **Insulation Resistance** between live circuits and the protective earth circuit in the EUT – **Class I / IEC lead insulation test**
- **Insulation Resistance** between live circuits and a test probe applied to the EUT – **Class II insulation test**
- **Insulation Resistance** between two test probes – **Point to Point Insulation**

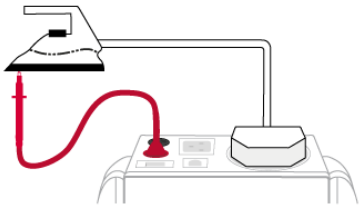
To ensure that the test points are adequately insulated from one another, the measurement is displayed in MΩ.

There are three possible connection methods for the Insulation test.

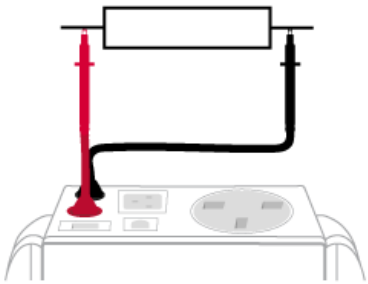


CLI and IEC Insulation Resistance
The test is performed between the EUT test socket live and neutral and the EUT test socket earth pin.

For IEC leads the other end of the lead should be connected into the IEC test socket.



CLII Insulation Resistance
The test is performed between the EUT test socket live and neutral and Red test terminal.



Point to Point Insulation Resistance
The test is performed between the Red and Black test terminals, both the continuity test leads are required for this test.

14.2.1 Selecting a Test Type

In **Manual** PAT test mode, the **Insulation Resistance** test can be switched between a **250V EUT Insulation** test, **500V EUT Insulation** test, **250V Point to Point Insulation** test or **500V Point to Point Insulation** test as follows:

Select **Insulation Resistance** (2) and press the **Tools** key (F3). In the **Test Type** field, select the required test.

During automatic sequences, the test type will be as per the test type programmed in the test sequence.

In **Manual Mode** once the correct connections have been made for the selected test type press the **Start** button, in automatic mode the test will proceed automatically. The test will continue until it times out. If we wish to abort the current test press the **Stop** button. The measurement will be displayed in Mega Ohms.

If a EUT fails the **Insulation Resistance** test, then this may be because of internal filtering or an MOV. Retry the test at 250 V or substitute the **Insulation Resistance** test with a **Protective Conductor** (class 1) or **Touch Current** test (class 2).

14.3 Protective Earth (PE) Conductor Current (Used on Class 1 Appliances)

DANGER

Risk of electric shock

Accessible conductive parts could be under voltage if the PE is interrupted.

- Always test the earth continuity and insulation resistance before performing a PE Conductor Current test
- Always check that an appliance with moving parts (e.g. an electric drill) is safely mounted to avoid risk of damage to equipment or personnel.
- Avoid prolonged, repeated use at full load (16A) and excessive test duration as this may reduce the life of the unit.

ATTENTION

Incorrect measurements being recorded

If an intermediate PRCD is not switched on, the measured values will be incorrect.

- Always ensure that the RCD is switched on before the beginning of the test.

This test is applicable on Class I Equipment

The instrument should be connected to a mains supply. The EUT should be connected into the EUT test socket.
In **Manual Mode** once the correct connections have been made for the selected test type press the **Start** button, in Automatic Mode the test will proceed automatically.

The test will continue until it times out. If we wish to abort the current test press the **Stop** button. The measurement will be displayed in mA. Should the test measurement over range then the test will be aborted immediately and a fail will be shown.

14.4 Touch Current

DANGER

Risk of electric shock

The EUT may carry voltage.

- Always use a probe to scan the EUT.
- Do not touch the EUT.
- Always test the insulation resistance before performing a Touch Current test.

WARNING

Risk of injury from moving parts

If a EUT is switched on for the test, parts can move mechanically. This can cause risk of damage to equipment or personnel.

- Always check that an appliance with moving parts (e.g. an electric drill) is safely mounted.

