

Seaward Europa

Portable Appliance Tester

Revision 2.4 Software

Instruction Manual

270A555

September 1999

© 1999 Seaward Electronic Ltd.

Issue 5

Limited Warranty & Limitation of Liability

SEAWARD Electronic Limited guarantees this product for a period of 1 year. The period of warranty will be effective at the day of delivery.

© Copyright 1999

All rights reserved. Nothing from this edition may be multiplied, or made public in any form or manner, either electronically, mechanically, by photocopying, recording, or in any manner, without prior written consent from SEAWARD Electronic Limited. This also applies to accompanying drawings and diagrams.

Due to a policy of continuous development SEAWARD Electronic Limited reserves the right to alter the equipment specification and description outlined in this publication without prior notice and no part of this publication shall be deemed to be part of any contract for the equipment unless specifically referred to as an inclusion within such contract.

Table of Contents

Declaration of Conformity	1
Before Starting	2
Safety	3
CHAPTER 1 INTRODUCING THE TESTER	5
Introduction.....	5
Your Portable Appliance Tester	6
The Top Panel.....	7
The Keyboard.....	8
Definitions.....	9
Quick Reference.....	10
CHAPTER 2 CONNECTING THE TESTER	12
CHAPTER 3 USING THE TESTER.....	13
Introduction.....	13
Fast Key Menus	14
How to.....	14
How to perform Automatic Tests.....	15
Test Settings	16
Default Sequence.....	17
Use Testcodes	18
Options after Test.....	21
Abort Actions	22
How to use the Meter Display	24
How to view Test Results.....	27
Appliance Number.....	27

Table of Contents

Site Name	27
Location Name	28
User Name	28
Test Status	29
Storage Status	29
Date From	29
Date To	29
Search.....	30
Search Result.....	30
Appliance Test Results	30
How to perform Manual Tests	31
Entering Manual Mode	31
Performing a Manual Test.....	34
How to download Data	36
Destination	36
Output Connection	36
Baud Rate	37
Download Format.....	37
Appliance Number.....	38
Site Name	38
Location Name	39
User Name	39
Test Status	40
Storage Status	40
Date From	40
Date To	41
Search.....	41
How to print Barcode Labels and Testcodes	41

Table of Contents

To print barcode testcodes	42
To Print Barcode Pass/Fail Labels	42
How to use Setup	42
Edit Test Settings	43
Edit User List / Options	46
Edit Site List	49
Edit Location List.....	49
Change Time/Date	51
Set Language	51
System Configuration.....	51
Change Password.....	53
Set Brightness	53
Factory Settings	53
How to use the Memory	53
View Memory Used	54
Perform Memory Test	55
Delete Single Appliance.....	55
How to upload test details to your Europa	56
Clear Results Memory	56
Clear Upload Memory	57
How to change the User.....	57
How to use Help	58
Help Provided to the User.....	58
The effect of User Levels during Test Sequences.....	59
CHAPTER 4 TIPS & TROUBLESHOOTING	60
Power -On Self tests:	60
Sequence Warning Faults	61

Table of Contents

Safety Tests during operation	62
Temperature monitoring	63
Multiple Earth connections:	63
Barcodes	64
Interfacing.....	64
IrDA Port.....	68
CHAPTER 5 MAINTAINING THE TESTER.....	71
Cleaning the Tester	71
User Maintenance	71
CHAPTER 6 ACCESSORIES.....	73
Standard Accessories	73
Optional Accessories.....	74
CHAPTER 7 SPECIFICATIONS.....	75
Earth Bond Test	75
DC Earth Bond Test	75
Earth Screen Test	75
Insulation Test	76
Substitute Leakage Test.....	76
Leakage.....	76
Touch Leakage.....	77
Power Tests	77
IEC Lead Test	77
Mechanical	77
Environmental	78
APPENDIX A PURPOSE OF TESTS	79

Table of Contents

Earth Bond Test	79
Earth Screen Test	79
Insulation Test	79
Substitute Leakage Test.....	80
IEC Lead Test	80
Powered Tests	81
Leakage Test.....	82
Touch Leakage Test.....	82
Operation Test.....	83
APPENDIX B REFERENCE INFORMATION.....	84
Factory-set Test Sequences	84
Testcode Tables.....	85

Declaration of Conformity

for the

Seaward Europa Portable Appliance Tester

Manufactured by:

Seaward Electronic Ltd, Bracken Hill, South West Industrial Estate

Peterlee, County Durham, SR8 2SW, England

Millennium Statement

This product is Millennium compliant, and conforms fully to the document BSI DISC PD2000-1.

Statement of Conformity

Based on test results using appropriate standards, the product is in conformity with Electromagnetic Compatibility Directive 89/336/EEC and Low Voltage Directive 73/23/EEC


Standards used:

EN 61010-1 (1993) Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use

EN 50081-1 (1992) Electromagnetic Compatibility. Generic Emission Standard: EN55022 Class B

EN 50082-1 (1992) Electromagnetic Compatibility. Generic Immunity Standard: IEC1000-4-2, -4-3, -4-4, -4-5

The tests have been performed in a typical configuration.

This Conformity is indicated by the symbol , i.e. "Conformité Européenne"

Before Starting

Upon receipt of your Europa Tester:-

1. Check that all the component parts are present:-
 - Seaward Europa Tester
 - Earth Bond lead
 - 115V adaptor (UK market only)
 - Instruction Manual
 - Carrying Case
2. Read the operating instructions fully before conducting any tests.
3. Contact Seaward Electronic if you need information on training for Portable Appliance Testing. Courses can be arranged at Seaward, or at customer premises.
4. Data may be lost or altered in virtually any electronic memory under certain circumstances. Therefore Seaward Electronic assumes no responsibility for financial losses or claims due to data lost or otherwise rendered unusable whether as a result of abuse, improper use, defects, disregard of operating instructions or procedures, or any other allied causes.
5. Seaward Electronic reserve the right to update the software in instruments returned to themselves for repair or otherwise, without notifying the customers previously.

Seaward Electronic Limited can be contacted at:

Bracken Hill
South West Industrial Estate
Peterlee
Co. Durham
SR8 2SW
Tel : +44 (0)191 586 3511
Fax: +44 (0)191 586 0227
sales@seaward.co.uk

Safety

Note

Please read the following Safety Instructions before use !




Safety Precautions

The manual contains specific warning and caution statements where they apply.

A Warning will identify the conditions and actions that pose hazard(s) to the user.

A caution will identify the conditions and actions that may damage the Tester.

Symbols used within this manual and on the Tester are shown below:

	Risk of electric shock
	Warning of potential hazard
	Conformité Européenne

Use of the instrument in a manner not specified may impair safety. Read the following safety information carefully before attempting to operate the instrument.



Due to the potential hazards associated with any electrical circuit it is important that the user is familiar with the instructions covering the capabilities and operation of this instrument. The user should ensure that all reasonable safety precautions are followed and if any doubt exists should seek advice before proceeding.

This product is designed for use by suitably trained competent personnel and should be operated strictly in accordance with the instructions supplied.

Failure to comply with these instructions may expose the user to electrical hazard

This Tester performs a number of electrical tests which involve high voltages and high currents. Never touch the appliance being tested, or the test leads, whilst a test is in progress.

Always check all test leads for signs of damage prior to use. Never use damaged or defective leads.

Always ensure the mains supply to the Tester provides an adequate earth.

This manual contains information and warnings which must be heeded to ensure user safety during operation. It is essential that this manual is read fully before proceeding with any tests.

Should the Tester behave abnormally do not continue with the testing. Disconnect immediately and contact Seaward Electronic for servicing (see Chapter 5 - Maintaining the Tester).

Chapter 1 Introducing the Tester

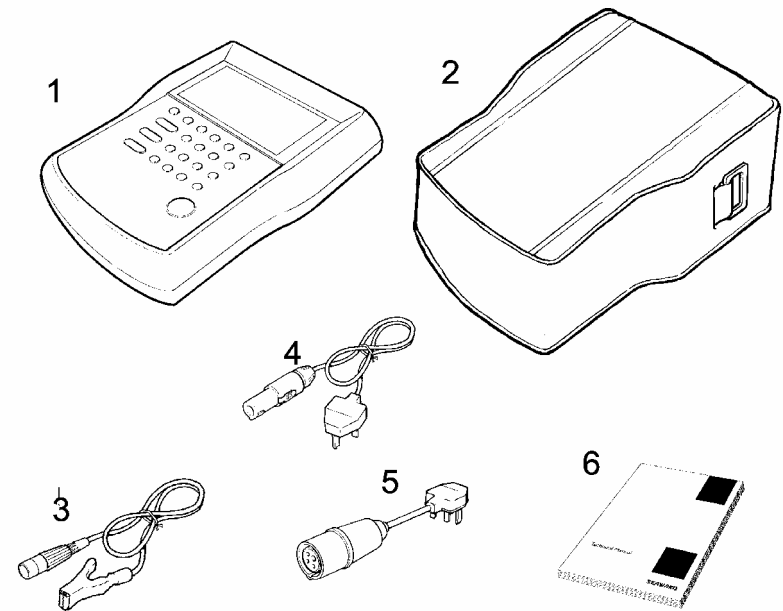
Introduction

The Seaward Europa Portable Appliance Tester is a powerful tool to assist in the analysis of the safety of portable electrical and electronic equipment. A range of tests are provided, with innovative features to aid difficult test situations, which allow testing of a wide variety of equipment.