ATTENTION

Overload

Prolonged repeated use can damage the tester.

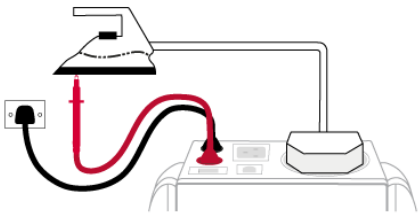
- Avoid prolonged, repeated use at full load (16 A) and excessive test duration.
- Observe the load.

ATTENTION

Incorrect measurements being recorded

If an intermediate PRCD is not switched on, the measured values will be incorrect.

- Always ensure that the RCD is switched on before the beginning of the test.



This test is applicable on Class I and Class II Equipment

The instrument should be connected to a mains supply. The EUT should be connected into the EUT socket; the red test terminal should be connected to point at which the leakage measurement is required.

In **Manual Mode** once the correct connections have been made for the selected test type press the **Start** button, in automatic mode the test will proceed automatically. The test will continue until it times out. If we wish to abort the current test press the **Stop** button. The measurement will be displayed in milli Amps.

Should the test measurement over range then the test will be aborted immediately and a fail will be shown.

14.5 RCD Trip Time

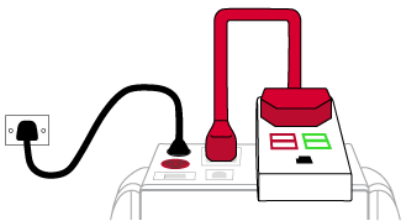
ATTENTION

Incorrect measurements being recorded

Voltages between the protective conductor and earth may influence measurements.

- Remove all other connections before performing an RCD test.

This test will pass a sinusoidal current of 30 mA between the EUT socket and the IEC socket, and measure the time it takes for the in-line RCD to trip.



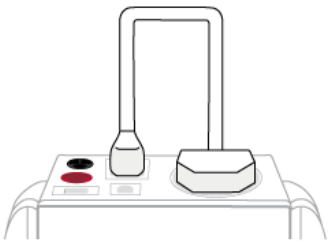
The instrument should be connected to a mains supply. The RCD should be plugged into the EUT test socket on the instrument and a connection should be made from the RCD mains output to the IEC test socket.

Once the correct connections have been made for the selected test type, press the Start button. The RCD will be powered and you will be prompted to reset the RCD. When you have reset the RCD the instrument will count down and then perform the RCD test, the RCD trip time will be displayed. The measurement will be displayed in milli seconds.

14.6 IEC Lead / Polarity

ATTENTION

Damaged instrument due to unsuitable voltage
The IEC lead input is a test socket and is not intended to be connected directly to mains.
Do not connect the IEC lead input to the mains supply.



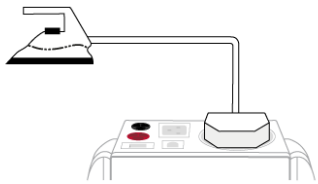
The Polarity test checks the wiring polarity of an IEC lead, the IEC should be plugged into both the EUT socket and IEC test sockets on the instrument.

This test can be used to test the wiring polarity of extension leads by plugging the supplied test IEC lead into the end of the extension lead to complete the circuit to the IEC tests socket.

In the **Automatic** sequence editor, the **Polarity** can be added to sequence. In the **Manual Mode** the polarity test is already part of a pre-defined test sequence which includes an **Earth Continuity** test, **Insulation resistance** and the **Polarity** test.

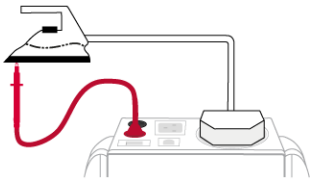
14.7 Substitute (Alternative) Leakage

This test is applicable to **Class I** and **Class II** equipment; it is used to verify that the **Leakage** between the mains conductors of the EUT to the EUT earth pin, or conductive accessible surface of the enclosure, is to a satisfactory low level.
There are two possible connection methods for the **Substitute (Alternative) Leakage** test.



CLI and IEC Substitute (Alternative) Leakage

The test is performed between the EUT test socket live and neutral and the EUT socket earth pin.
For IEC leads the other end of the lead should be connected into the IEC test socket.



CLII Substitute (Alternative) Leakage

The test is performed between the EUT socket live and neutral and Red test terminal.

During this test, 40 V_{AC} is applied between the earth pin and both the live and neutral pins of the appliance mains supply plug.
In **Manual Mode** once the correct connections have been made for the selected test type press the **Start** button, in automatic mode the test will proceed automatically. The test will continue until it times out. If we wish to abort the current test press the **Stop** button. The measurement will be displayed in mA.

This test can prove useful in situations where neither conventional insulation nor flash tests are acceptable methods of testing the insulation of the appliance.
Please note that values for **Substitute (Alternative) Leakage** may differ substantially from that of conventional earth leakage tests because of the way that the test is performed (e.g. it will be affected by the presence of Neutral-to-Earth suppression capacitors). Substitute (alternative) leakage is measured between both line and neutral and the protective earth conductor. It is

similar to an **Insulation Resistance** measurement except that a test voltage of 40V/50 Hz is used rather than 500 V_{DC}. The measured current is then automatically scaled by the tester to show the leakage that would present at mains voltage (i.e. scaled by a factor of 6). If the appliance under test has filter components between both Line-Earth and Neutral-Earth (eg as with some washing machines) the **Substitute Alternative) Leakage** method will measure both leakage currents.

14.8 External 3 Phase Leakage Adaptors

The 32A 3 Phase Leakage Adaptor 5 Star (391A931) and 16A 3 Phase Leakage Adaptor 5 Star (391A930) are external 3-phase test adaptors for conducting Earth continuity RPE and leakage current IPE testing (direct measurement method) with the APOLLO 600+ instrument.

The product can be used to connect EUT equipped with either a CEE plug or socket only to the instrument (which is equipped with a safety socket only).

The model 391A930 is suited for 16 A and the model 391A931 is suited for 32 A.

See the 32A 3 Phase Leakage Adaptor 5 Star and 16A 3 Phase Leakage Adaptor 5 Star manual for all information on how to perform testing.

14.9 Socket Test

ATTENTION

Damaged instrument due to unsuitable voltage
The IEC lead input is a test socket and is not intended to be connected directly to mains.

- Do not connect the IEC lead input to the mains supply.

Note

- The socket test uses the Black Mains lead and Black Test Socket to perform the test.
- Remove all connections before performing an RCD test to avoid recording incorrect measurements.
- Inspect the socket visually for damage before starting the test.

The instrument is supplied with a **Black** Mains lead, this lead needs to be plugged into the **Black** test socket on the instrument and to the socket to be tested.

From the **Home Screen**  select PAT (F1) then select the **Manual PAT** button  (F3).

In the **Manual PAT** window select **Check Box** (F3).

Use the green start  button to perform the **Socket Test**.

Alternatively, there is a pre-set **Auto Test Sequence** on the instrument for the **Socket Test**. This allows an inspection and electrical test to be performed on the **Socket** to be tested.

14.10 Function Verification – Checkbox Feature

Note

The Checkbox function will perform a number of electrical tests.
Ensure that the onscreen instructions are followed and that you do not touch the Apollo Checkbox during the active tests.

The instrument is supplied with an Apollo Checkbox. The Apollo Checkbox can be used to verify that the instrument's test functions are working correctly. When selecting the Apollo Checkbox function follow the onscreen instructions.

From the **Home Screen**  select PAT (F1) then select the **Manual PAT** button  (F3).

In the **Manual PAT** window select **Check Box** (F3).

You will now see a **Checkbox Setup** message:

Connect the **Mains Supply** to the **Black** socket on the instrument
Connect the **Red** IEC lead between the EUT socket and the IEC on the instrument (do not connect the **Checkbox** yet)

An IEC lead and polarity test will be performed to check this lead

You will now see a page requesting you to **Attach checkbox**.