The Tester is designed to be easy to use, and also includes the following innovative features:-

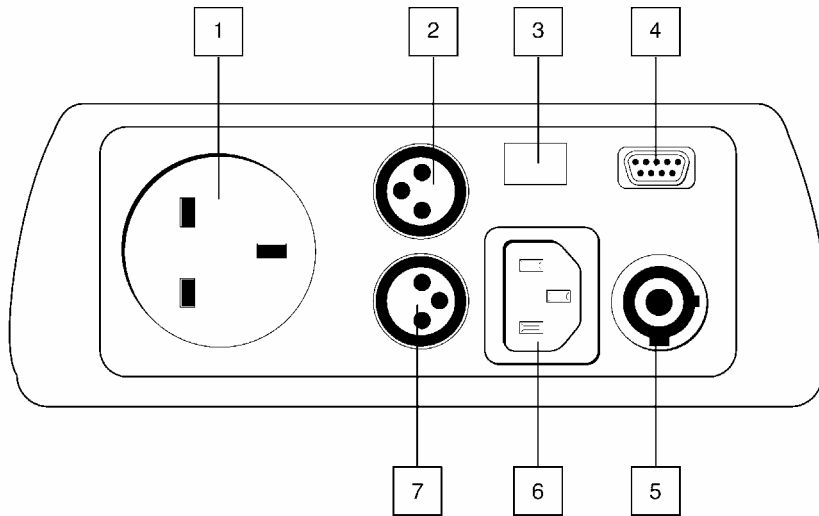
- Multi-voltage tester
- Stores up to 2400 results including appliances, location, site, date and time in non-volatile flash memory
- Accurate earth bond and leakage measurement even when multiple earth paths exist
- Alpha-numeric keyboard with fast keys.
- Full graphics display, Real-time clock
- Connects to PC, Barcode reader and printer
- Compatible with Seaward's PATs Plus and other leading software packages (including Seaward's PATSwin software package)
- Software adjusts the user interface to differing levels of expertise
- Auto testcode generation
- Fast Start-up
- Superfast download up to 10 times quicker than existing testers

Your Portable Appliance Tester



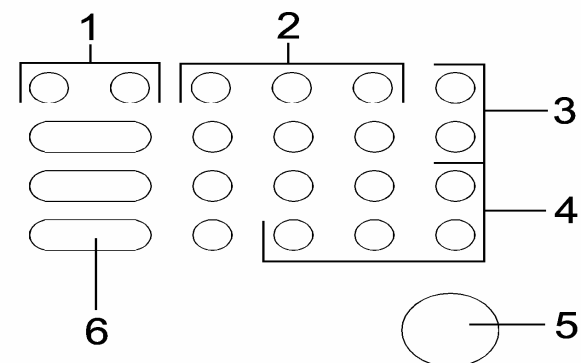
Item Number	Part
1	Europa Appliance Tester
2	Carrying case
3	Earth Bond Lead
4	230V Supply Lead
5	115V Test Lead (UK market only)
6	Manual

The Top Panel



Item Number	Part
1	Mains socket
2	Main Earth Bond/Insulation socket
3	IrDA Interface
4	RS232 Interface
5	230V Mains socket
6	IEC Lead connector
7	Auxiliary Earth Bond socket, for point to point earth bond measurement

The Keyboard



Item Number	Part
1	'Fast' Keys
2	Alpha-numeric Keyboard
3	'Space' and 'Delete' keys
4	Cursor keys
5	Enter button
6	Red button

The user is provided with a 320 x 240 1/4 VGA Graphical Liquid Crystal Display (LCD). The keyboard consists of an alpha-numeric keyboard, together with specific function keys. To the left hand side of the keyboard are four function keys which allow the user fast access to options displayed on the Display.

There are four cursor keys used to navigate the menus.

To the bottom of the keyboard are the two main function keys which perform execute and cancel function as well as Start and Stop.

It is possible to enter alphabetical letters using the keyboard. To do this first you must hold down the shift key and then press a key on the alpha-numeric keyboard, the first letter in the sequence will then be displayed. To continue through the sequence press the same alpha-numeric again.

If you do not press the same alpha-numeric key, or you press a different alpha-numeric key then the displayed digit will be accepted. If you pressed a different alpha-numeric key then the first letter in that sequence will be displayed.

The Europa also has the ability to use non-standard characters which can be displayed by pressing the 'Symbols' key during text entry. Simply use the cursor keys to highlight the required character and press the Enter button. You can also use numeric keys 1-9 to move you to extreme points of the symbol matrix.

The Shift can also be used when editing text

Shift and	Result
Left key	Go to start of line
Right key	Go to end of line
Up key	Go to start of text
Down key	Go to end of text
Delete key	Delete character under cursor

Definitions

Equipment Under Test (EUT)	The electrical / electronic apparatus which is the subject of testing.
Powered Tests -	The EUT is supplied with mains voltage, with measurements being taken of power consumption, leakage currents etc.
Fastkeys -	The keys with symbols to the left of the keyboard. These are used to select menu options displayed on the screen.
Tester -	The Seaward Europa Portable Appliance Tester
Un-powered Tests -	The EUT is the subject of electrical tests using stimuli generated within the Tester. The EUT is not provided with mains power.
User -	The test technician using the Tester to perform tests on an EUT

Quick Reference

Editing the date in all modes

On delivery of the Europa it is necessary to ensure that the correct time and a date are stored. Once stored the time/date is retained in memory and does not need to be entered again. To edit the date: from the MAIN MENU select SETUP, select CHANGE TIME/DATE, use the cursor keys to highlight the digit to be changed. To store the changed time/date setting return to the MAIN MENU. The unit will then display the message STORING SYSTEM DATA.

Entering a User Name

On delivery of Europa it is necessary to ensure that a user name(s) is stored. To edit the user list: from the MAIN MENU select SETUP, select EDIT USER LIST / OPTIONS, use the cursor keys and select a name, a screen will appear "EDIT USER SETTINGS", press Enter, use the keyboard to type in the desired name and press ENTER to return to the previous menu.

Storing Appliance Test Results in Automatic mode

The Appliance Test Results will not be stored until you leave the COMMENTS MENU, upon leaving this menu the unit will display the messages STORING RESULTS then SAVED OK. Your results have now been stored.

Storing Appliance Test Results in Manual mode

The Appliance Test Results will not be stored until a Manual Appliance Sequence has been completed. To do this firstly press A, this will prompt you for an Appliance number, enter this and press ENTER twice. Perform the tests required then press C, this will prompt you to enter comments, select SAVE COMMENTS/RESULTS and press ENTER. The unit will then display the messages STORING RESULTS then SAVED OK. Your results have now been stored.

Storing System Data

System Data consists of everything changed from within the SETUP MENU. To store the System Data return to the MAIN MENU from the SETUP MENU. The unit will then display the message STORING SYSTEM DATA.

Waiting for a Yes/No response

When you are prompted to respond with YES or NO you must use the fastkeys under the display.

Using Symbols in Text Fields

Although there is an option to use non-ascii symbols as Appliance numbers, Site & Location descriptions, User names and comments does not guarantee that your computer software will support them. If you are unsure avoid using symbols.

10 Digit Restriction

When you first receive you Europa the Appliance and Comments will be set to '10 Digit Restriction'. If you are using compatible software then this option can be set to 'Full Length'. When set to 'Full Length' the maximum Appliance length is extended to 15 characters while the maximum line for the comments is extended to 20 characters per line. See Tips and Troubleshooting for further information.

Chapter 2 Connecting the Tester

The Tester must be powered by a 230V supply and will test both 230V and 115V appliances.

The supply must include an earth connection (e.g. via a 3 pin plug).

When switched on, the Tester will carry out a short self-test procedure (approximately 2 seconds). During this test, the following screen will appear:-



Note

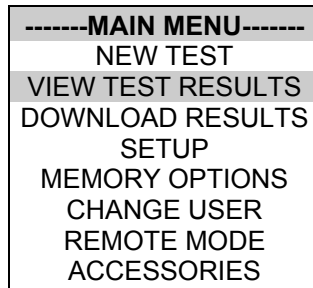
Current revision numbers are shown at the bottom of the screen.

The Tester will then display the Main Menu

Chapter 3 Using the Tester

Introduction

Once the start-up procedure of the Tester has been completed, the following screen will appear:-



USER : John

Thursday 4 March 1999 09:03

Navigation through the menus is by dedicated keys:-

Key	Function
←	Cursor Left
↑	Cursor Up
→	Cursor Right
↓	Cursor Down
'Red' Button	No / Abort
Large Button	Yes/Go/Enter

There are also the four Fast keys down the left-hand side of the keypad whose action will change depending on the function of the Tester at any particular point.

To select an option from the Main Menu, use the cursor keys. The selected option will be highlighted by a light-coloured bar. The highlighted selection is actioned by pressing the Enter button.

Fast Key Menus

To facilitate a fast access to commonly used options on the menus, use the 'fast' keys on the keyboard. These are identified by having icons above the keys. These correspond to the icons on the bottom of the screen.

How to....