Keep the **Red** IEC lead connected to the EUT socket on the instrument and then connect the **Checkbox**

Connect the **Red** test lead to the **Red** test socket on the instrument and then connect the probe to the 4mm socket on the **Checkbox**, you may need to use the crocodile clip.

Select  (F3) to confirm (a green tick will appear in the middle of the page) and, if required, then select  (F5) to continue.

The instrument will now perform additional tests in a sequence.

After completion of the above you should see a **Warning** message before the **Mains Supply** is applied – you will need to select the green start  button to perform a mains powered test.

The **Test Sequence** should now be complete and a message displaying the outcome will be displayed – confirm this using the **Return** key (the button above the green start button).

15. Updating your Firmware

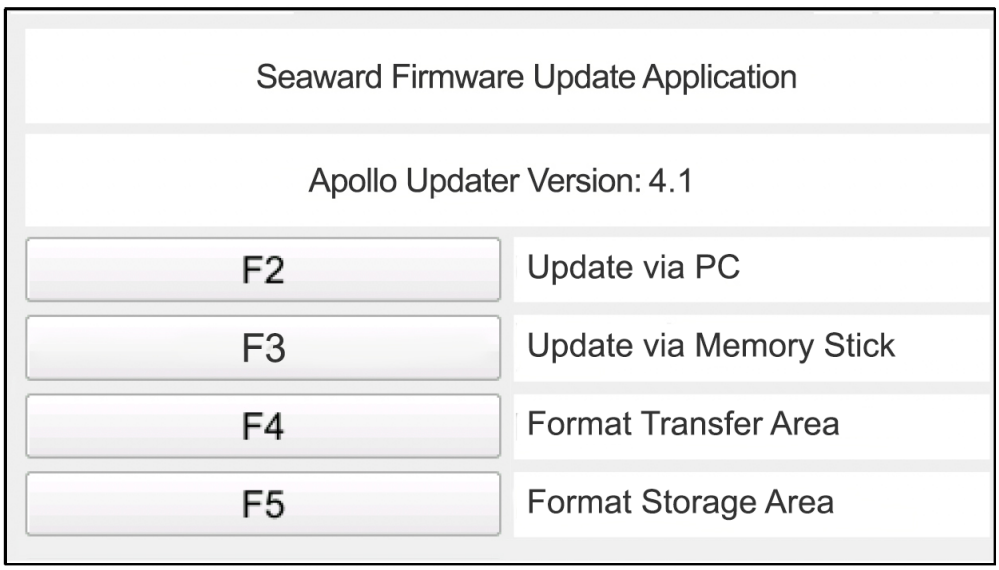
To check the firmware version on your instrument, select **Information** (F5), from the **Home Screen** the instrument and firmware version are displayed at the bottom of the screen.

To check / download the latest version of firmware visit the following:

https://www.gossenmetrawatt.de/service-support/download-center/

Make sure you backup (download) any data on your instrument beforehand. You may want to also clone (download) your settings data so that you can upload these afterwards.

Make sure the instrument is switched off. Press and hold the function key F1, then press the **ON** button to power on the instrument, keeping the F1 key depressed until the updater screen is displayed.



Press **F2** to **Update via PC**. Connect the USB lead between the PC and the instrument and press **F1**, as instructed.

Copy the downloaded firmware file (with extension **.tar.bz2**) to the new instrument drive on your PC (for example “Apollo (E:)”)

Press **F1** to begin the firmware update – when the update is complete the display will show **Update complete, restart the system or press F1 to return to the main menu**.

Press and hold the **OFF** button until the instrument powers off. The firmware update, via the PC, is now complete and the instrument is ready to use.

16. Storage and Transport

ATTENTION

Improper storage

Damage to the product and measuring error due to environmental influences

- Store the instrument in the original carrying case and only within the limits of permissible ambient conditions.

ATTENTION

Improper transport

Damage to the product and measuring error

- Transport the instrument only within the limits of permissible ambient conditions.
- Only use the original carrying case to transport the instrument.