The remainder of this chapter has been sub-divided into sections describes the Tester in terms of the essential functions to be performed. A summary is shown below:-

- How to perform Automatic tests
- How to use the Meter display
- How to view test results
- How to perform Manual tests
- How to download test results
- How to use Setup
- How to use the memory
- How to change the user
- How to use Help
- How to use a Barcode Scanner

How to perform Automatic Tests

To perform automatic tests, use the cursor keys to highlight the New Test option on the Main Menu and press Enter to display the following menus:-

----ENTER APPLIANCE DETAILS----
APPLIANCE :
SITE : SEAWARD
LOCATION : CAD ROOM
OK

Use the keyboard or a compatible Barcode Reader to enter an Appliance Number.

Note

See Chapter 4 for tips on using barcodes.

If you need to change the current Site use the cursor keys to highlight SITE and press Enter to change the Site Name.

-----SITE LIST-----
SEAWARD
BSX LTD
HSH OFFICES

Use the cursor keys to highlight a site name and press enter to select the desired option.

If you need to change the current Location use the cursor keys to highlight LOCATION and press Enter to change the Site Name

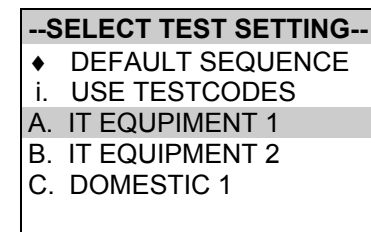


Use the cursor keys to highlight a location name and press enter to select the desired option.

Note

Default settings for Sites and Test Sequences are pre-loaded into the Tester. See 'How to use Setup' to change these settings.

Test Settings



The user has the ability to:-

- Set a specific test sequence by selecting DEFAULT SEQUENCE
- Allow testcodes to determine the test to be carried out
- Use preprogrammed sequences for specific EUTS, e.g IT Equipment.

Selecting either of the first two options allows settings to be altered. Selecting any of the remaining options allows the user to commence immediately with that test.

Press the keyboard shortcut or use the cursor keys to highlight a Test Sequence and press Enter to select the desired option.

Default Sequence

When you first enter this menu all of the previous values are displayed and one of the field descriptions is highlighted.

-----DEFAULT SEQUENCE EDITOR-----			
-			
	OUTPUT LIMIT	DUR	NUM
SOCKET	230V		
VISUAL	YES		1
EARTH BOND	4A	0.10Ω	5 1
INSULATION	500V	0.50MΩ	5 1
SUB LEAKAGE	SKIP		
LEAKAGE	SKIP		
TOUCH LEAKAGE	SKIP		
POLARITY	SKIP		
PERFORM TEST			

Use the cursor keys to highlight a field to be changed and press Enter to select the desired option.

Test Parameter Fields

By selecting one of the test parameter fields from the Default Sequence, a list of options for that field will be displayed:-

-----LEAKAGE-----			
OUTPUT	LIMIT	DURATION	NUMBER
230V	SKIP	2s	1
115V	0.25mA	5s	2
	0.50mA	10s	3
	0.75mA	30s	4
	1.50mA	60s	5
	2.25mA	120s	10
	2.50mA	180s	15
	3.00mA	UL	20
	3.50mA		25
	9.90mA		30

Use the cursor left and right keys to highlight the description, then use the cursor up and down keys to highlight the required setting. Use the cursor left and right keys to change the highlighted field.

Use the Enter key to save the settings and return to the Default Sequence Editor. Repeat this process for each field as appropriate.

Press the red button to abort changes made to the settings and return to the Default Sequence Editor.

To start the test sequence select PERFORM TEST.

Use Testcodes

-----ENTER TESTCODES-----				
	OUTPUT	LIMIT	DUR	NUM
SOCKET	230V			
VISUAL		YES		1
EARTH BOND	4A	0.10Ω	5	1
INSULATION	500V	0.50MΩ	5	1
SUB LEAKAGE		SKIP		
LEAKAGE		SKIP		
TOUCH LEAKAGE		SKIP		
POLARITY		SKIP		
TESTCODE 1: I2F8008032				
TESTCODE 2: R222111111				
PERFORM TEST				

This option bypasses the need to edit a specific test sequence, allowing direct entry of a Testcode through the keyboard or a barcode scanner.

Use the cursor keys to highlight the Testcode to be changed. Press Enter to select that digit. Use the keyboard to change the value of the digit. Press Enter to confirm the change. Press the Red button to abort changes to the selected Testcode.

Use a barcode scanner to enter a Testcode

Use the cursor keys to highlight the PERFORM TEST option and press Enter to commence the test sequence.

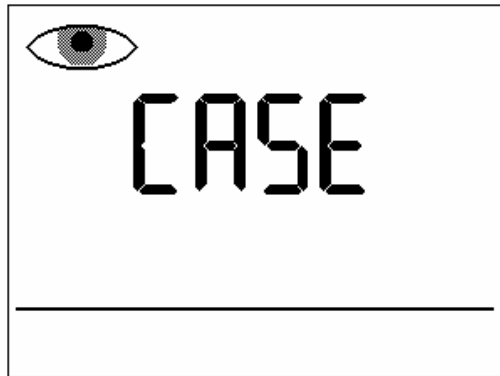
Press the Red button to return to the previous menu.

Perform Test

Use the cursor keys to highlight the Perform Test option and press Enter to perform the test. Pressing the Red Button will return to the previous menu.

The screen will change to the Meter Display (see separate section - How to use the Meter Display for an explanation).

If a visual test is included as part of the test sequence, the following screen will be displayed:-



Use the Pass and Fail fast keys to proceed to the next test. Similar screens will be displayed for Lead and Fuse checks.

After the visual tests, the test sequence will continue into the first actual electrical test of the test sequence.

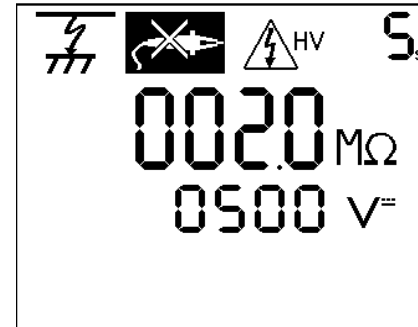
Note

Help screens may be displayed depending on the User Level set. It is possible to stop these appearing by altering the User Level. See EDIT USER LIST OPTIONS.

If an Insulation test has been selected, then once the test has

commenced, a screen similar to the following will be displayed:-

If an external connection e.g. a probe is required, the display will flash the connection icon. The user needs to connect the probe. The test can then proceed when the ENTER button is pressed. At the end of



each test in the test sequence, the display will indicate the result.

All test results are automatically stored.

If any test in the test sequence fails, then the test sequence is aborted and a fail message will be displayed. A Failure Menu may be shown if the option is selected (see Test Options.)

Add Comments

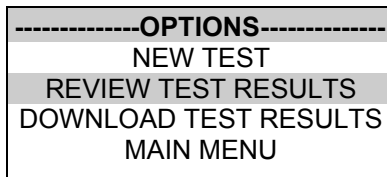
When you have completed a test you can enter comments which will be referenced to the Appliance number.



Use the keyboard to enter comments into the box (4 lines of 20 characters). Press Enter for a new line. To store the comments press the OK fastkey. Your results and comments will now be stored.

Options after Test

The options menu is displayed when an Automatic sequence has been completed.



Use the cursor keys to highlight an option after test and press Enter to

select the desired option.

New Test

Perform a new test.

Review Test Results

Display the results from the test in tabular form:-

<p>-----ABORT OPTIONS----- RESTART TEST RESTART APPLIANCE ABORT TEST ABORT APPLIANCE</p>

APPLIANCE	: A1212654673891		PASS	
SITE	: KITCHEN			
USER	: BOB			
TESTCODE1	: 1027353823			
TESTCODE 2	: 312169743A			
TEST	OUTPUT	LIMIT	RESULT	STATUS
EARTH BOND	25A	0.1ohms	0.99	PASS
EARTH BOND	25A	0.1ohms	0.98	PASS
INSULATION	500V	2Mohms	20.67	PASS
SUB LEAKAGE		7.5mA	<0.25	PASS
LOAD			2.00kVa	

A fast key may illuminate to 'view comments'.

Use the Red button to return to the previous menu.

Download Test Results

This option allows previous test results to be downloaded to either a printer or a computer. The printer option allows a pass/fail label to be printed on a compatible printer - see Chapter 6.

Main Menu

Return to the Main Menu.

Abort Actions

During an Automatic test, pressing the Red Button immediately stops the test in progress and displays the following menu:-

Use the cursor keys to highlight an action following abort and press Enter to select the desired option.

Restart Test

Restart the current test.

Restart Appliance

Restart the first test in the test sequence for the current appliance.

Abort Test

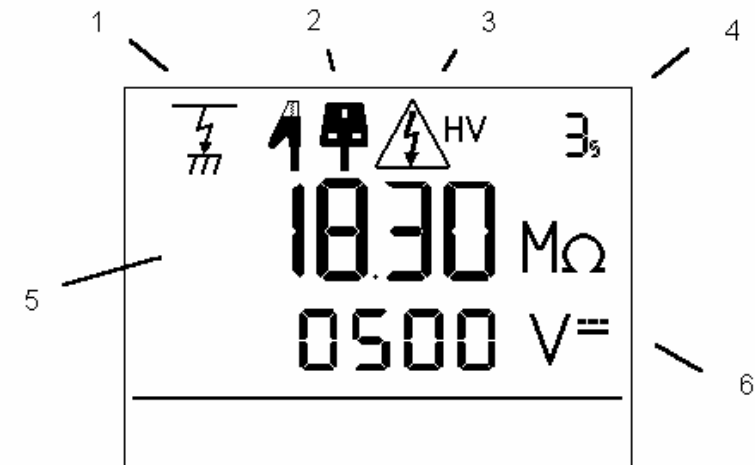
Abort the test without storing a test result and select the next test.

Abort Appliance

Abort the test sequence and select a new appliance.

How to use the Meter Display

The following screen is displayed prior to tests commencing in both Manual Mode and Automatic Mode:-



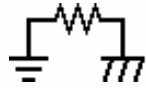
Ref. Number	Function
1	Test Icon
2	Connection Icon
3	Test in Progress Icon
4	Test Duration Counter
5	Primary Display
6	Secondary Display

Test Icon

Indicates the test selected.



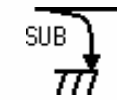
Visual



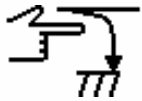
Earth Bond



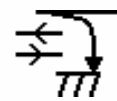
Insulation



Substitute Leakage



Touch Leakage



Leakage



Polarity

Connection Icon

Indicates connection required for external probes.



Earth Bond & Class 2 Insulation probe



No Probe



IEC Lead

Test in Progress Icon

Indicates test in progress with voltage warning.

LV

Low Voltage



High Voltage



Applying Power

Test Duration Counter

Indicates duration of test. This will count down, when the counter reaches zero if the Europa is still taking a measurement the counter will flash.

Primary Display

Indicates test result or pass/fail limit.

Secondary Display

Indicates test output e.g. voltage or current.

How to view Test Results

To view test results stored in memory, use the cursor keys to highlight the View Test Results option on the Main Menu and press Enter to display the following menu:-

```
-----SEARCH FOR RESULTS-----
  APPLIANCE: *
  SITE: *
  LOCATION: *
  USER: *
  TEST STATUS: *
  STORAGE STATUS: NORMAL
  DATE FROM: 01/01/1900 00:00
  DATE TO: 04/03/1999 13:07

  START SEARCH
```

Use the cursor keys to highlight the required search parameters and press Enter to select the desired option.

Appliance Number

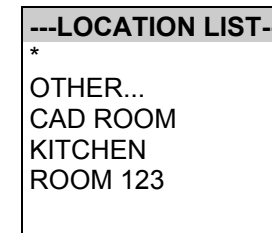
Enter an Appliance number to search for specific results. If the Appliance number field is left blank then the character '*' will be inserted, indicating to search for all of the appliances.

Site Name

```
-----SITE LIST-----
*
OTHER...
SEAWARD
BSX LTD
HSH OFFICES
```

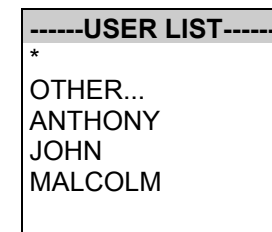
Use the cursor keys to highlight a Site name and press Enter to select the desired option. Select '*' if you wish your search to include all of the sites. Select 'Other' to search for a Site not in the list (this can happen if a Site Name has been modified during testing). If you select 'OTHER...' you are prompted to enter a Site name.

Location Name



Use the cursor keys to highlight a Location name and press Enter to select the desired option. Select '*' if you wish your search to include all of the names. Select 'Other' to search for a Location not in the list (this can happen if a Location name has been modified during testing). If you select 'OTHER...' then you are prompted to enter a Location name.

User Name



Use the cursor keys to highlight a User name and press Enter to select the desired option. Select 'All' if you wish your search to include all of the names. Select 'Other' to search for a User not in the list (this can happen if a User name has been modified during

testing). If you select 'OTHER...' then you are prompted to enter a User name.

Test Status

When Test Status is highlighted use the Enter button to select the option required, every time you press the Enter button a different option will be displayed. This can be PASS, FAIL or '*' which indicates both.

Storage Status

When Storage Status is highlighted use the Enter button to select the option required, every time you press the Enter button a different option will be displayed. This can be NORMAL, DELETED or '*' which indicates both.

Date From

-----DATE FROM-----
01/01/1900 00:00

This option allows the user to search for test results after the selected date. Use the cursor keys to highlight the digit to be changed. Use the (up or down) cursor keys to change the value or enter the digits directly using the keypad. Select OK to store the settings or CANCEL to abort them.

Date To

-----DATE TO-----
01/01/1900 00:00

This option allows the user to search for test results before the

selected date. Use the cursor keys to highlight the digit to be changed. Use the cursor keys to change the value or enter the digits directly using the keypad. Select OK to store the settings or CANCEL to abort them.

Search

After all the search parameters have been set, highlight START SEARCH & press the ENTER BUTTON to search.

Search Result

When you select Start Search the following screen will be displayed. This screen indicates the appliances which match the search criteria.

-----SEARCH RESULTS-----			
APPLIANCE NO	DATE	SITE	STATUS
A1212654		KITCHEN	PASS
A1541276		KITCHEN	FAIL
A9850398		WORKSHOP	PASS
A4834798		OFFICE	PASS
A9039274		OFFICE	PASS

You can delete the highlighted appliance by pressing the delete key.

Appliance Test Results

How to perform Manual Tests

It is possible to view the results obtained for a certain appliance by highlighting the appliance number and pressing the ENTER button.

APPLIANCE	: A1212654673891	PASS		
SITE	: KITCHEN			
USER	: BOB			
TESTCODE1	: 1027353823			
TESTCODE 2	: 312169743A			
TEST	OUTPUT	LIMIT	RESULT	STATUS
EARTH BOND	25A	0.1ohms	0.99	PASS
EARTH BOND	25A	0.1ohms	0.98	PASS
INSULATION	500V	2Mohms	20.67	PASS
SUB LEAKAGE		7.5mA	<0.25	PASS
LOAD			2.00kVA	PASS

A fast key may illuminate to 'view comments'

Use the Red button to return to the previous menu.

How to perform Manual Tests

Manual mode provides the user with direct access to the tests. In this mode individual tests can be selected and performed. Appliance numbers, sites, users and testcodes can still be assigned to appliances if required, though this is not essential.

Entering Manual Mode

Use the fast key to select Manual Mode from the Main Menu.

Note

To store tests in memory from Manual mode you must first select Create Appliance No., perform the tests required from the EUT. When you have completed the required tests select Enter Comments/Save Results, upon leaving this option the Europa will now store the results. Note that Enter Comments option is not displayed until there is something to store.

The manual tests and other options available are shown in the table below:-

-----MANUAL TEST SELECTION-----
A..CREATE APPLIANCE NO.
6..CHANGE 230V/115V OP SOCKET
1..VISUAL CHECK
2..EARTH BOND TEST
3..INSULATION TEST
4..SUB LEAKAGE TEST
6..LEAKAGE TEST
7..TOUCH LEKAGE TEST
8..POLARITY TEST

Press the appropriate key to select a test or option.

note

In some circumstances the numbers of the tests are displayed in manual mode seem to be out of sequence. This is intentional since the numbers relate to types of tests as apposed to the actual order in which they appear on the screen. The sequence will appear to change if the model tester you are using does not support certain tests. Thus a flash test is numbered 5, but the Europa does not support the flash test and so the choices shown above miss out test number 5.

Create Appliance Number

This allows all manual tests performed to be stored against the appliance number until the appliance number is changed.

Use the keyboard or a compatible Barcode Reader to enter an Appliance Number.

---ENTER APPLIANCE DETAILS---
APPLIANCE :
SITE : SEAWARD
LOCATION : CAD ROOM
OK

Note

See Chapter 4 for tips on using barcodes.

If you need to change the current Site use the cursor keys to highlight SITE and press Enter to change the Site Name.

-----SELECT SITE-----
SEAWARD
BSX LTD
HSH OFFICES

Use the cursor keys to highlight a Site name and press Enter to select the desired option.

If you need to change the current Location use the cursor keys to highlight LOCATION and press Enter to change the Site Name

---SELECT LOCATION---
-
WORKSHOP
CAD ROOM
KITCHEN

Use the cursor keys to highlight a Location name and press Enter to select the desired option.

Note

Default settings for Sites and Test Sequences are pre-loaded into the Tester. See 'How to use Setup' to change these settings.

Change Output Socket

Press the diamond key to toggle between 230V and 115V output sockets. You may need to use the 115V adapter when changing voltages

Use the keyboard to enter comments into the box. Press Enter for a new line. To store the comments press the OK fastkey. Use the Red button if you do not want to store the comments.

Select Manual Test

Use the appropriate number key from the table to select a specific test or use the cursor to highlight the desired option.

Performing a Manual Test

After selecting the appropriate test the tester displays a screen from which you can set test parameters.

The user can change an individual setting when the icon is shown inverted. Use the left and right cursor keys to highlight a field on the display. Then use the up & down cursor keys to change the variable in the selected field.

When an icon is shown inverted use the left and right cursor keys to highlight a field on the display. Then use the up and down cursor keys to change the variable in the selected field.

When the connection icon is flashing you cannot change any settings.

How to perform Manual Tests

note

You cannot change the settings for a test if you have performed that test from within an appliance sequence. For example after selecting Create Appliance No you can only change the Earth Bond settings on the first Earth Bond test, all subsequent Earth Bond test will conform to the same settings.