17. Maintenance

17.1 Cleaning

DANGER

Life endangering due to electric shock!

The instrument and its accessories are operated with electrical power, therefore there is a general risk of electric shock. This can be fatal or cause serious injuries.

- The instrument, the accessories and all connected conductors must be voltage-free before and during cleaning. Switch the test instrument off and disconnect it from the mains power supply.
- Never immerse the instrument/accessories in water or other fluids.
- Never touch the instrument/accessories with wet or moist hands.

ATTENTION

Unsuitable cleaning agents

Unsuitable cleaning agents such as aggressive or abrasive cleansers result in damage to the instrument/accessories.

- Use a dry, lint-free cloth or a cloth which has been slightly dampened with water for cleaning.

Keep the outside surfaces of the instrument and any accessories clean.

17.2 Calibration

Use of your instrument and resultant stressing influence the instrument and lead to deviation from warranted accuracy values.

In the case of strict measuring accuracy requirements, as well as in the event of severe stressing (e.g. severe climatic or mechanical stress), we recommend a relatively short calibration interval of once per year.

Please contact our service department for calibration services, see page 77.

Note

The instrument is fully calibrated and found to be within the specified performance and accuracy at the time of production. The Seaward Group provides its products through a variety of channels; therefore, it may be possible that the calibration date on the provided certificate may not represent the actual date of first use.

Experience has indicated that the calibration of this instrument is not affected by storage prior to receipt by the user. We therefore recommend that the recalibration period be based on a 12 month interval from the first date the unit is placed into service.

18. Repair

If your instrument requires repair, please contact our service department, see page 77.

Note

Loss of warranty and guarantee claims
Unauthorized modification of the instrument is prohibited. This also includes opening the instrument.
If it can be ascertained that the instrument has been opened by unauthorized personnel, no guarantee claims can be honored by the manufacturer with regard to personal safety, measuring accuracy, compliance with applicable safety measures or any consequential damages.

- The device may only be repaired or opened by authorized, qualified personnel who are familiar with the associated dangers.
- Original replacement parts may only be installed by authorized, qualified personnel.

Note

Data protection
Data can be stored in the instrument. This may include personal and/or sensitive data.
Back up your data before sending the instrument for repair.
Also, be aware of the owner's or end user's own responsibility with regard to protecting personal and other potentially sensitive data in the instrument before sending it for repair.

19. Useful Information

19.1 Factory Set Test Sequences

Test Sequence	Visual Inspection	Protective Conductor Resistance		Type of Measurement	Insulation			Protective Conductor Current (Differential)		Touch Current (Direct)		Alternative Method		Continuity	RCD Trip Time
Name		**Duration (s)**	**Limit (Ω)**		**Duration (s)**	**Voltage (V_{DC})**	**Limit (MΩ)**	**Duration (s)**	**Limit (mA)**	**Duration (s)**	**Limit (mA)**	**Duration (s)**	**Limit (mA)**		**Limit (ms)**
Aktiv / Riso 500V SK I (Active / R_{ISO} 500 V PC I)	Yes	5	0.3		2	500	1	5	3.5						
Aktiv / Riso 500V SK II (Active / R_{ISO} 500 V PC II)	Yes				2	500	2			5	0.5				
Aktiv / Riso 500V SK I/II (Active / R_{ISO} 500 V PC I/II)	Yes	5	0.3		2	500	2	5	3.5	5	0.5				
Aktiv EDV / SK I (Active IT / PC I)	Yes	5	0.3					5	3.5						
Aktiv EDV / SK II (Active IT / PC II)	Yes									5	0.5				
Aktiv EDV / SK I/II (Active IT / PC I/II)	Yes	5	0.3					5	3.5	5	0.5				
Aktiv / Riso 250V SK I (Active / R_{ISO} 250 V PC I)	Yes	5	0.3		2	250	1	5	3.5						
Aktiv / Riso 250V SK II (Active / R_{ISO} 250 V PC II)	Yes				2	250	2			5	0.5				
Kaltgeraeteleitung 2m (Mains Lead 2 m)	Yes	5	0.2	IEC	2	500	1								