Press the Enter button to start the test.

Press the Red button to abort the test at any time.

Note

In manual mode you will not get Abort Options, the test will simply stop the test and revert to the Meter display. The aborted test will not be stored.

If an Appliance Number has been created, the test result will be stored under the entered number. To store tests to memory choose Enter Comments / Save Results.

Enter Comments/Save Results

When you have completed a test you can enter comments which will be referenced to the Appliance number.

-----ENTER COMMENTS-----

How to download Data

To download results stored in memory, use the cursor keys to highlight the Download Data option from the Main Menu and press Enter to display the following menu:-

```
-----DOWNLOAD OPTIONS-----
DESTINATION      : GENERIC PRINTER
OUTPUT CONNECTION : RS232
BAUD RATE        : 9600

DOWNLOAD FORMAT  : CERTIFICATE
OPTION           : ONE PER PAGE

                    OK
```

Use the cursor keys to highlight the required parameters. Use repeated presses of the enter button to show the desired options for destination, output connection and baud rate.

Destination

This gives the option of selecting the device to send the test results, the available options are:

PC

Download the test results to a computer using a compatible software package.

GENERIC PRINTER

Download the test results to a compatible serial or parallel (using the serial to parallel converter) printer.

ROLL PRINTER

Download the results to a compatible Roll Printer.

Output Connection

Selects the tester output connection to which the results are to be sent, available options are:

RS232

This sends the data to the RS232 serial port (9 way D connection on the tester) for connection using a compatible serial cable.

INFRA-RED

This option sends the results to the IrDA port for download to compatible devices (see Chapter 4).

Baud Rate

If available this option selects to the Baud Rate at which the data is sent, possible values are 9600, 19200 or 28800.

Download Format

This field shows the format choices available depending upon the destination selected.

For downloading to a PC the user has the option of sending data in a PATS+ format, compatible with Seaward PATS+ software, SSS format - Seaward super system, compatible with Seawards PATS Win software, certificate - downloads results in non-ASCII certificate format.

In PATS+ format the user has the option to download by site (send site) or to download by user (send user). This will be truncated to 10 characters.

For downloading to a generic A4 printer the user has the option of sending data as a certificate, or a list, or as pass/fail labels. In the certificate format the user has the option to produce one certificate per page or to produce continuous printouts.

For downloading to a roll printer, including 'till roll' and thermal printers the user has the option of sending data as a continuous list or as pass/fail labels. When using a compatible thermal roll printer the pass/fail labels will produce appliance number and in a number and barcode format. However, the restrictions of paper width means that appliance numbers representing more than 12 digits cannot be printed and a numbered label will print instead. Testcodes over 12 and upto 15 digits can be accommodated since these are displayed as two lines.

Use repeated presses of the enter button to show desired settings for download format. If appropriate the option field will illuminate.

Use repeated presses of the enter button to show desired settings.

When the download options are as you wish highlight the OK field and press the enter button to display the following menu:-

```
-----SEARCH FOR RESULTS-----
APPLIANCE: *
SITE: *
LOCATION: *
USER: *
TEST STATUS: *
STORAGE STATUS: NORMAL
DATE FROM: 01/01/1900 00:00
DATE TO: 04/03/1999 13:07

START SEARCH
```

Use the cursor keys to highlight the required search parameters and press Enter to select the desired option.

Appliance Number

Enter an Appliance number to search for specific results. If the Appliance number field is left blank then the character '*' will be inserted, indicating to search for all of the appliances.

Site Name

```
-----SITE LIST-----
*
OTHER...
SEAWARD
BSX LTD
HSH OFFICES
```

Use the cursor keys to highlight a Site name and press Enter to select the desired option. Select '*' if you wish your search to include all of the sites. Select 'Other' to search for a Site not in the list (this can happen if a Site Name has been modified during testing). If you

select 'other' a global search of all sites is performed and the results appear in a new Site list. Use the cursor keys to highlight a Site name from this new list and press Enter to select the desired option

Note

If the list contains more sites than the unit can display then use the cursor keys to scroll through the list.

Location Name



Use the cursor keys to highlight a Location name and press Enter to select the desired option. Select "*" if you wish your search to include all of the names. Select 'Other' to search for a Location not in the list (this can happen if a Location name has been modified during testing). If you select 'other' a global search of all names is performed and the results appear in a new Location list. Use the cursor keys to highlight a Location name and press Enter to select the desired option

Note

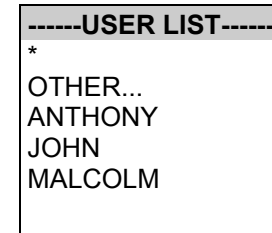
If the list contains more sites than the unit can display then use the cursor keys to scroll through the list.

User Name

Use the cursor keys to highlight a User name and press Enter to select the desired option. Select 'All' if you wish your search to include all of the names. Select 'Other' to search for a User not in the list (this can happen if a User name has been modified during testing). If you select 'other' a global search of all names is performed and the results appear in a new User list. Use the cursor keys to

highlight a User name and press Enter to select the desired option

Note



If the list contains more sites than the unit can display then use the cursor keys to scroll through the list.

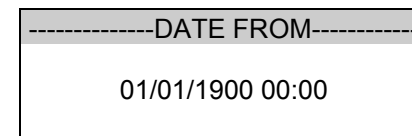
Test Status

When Test Status is highlighted use the Enter button to select the option required, everytime you press the Enter button a different option will be displayed. This can be PASS, FAIL or '*' which indicates both.

Storage Status

When Storage Status is highlighted use the Enter button to select the option required, everytime you press the Enter button a different option will be displayed. This can be NORMAL, DELETED or '*' which indicates both.

Date From



This option allows the user to search for test results after the selected date. Use the cursor keys to highlight the digit to be changed. Use the (up or down) cursor keys to change the value or enter the digits

How to print Barcode Labels and Testcodes

directly using the keypad. Select OK to store the settings or CANCEL to abort them.

Date To

-----DATE TO-----
01/01/1900 00:00

This option allows the user to search for test results before the selected date. Use the cursor keys to highlight the digit to be changed. Use the cursor keys to change the value or enter the digits directly using the keypad. Select OK to store the settings or CANCEL to abort them.

Search

After all the search parameters have been set, connect the appropriate printer or device. Highlight START SEARCH & press the ENTER BUTTON to search and download process.

If there are problems downloading e.g. due to interfacing problems, then after a short delay, the following error message appears:-

Press the red button to return to the search menu. On completion of

-----WARNING-----
DOWNLOAD FAILED
CHECK CONNECTIONS
AND TRY AGAIN

successful downloading, the tester returns to the search for results menu. The user can then conduct on other search or press the red button to return to the main menu.

How to print Barcode Labels and Testcodes

The Europa is capable of printing barcode labels in conjunction with a compatible thermal printer (see chapter 6).

To print barcode testcodes

To print barcode test codes select setup from the main menu and select test settings from the setup menu. From the select test settings menu chose the desired test eg HOUSEHOLD CLASS 1. Attach the compatible printer to the port and from the test settings editor highlight the PRINT TESTCODE option and press enter.

To Print Barcode Pass/Fail Labels

To print barcode pass/fail labels it is necessary to carry out an actual test. (see how to perform automatic tests.) After a test is complete and the results stored in memory it is possible to download results to a thermal printer (see how to download results) and print pass/fail labels.

Note

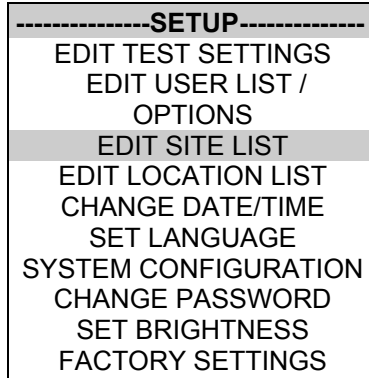
Restrictions of paper width means that representing more than 12 digits cannot be printed and a numbered label will print instead.

How to use Setup

To set up the Tester, use the cursor keys to highlight the Setup option

on the Main Menu and press Enter to display the following menu:-

From this menu you can change the way the Tester will operate and also change user levels and sites. Use the cursor keys to highlight a



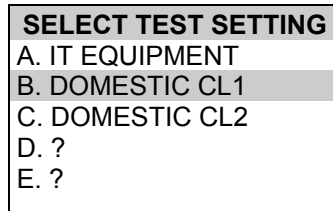
function and press Enter to select the desired option.

Edit Test Settings

This allows the user to add, modify, remove or confirm test settings that can then be selected during automatic testing.

Also see Change Password.

Use the cursor keys to highlight a Test Setting and press Enter to enter the Test Settings Editor:-



Test Settings Editor

The Test Settings Editor allows the test sequence for the selected test to be examined and changed if required:-.

-----DEFAULT SEQUENCE EDITOR-----				
-				
	OUTPUT	LIMIT	DUR	NUM
SOCKET	230V			
VISUAL		YES		1
EARTH BOND	4A	0.10Ω	5	1
INSULATION	500V	0.50MΩ	5	1
SUB LEAKAGE		SKIP		
LEAKAGE		SKIP		
TOUCH LEAKAGE		SKIP		
POLARITY		SKIP		
NAME: IT EQUIPMENT				
TESTCODE 1: I0G2000122				
TESTCODE 2: R222111111				
PRINT TESTCODES				
STORE SETTINGS				

Use the cursor keys to highlight a field to be changed and press Enter to select the desired option.