VLTG 5 m / 1,5 mm2 (Extension Cord 5 m / 1.5 mm²)	Yes	5	0.3	IEC	2	500	1							Yes	
VLTG 12,5 m / 1,5 mm2 (Extension Cord 12.5 m / 1.5 mm²)	Yes	5	0.4	IEC	2	500	1							Yes	
VLTG 30 m / 1,5 mm2 (Extension Cord 30 m / 1.5 mm²)	Yes	5	0.7	IEC	2	500	1							Yes	
VLTG 50 m / 1,5 mm2 (Extension Cord 50 m / 1.5 mm²)	Yes	5	0.9	IEC	2	500	1							Yes	
VLTG 5m / PRCD (Extension Cord 5 m / PRCD)	Yes	5	0.3	IEC	2	500	1	5	3.5						300
KBTL 50 m / 1,5 mm2 (Cable Reel 50 m / 1.5 mm²)	Yes	5	0.9	IEC	2	500	2							Yes	
KBTL 50 m / PRCD (Cable Reel 50 m / PRCD)	Yes	5	0.9	IEC	2	500	2								300
Passiv / Riso 500V SK I (Passive / R_{ISO} 500 V PC I)	Yes	5	0.3		2	500	2					5	3.5		
Passiv / Riso 500V SK II (Passive / R_{ISO} 500 V PC II)	Yes				2	500	2					5	0.5		
Ortsf. SK1 P1//P2 (Fixed Appliance PC I P1//P2)	Yes	5	0.5	P-P	2	500	1					5	0.5		
Ortsf. SK2 P1//P2 (Fixed Appliance PC II P1//P2)	Yes				2	500	2								

VLTG 30 m / 2,5 mm2 (Extension Cord 30 m / 2.5 mm²)	Yes	5	0.31	IEC	2	500	1							Yes	
VLTG 50 m / 2,5 mm2 (Extension Cord 50 m / 2.5 mm²)	Yes	5	0.45	IEC	2	500	1							Yes	
Besichtigung (EP) (Visual Inspection only)	Yes														

19.2 Other Information

Parameter Apollo 600+	Default	Min	Max
Earth Continuity Pass / Fail limit (Ω)	0.3	0.01	19
Earth Continuity Duration (s)	5	2	30
Insulation Resistance Pass / Fail limit (M Ω)	1	0.1	19
Insulation Resistance Duration (s)	2	2	30
Substitute (Alternative) Leakage Pass / Fail limit (mA)	3.5	0.25	19
Substitute (Alternative) Leakage Duration (s)	5	2	99
IEC Cord Earth Continuity Pass / Fail limit (Ω)	0.1	0.01	19
IEC Cord Insulation Pass / Fail limit (M Ω)	1	0.1	19
PE Conductor Current Pass / Fail limit (mA)	3.5	0.25	19
PE Conductor Current Duration (s)	5	2	240
Touch Current Pass / Fail limit (mA)	0.5	0.25	3.5
Touch Current Duration (s)	5	2	30
External Adapter Continuity (Ω)	0.1	0.01	19
External Adapter Leakage (mA)	0.75	0.25	9.99
External Adapter Duration (s)	2	2	30
RCD 30 mA trip time (ms)	300	1	2000
RCD 150 mA trip time (ms)	40	1	40
Number of Tests in a Test Sequence		1	60
Characters in a Test Sequence Name		1	30
Characters in a User Test name		1	40
Characters in a User Test Unit		1	12
Total number of Test Sequences			100
Test Results (Typical)			50000
Sites			100
Characters in Site name		1	15