Name

Each Sequence is given a name, this is to help the user when selecting Sequences during automatic testing. When Name is highlighted press the Enter button, then use the keyboard to enter a new name for the Test Sequence (of up to 15 characters) and press Enter to confirm.

Test Parameter Fields

By selecting one of the test parameter fields from the Test Settings Editor, a list of options for that field will be displayed:-

-----INSULATION-----			
O/P	LIMIT	DUR	REP
250V	0.5MΩ	2s	0
500V	1.0MΩ	5s	1
	2.0MΩ	10s	2
	7.0MΩ	30s	4
	10.0MΩ		5
	50.0MΩ		10
	SKIP		15
			20
			25
			30
			UL

When you first enter this menu all of the previous value and one of the field descriptions are highlighted. Use the cursor left and right keys to highlight the description, then use the cursor up and down keys to highlight the required setting. Use this process for each description.

Use the Enter button to save the settings and return to the Test Settings Editor. Press the Red button to abort changes made to the settings and return to the Test Settings Editor.

Testcodes

Use the cursor keys and Enter to select one of the Testcode fields.

A Testcode can be entered manually or through a compatible barcode scanner, reader or wand (see How to use a Barcode Scanner).

The Europa has two testcodes, when entering a Seaward PAT testcode they will automatically translated into Europa testcodes.

Store Settings

Use the cursor keys to highlight the Store Settings option and press Enter to save the settings and return to the previous menu. Pressing the Red Button will abort all of the changes made and return to the previous menu.

Print Testcodes

The testcodes can be printed (using a compatible printer - see Chapter 6).

Use the Enter Button to start the print. The following message will be displayed:-

```
PRINTING TESTCODES
PRESS THE RED BUTTON TO
ABORT
```

On completion of downloading, the Test Settings Editor menu is displayed.

If there are problems downloading e.g. due to interfacing problems, then after a delay, the following error message appears:-

```
-----WARNING-----
DOWNLOAD FAILED
CHECK CONNECTIONS
AND TRY AGAIN
```

Press the Red Button to return to the Test Settings Editor menu.

Edit User List / Options

```
-----USER LIST-----
-
ANTHONY
JOHN
MALCOLM
```


Use the cursor keys to highlight a User name and press Enter to select the desired option:-

----- EDIT USER SETTINGS -----
NAME: JOHN
USER LEVEL: ADVANCED
STARTUP MODE: AUTO
BEEP ON KEYPRESS: YES
BEEP ON TESTS: YES
BEEP ON BARCODES: YES
OK

Note

If you change the name of the user during testing all of the previous tests will still be referenced to the old user name, this gives unlimited amounts of users within memory.

To change the user name highlight Name and press the Enter button.

Use the cursor keys to highlight options that can be customised for each user and press Enter to select the desired option.

User Level

Use the cursor keys to highlight a user level and press Enter to select the desired option.

Regular User

Selects the user level as a regular user. This provides an average level of help information and additional warnings and prompts

Advanced User

Selects the user level as an advanced user. This provides a minimum level of help information and additional warnings and prompts

Startup Mode

Use the cursor keys to highlight a test mode on startup and press Enter to select the desired option.

Automatic Mode

The Tester will start up in Automatic Mode, with the Tester displaying the Main Menu.

Manual Mode

The Tester will start up in Manual Mode, with the Tester displaying the Manual Test Selection Menu.

Beep on Key Press

Use the cursor keys to highlight a buzzer option and press Enter to select the desired option.

This option will beep every time a key is pressed.

Beep on Tests

Use the cursor keys to highlight a buzzer option and press Enter to select the desired option.

This option will beep whenever the High Voltage Test in Progress icon is displayed or a test has failed.

Beep on Barcodes

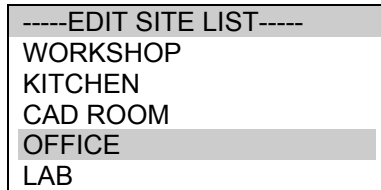
Use the cursor keys to highlight a buzzer option and press Enter to select the desired option.

This option will beep whenever a barcode has been received.

Saving User Settings

In the Edit user settings menu, highlight OK and press the Enter button. The user settings will then be saved.

Edit Site List



Use the cursor keys to highlight a Site name and press Enter to select the desired option.

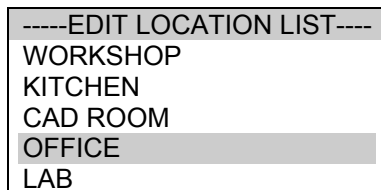


Note

If you change the name of the site during testing all of the previous tests will still be referenced to the old site name, this gives unlimited amounts of sites within memory.

If you chose to edit an existing site the name of the site will be shown in the box. If you chose to edit an empty box (signified by a ?), the box will be empty. Use the keyboard to enter the name of the site and press Enter to return to the previous menu.

Edit Location List



Use the cursor keys to highlight a Location name and press Enter to select the desired option.

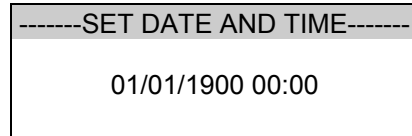


Note

If you change the name of the site during testing all of the previous tests will still be referenced to the old site name, this gives unlimited amounts of sites within memory.

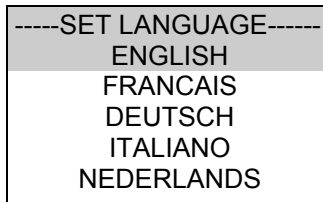
If you chose to edit an existing site the name of the site will be shown in the box. If you chose to edit an empty box (signified by a ?), the box will be empty. Use the keyboard to enter the name of the site and press Enter to return to the previous menu.

Change Time/Date



This option allows the user to change the Date and Time. Use the left and right cursor keys to highlight the digit to be changed. Use the up and down cursor keys to change the value or enter the digits directly using the keypad. Select OK to store the settings or CANCEL to abort them. To store the new setting you must return to the MAIN MENU.

Set Language



Use the cursor keys to highlight a language and press Enter to select the desired option.

Note

If the selected language is unavailable, a message will be displayed.

System Configuration

The Test Settings are included to cover the wide range of options which may be country or company specific.

-----SYSTEM CONFIGURATION-----	
SUB LEAKAGE	0%
POWER POLARITY	INPUT & REVERSED
ON TEST FAILURE	END APPLIANCE
ROLL PRINTER	A-P860B
DATE AND TIME	UNPROTECTED
USER LIST	UNPROTECTED
APLNCE & CMNTS	FULL LENGTH
OK	

Sub Leakage

This option allows you to set the Sub Leakage value indicated 10%, 6% or 0% high, depending upon national legislation or best practice.

Power Polarity

The Power Polarity option will allow the tester to perform the power tests in one of three ways.

Input Polarity:- perform the power tests with the same mains polarity as the Europa is powered.

Auto-corrected:- perform the power tests with the mains correct polarity even if the Europa is powered from a socket which has the mains polarity reversed.

Input & reversed:- this option will perform two power tests for every one selected, one with the correct mains polarity and one with the reverse mains polarity.

On Test Failure

This gives you the option of having a menu for a failure within an automatic sequence. This menu will give you the option of retrying a failed test or appliance.

Roll Printer

This allows the user to define the thermal printer to be used with the Europa. Seaward recommended option is SEAWARD (283A954).

Date & Time

This allows the user to password protect the date and time. An existing password must be setup before this option can be used.

User List

This allows the user to password protect the User List. An existing password must be setup before this option can be used.

ApInce & Cmnts

This allows the user to limit the Appliance number and Comments lines to 10 digits. When limited to 10 digits the Europa can be downloaded to a wider range of software. See Tips and Troubleshooting for further details.

Change Password

It is possible to Password protect the Test Sequence Editor and the System Configuration.

If you currently do not have password protection you will be asked to enter a new password twice, once for confirmation.

If you currently do have password protection then you will be asked for the old password before entering a new one, again you will be asked for the new password twice.

To clear the password protection simply press Enter when asked for the new password. A warning will show that no password is in place.

Set Brightness

You can now set the Brightness of the display. Use the cursor keys to change the Brightness, once the Brightness is set press the Green button to accept the changes. Press the Red button to abort any changes made.

Factory Settings

It is possible to reset the Europa to the settings which were configured from new. This option will first ask you if you are sure, select Yes to reset or No to abort.

How to use the Memory

To use the memory tests and functions, use the cursor keys to highlight the Memory Options option on the Main Menu and press Enter to display the following menu:-

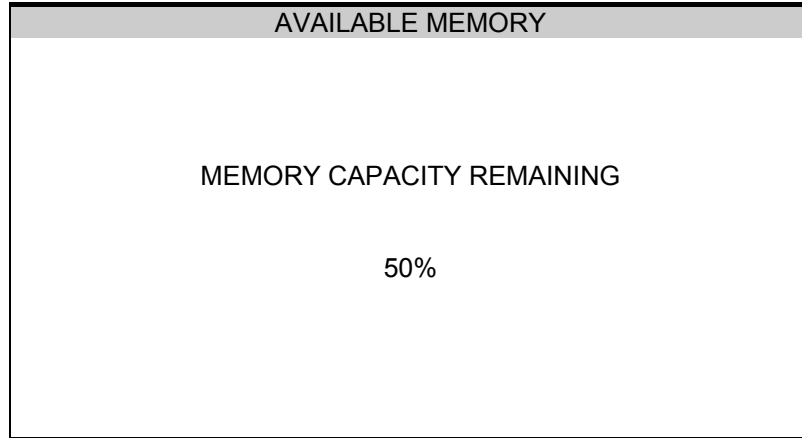
```
-----MEMORY OPTIONS-----
```

VIEW MEMORY USED
PERFORM MEMORY TEST
DELETE SINGLE APPLIANCE
CLEAR RESULTS MEMORY
CLEAR TESTFILE MEMORY

Use the cursor keys to highlight a test or function and press Enter to select the desired option.

View Memory Used

The Tester allows the user to see how much of the results memory is being used. The following bargraph of the memory remaining is displayed:-



Perform Memory Test

Once the perform memory test option is highlighted press the enter button.

The memory test checks all of the appliance results against their checksums. If the test result is a pass then no action is taken. If any tests fail then the Memory checksum requires updating. Use the cursor keys and press Enter to choose an action if corrupted tests are found.

Note

The memory checksum is the sum of all of the memory excluding display data, registers and deleted tests.

Delete Single Appliance

A rectangular display window with a black border. The top line contains the text "-----DELETE APPLIANCE-----". The second line contains the text "APPLIANCE NUMBER" followed by a grey rectangular input field. The bottom line is blank.

Enter the Appliance number to delete a single appliance and press Enter .

A warning 'Are You Sure ?' prompt will appear. Press the No fast key to return to the previous menu or press the Yes fast key to perform the delete operation and return to the previous menu.

Note

Deleting Appliances in this way will delete all of the matched appliances across all of the Sites and Locations.

When a single appliance is deleted it is not removed from memory but hidden from the user. This test is still resident in memory and is taking up memory space, this test can be reviewed / downloaded at a later date. Since the test is still resident in memory the View Memory Capacity indicates there are results stored. In this situation to remove all resident tests select clear results memory.

How to upload test details to your Europa

To upload test details to the Europa memory first connect the serial port of the Europa to the appropriate port on your PC using a serial-download lead (9-9way or 9-25 Way). Please see the optional accessories section of this manual for part numbers.

From the main menu on the tester use the cursor keys to select REMOTE MODE, the tester is now ready to accept download data. Follow the instructions supplied with your results recording software to communicate with the tester. Once the communication is in process the tester will show a count of tests being transferred. The software and Europa will display a message to say that the transfer is complete. Once complete press the ABORT key and return to the MAIN MENU. Disconnect the serial download lead and the Europa can be used as normal.

Clear Results Memory

This option will delete all of the appliances currently stored in memory and should be used carefully!

Note

Users will be asked whether they are sure about performing this action.

A warning 'Are You Sure ?' prompt will appear. Press the No fast key

How to change the User

to return to the previous menu or press the Yes fast key to perform the delete operation and return to the previous menu.

Clear Upload Memory

This option will delete all of the appliance codes that have been uploaded from an external computer and should be used carefully!

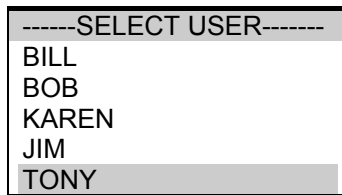
Note

Users will be asked whether they are sure about performing this action.

A warning 'Are You Sure ?' prompt will appear. Press the No fast key to return to the previous menu or press the Yes fast key to perform the delete operation and return to the previous menu.

How to change the User

To change the User, use the cursor keys to highlight the Change User option on the Main Menu and press Enter to display the following menu:-



Use the cursor keys to highlight the User and press Enter to select the desired option.

How to use Help

The Tester is provided with an on-line help function which can be called up at during the test screens by pressing the Help fast key.

Each test will have three or four help pages depending on connection information.

Help Provided to the User

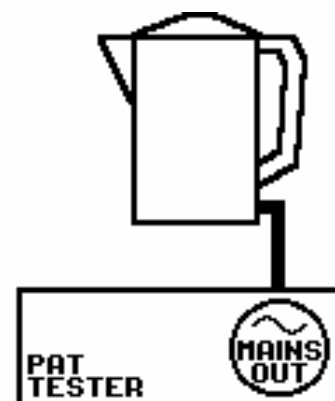
The Help function provides the following information:-

Description of Test

The first help page shown contains information on the particular test, including its icon and a description of the purpose of the test.

How to Perform Tests

The second page of information describes how the Tester performs the test. A diagram showing how to connect the Tester to the EUT is included. An example for the Insulation test is shown below:-



A description of how to connect the test leads and perform the test is provided in a step-by-step format.

Note:

This topic will cover one or two pages depending on the connection options available (Insulation and Flash can be Class 1 or Class 2). Each connection option will have a new page of information.

Why tests fail

The final page of information provides guidance on why a test may fail e.g. connection problems. This includes a step by step check list to ensure all of the connections are correct and secure.

The effect of User Levels during Test Sequences

There are two possible user levels: Novice, and Advanced.

Note

The user level for a new user is set to Novice.

Novice User Level

When the user level is set to Novice Level, the help information is displayed before every new test

Press the Enter key to continue the sequence.

Advanced User Level

When the user level is set to Advanced Level, no help information will be shown before a test. Use the Help/Information key for help information if required at any time.

Chapter 4 Tips & Troubleshooting

Power -On Self tests:

When the tester is powered on, a number of messages can possibly appear as the tester performs safety tests on itself and the mains power supply.

If a voltage greater than 30V is detected on the neutral input line or the earth is missing then the following message will be displayed.

-----WARNING-----
LIVE AND NEUTRAL REVERSED.
PRESS ANY KEY TO CONTINUE

Check for incorrect wiring on supply.

The next test will check for an earth connection. If there is no Earth connection, the following message will appear.

-----WARNING-----
POSSIBLE DISCONNECTED,
FLOATING OR ISOLATED EARTH.
CHECK INPUT EARTH BEFORE
PROCEEDING.
PROCEED ONLY IF YOU KNOW THE
INPUT EARTH IS ISOLATED.
PROCEEDING WITH AN INCORRECT
EARTH MAY GIVE INCORRECT TEST
RESULTS.

Check for incorrect wiring on supply.

Sequence Warning Faults

The Tester will fail the earth check if it is being supplied with a balanced supply (eg. isolating transformer) since it will detect phase voltage on both L and N supply connections. Only continue if certain that the supply is balanced and the earth on the Tester connection is secure.

If all the above is checked the Europa maybe faulty contact Seaward for repair

The unit then completes an internal check. If any faults are found then the following message will be displayed:-

```
-----WARNING-----  
INTERNAL RELAY FAULT.  
CANNOT PROCEED.
```

The Europa is faulty and should be returned to Seaward for Repair

Sequence Warning Faults

If you enter a testcode which involves tests the Europa cannot perform then you may see one of the following warnings.

```
-----WARNING-----  
THE SELECTED TESTCODES SPECIFY  
THAT LEAKAGE, LOAD AND/OR  
POLARITY TEST SHOULD BE  
PERFORMED.  
THIS IS NOT POSSIBLE ON THE  
EUROPA WHEN THE 115V ADAPTOR  
IS SELECTED.  
THESE TEST TYPES WILL BE  
SKIPPED. PRESS START BUTTON TO  
CONTINUE
```

-----WARNING-----
THE SELECTED TESTCODES SPECIFY
THAT A FLASH TEST SHOULD BE
PERFORMED.
THIS IS NOT POSSIBLE ON THE
EUROPA.
THE FLASH TEST WILL BE SKIPPED.
PRESS THE START KEY TO
CONTINUE.

Safety Tests during operation

The Tester performs self-tests during normal operation. An internal earth bond test and a low voltage test are performed prior to applying mains power to any EUT (including Load/Leakage and Touch Leakage tests). If the internal earth bond test is failed, the following message will be displayed:-

-----WARNING-----
INTERNAL RELAY FAULT.
CANNOT PROCEED.

If this message appears, the Europa is faulty and requires repair.

If the low voltage test fails, then either of the following warnings will be displayed:-

-----WARNING-----
APPLIANCE MAY BE SHORT CIRCUIT
PRESS THE ENTER BUTTON IF SAFE
PRESS THE RED BUTTON TO ABORT

-----WARNING-----
FUSE MAY BE OPEN CIRCUIT OR
PRESS THE ENTER BUTTON IF SAFE
PRESS THE RED BUTTON TO ABORT

These messages mean that the appliance under test is switched off or the fuse may be open circuit, or it maybe possible that the appliance under test will draw more than 18A and could damage the Europa. User discretion is required. If in doubt do not test and seek advice.

Temperature monitoring

The tester is provided with internal temperature monitors to ensure sensitive components are not overheated. High rates of testing may cause this situation, especially with long Earth Bond tests. Setting Earth Bond test times to 2 secs will increase operating time. If the following message appears, leave the tester to cool down before pressing Enter to continue testing.