Locations			100
Characters in Location name		1	15
Number of User Accounts (Including Admin)			50
Characters in User name		1	15
Comments List (Asset Description)			300
Comments List (Other Descriptions)			100
Characters in a Comment			25
Characters in Asset ID		1	15
Items in Custom Inspection Form		1	12
Characters in Inspection Form Item		1	20
Barcode, Standard Label Formats (25 mm and 75 mm)			6
Barcode, Extra Durable Label Formats (25 mm and 75 mm)			6
QR Code, Standard Label Formats (75 mm only)			6
QR Code, Extra Durable Label Formats (75 mm only)			6
RFID Reader (Comments Line Entry Only)			Yes

20. Service and Contact

GERMANY:

GMC-I Service GmbH
Beuthener Straße 41
90471 Nürnberg
Deutschland

+49 911 817718-0
service@gossenmetrawatt.com

For more information on service or calibration visit:
gmci-service.com/en

REST OF WORLD:

Calibrationhouse (UK)
11 Bracken Hill
South West Industrial Estate
Peterlee
County Durham
SR8 2LS

+44 (0) 191 587 8737
service@calibrationhouse.com

For more information on service or calibration visit:
calibrationhouse.com

21. Certifications

21.1 CE Declaration

Seaward Electronic Limited hereby declares that this product is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU and all other applicable EU directive requirements. The complete declaration of conformity is included in delivery and also can be found at:

www.seaward.com/gb/support/declarations-of-conformity/ seaward.com/DoC

21.2 Calibration Certificate

A calibration certificate is included with the instrument.

22. Disposal and Environmental Protection

Proper disposal makes an important contribution to the protection of our environment and the conservation of natural resources.

ATTENTION

Environmental damage

Improper disposal results in environmental damage.

Follow the instructions concerning return and disposal included in this section.

22.1 Disposal of Old Devices, Batteries and Rechargeable Batteries

Old devices and (rechargeable) batteries contain valuable raw materials that can be recycled, as well as hazardous substances which can cause serious harm to human health and the environment, and they must be recycled and disposed of correctly.

The symbol depicting a crossed-out garbage can on wheels refers to the legal obligation of the owner or end-user not to dispose of old devices and batteries or rechargeable batteries with unsorted municipal waste ("household trash"). The (rechargeable) batteries must be removed from the old device (where possible) without destroying them and the old device and the (rechargeable) batteries must be disposed of separately. The type and chemical composition of the (rechargeable) battery are indicated on the battery's labelling. If the abbreviations "Pb" for lead, "Cd" for cadmium or "Hg" for mercury are included, the (rechargeable) battery exceeds the limit value for the respective metal.

You are obliged to comply with respective local requirements and implement them correctly on site. Further information can be obtained, for example, from the responsible authorities or the local distributor.

Please also observe the owner's or end user's responsibility with regard to deleting personal data, as well as any other sensitive data, from old devices before disposal.

22.2 Disposal of Packaging Materials

Packaging and its parts must be correctly disposed of separately from unsorted municipal waste ("household trash").

You are obliged to comply with respective local requirements and implement them correctly on site. Further information can be obtained, for example, from the responsible authorities or the local distributor.

We recommend retaining the original packaging materials in case you might require servicing or calibration in the future.

WARNING

Danger of asphyxiation resulting from foils and other packaging materials

Children and other vulnerable persons may suffocate if they wrap themselves in packaging materials, or their components or foils, or if they pull them over their heads or swallow them.

- Keep packaging materials, as well as their components and foils, out of the reach of babies, children and other vulnerable persons.

22.3 Regulations for the Federal Republic of Germany

The following comments refer specifically to the legal situation in the Federal Republic of Germany.

Old devices, electrical or electronic accessories and batteries or rechargeable batteries

Old devices, electrical or electronic accessories, batteries and rechargeable batteries used in Germany can be returned free of charge to Gossen Metrawatt GmbH or the service provider responsible for their disposal in compliance with applicable regulations, in particular laws concerning packaging and hazardous goods. Batteries and rechargeable batteries must be returned in the discharged state or with appropriate precautions against short circuiting. Further information regarding returns can be found on our website.

Packaging Materials

Packaging which is not subject to so-called system participation is returned to the appointed service provider. Further information regarding returns can be found on our website.

SEAWARD

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