WARNING

**THE TEST HAS BEEN ABORTED BECAUSE THE APPLIANCE
TESTER BECAME TOO HOT. ALLOW THE UNIT TO COOL
BEFORE STARTING PRESS ENTER BUTTON TO CONTINUE**

Multiple Earth connections:

In general, multiple earth connections to an EUT (e.g. water pipe connections to a water heater) can cause difficulties in measurement. This has previously needed the additional earth connections to be isolated.

The Europa tester is capable of testing earth connections in the presence of additional earth paths. This is done automatically by performing a point to point measurement of the earth connection, and measurement of the differential leakage current, rather than the earth lead current. Measurements are thus assured without special precautions.

Barcodes

Barcode Scanner Specification

The Europa Tester can be used with barcodes and barcode scanners, readers or wands compatible with the Seaward PAT2000i. These connect to the serial (RS232) connector. The required configuration is as follows:-

Baud Rate:	9600
Start Bits:	2
Data Bits:	8
Stop Bits:	2
Parity:	None
Inter-character Delay:	20ms

When to use a Barcode Scanner

Barcodes can be scanned at the following points:-

- Entering a Testcode as part of an Automatic Test
 - Test Setting Editor
 - Use Testcodes
- Entering an Appliance number

Interfacing

The Tester provides two interfacing ports:-

Serial Port - for connection to a PC, printer or Barcode Reader

To avoid any problems during download, ensure that leads are undamaged and correctly wired.

The Connector pinouts for Serial port are shown below:-

IrDA - for data transmission via infrared. For PC's and Printers without an infrared receiver an adaptor is available. See accessories on Chapter 6.

Parallel - The Europa features a serial port. However a serial to parallel adaptor is available to allow interface with parallel ports. See accessories in Chapter 6.

Downloading to Computer Software

The Europa can be setup to be backward compatible with various software packages. The APLNCE & CMNTS option can be found in SYSTEM CONFIGURATION in the SETUP menu.

Note for PATS/PATS+ for DOS Users

Please note that if the version you are using is earlier than 5.4 then it is not millenium compatible and therefore requires upgrading. Contact on 0191 586 3511.

If you are using version 5.4f or later then you can set APLNCE & CMNTS to FULL LENGTH to obtain the 15 digit Appliance Number and 20 digit comments lines.

If you are using an earlier version than 5.4f the leave APLNCE & CMNTS set to 10-DIGIT RESTRICTION.

Note for PATS+ for Windows Users

Please note that you should be using version 1.03.15 or higher. This version allows you to set the APLNCE & CMNTS to FULL LENGTH to obtain the 15 digit Appliance Number and 20 digit comments lines.

If you are not using the latest version please contact your supplier for a free update.

Note for PATSwin Users

Please note that you should be using version 1.05 or higher. This version allows you to set the APLNCE & CMNTS to FULL LENGTH to obtain the 15 digit Appliance Number and 20 digit comments lines.

If you are not using the latest version please contact Seaward on 0191 586 3511 for a free update.

Please note that when using PATSwin it only accepts the first 3 results of any test type. This may lead to a FAILED appliance being indicated as a PASS. For example if the fourth Earth Bond is a fail, PATSwin will only record the three results, these may all be passes.

Note for PATSwin Users

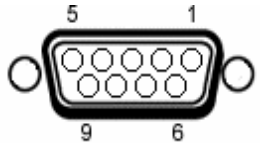
The Europa has only been tested with Powersuite version 1.4. If you are using Powersuite then leave the APLNCE & CMNTS set to 10-DIGIT RESTRICTION.

When downloading use the Download Wizard and select PAT 2000iee as the tester to download.

Please note that when using PATSwin it only accepts the first 3 results of any test type. This may lead to a FAILED appliance being indicated as a PASS. For example if the fourth Earth Bond is a fail, PATSwin will only record the three results, these may all be passes.

Serial Port

The serial port uses a standard 9-way D-type connector



Pin	Description
1.	N.C.
2.	RX
3.	TX
4.	DTR
5.	0V
6.	N.C.
7.	0V
8.	N.C.
9.	+5V

Baud Rate: 9600, 19200, 28800 (selectable)

Start Bits: 2

Data Bits 8

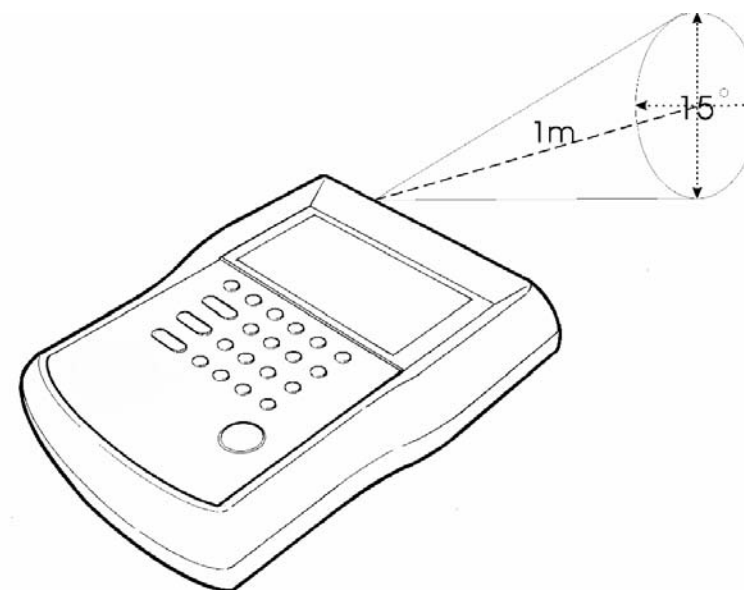
Stop Bits: 2

Parity: None

Inter-character Delay: 20ms

IrDA Port

The receiving device should be placed at a distance of not more than 1m and within 30° of the Europa IrDA LEDs as illustrated below.



Baud rate:	9600
Start Bits:	2
Data Bits:	8
Stop Bits:	2
Parity:	None

Note: Remove any IEC leads from the tester before downloading using the IrDA port.

Quick Reference

Editing the date in all modes

On delivery of the Europa it is necessary to ensure that the correct time and a date are stored. Once stored the time/date is retained in memory and does not need to be entered again. To edit the date: from the MAIN MENU select SETUP, select, CHANGE TIME/DATE, use the cursor keys to highlight the digit to be changed. Press ENTER to confirm the change. To store the changed time/date setting return to the MAIN MENU. The unit will then display the message STORING SYSTEM DATA.

Entering a User Name

On delivery of Europa it is necessary to ensure that a user name(s) is stored. To edit the user list: from the MAIN MENU select SETUP, select EDIT USER LIST, use the cursor keys and select USER 1, a screen will appear "EDIT USER NAME" use the keyboard to type in the desired name and press ENTER to return to the previous menu.

Editing User Level and Novice Mode

The Europa is delivered with a default setting of novice user level. To change this setting: from the MAIN MENU select SETUP, select USER OPTIONS, select USER LEVEL, select the desired level by selecting either REGULAR or ADVANCED. To store the changed user level setting return to the MAIN MENU. The unit will then display the message STORING SYSTEM DATA.

Storing Appliance Test Results in Automatic mode

The Appliance Test Results will not be stored until you leave the OPTIONS MENU, upon leaving this menu the unit will display the messages STORING RESULTS then SAVED OK. Your results have now been stored.

Storing Appliance Test Results in Manual mode

The Appliance Test Results will not be stored until a Manual Appliance Sequence has been completed. To do this firstly press A, this will prompt you for an Appliance number, enter this and press ENTER twice. Perform the tests required then press C, this will prompt you to enter comments, select SAVE COMMENTS/RESULTS and press ENTER. The unit will then display the messages STORING RESULTS then SAVED OK. Your results have now been stored.

Storing System Data

System Data consists of everything changed from within the SETUP MENU. To store the System Data return to the MAIN MENU from the SETUP MENU. The unit will then display the message STORING SYSTEM DATA.

Waiting for a Yes/No response

When you are prompted to respond with YES or NO you must use the fastkeys under the display.

Using Symbols in Text Fields

Although there is an option to use non-ascii symbols as Appliance numbers, Site & Location descriptions, User names and comments does not guarantee that your computer software will support them. If you are unsure avoid using symbols.

10 Digit Restriction

When you first receive you Europa the Appliance and Comments will be set to '10 Digit Restriction'. If you are using compatible software then this option can be set to 'Full Length'. When set to 'Full Length' the maximum Appliance length is extended to 15 characters while the maximum line for the comments is extended to 20 characters per line.

Chapter 5 Maintaining the Tester

Cleaning the Tester

The Tester case can be cleaned with a damp cloth, with if necessary, a small amount of mild detergent. Prevent excessive moisture around the socket panel or in the lead storage area.

Do not allow liquid inside the Tester, or near the sockets panel. Do not use abrasives, solvents, or alcohol.

If any liquid is spilt into the Tester case, the Tester should be returned for repair, stating the cause of the defect.

User Maintenance

The Tester is a rugged quality instrument. However, care should always be taken when using, transporting and storing this type of equipment. Failure to treat the product with care will reduce both the life of the instrument its reliability.

If the Tester is subject to condensation, allow the Tester to completely dry before use.

- Always check the Tester and all test leads for signs of damage and wear before use.
- Do not open the Tester under any circumstances.
- Keep the instrument clean and dry.
- Avoid testing in conditions of high electrostatic or electromagnetic fields.
- Maintenance should only be performed by authorised personnel.
- There are no user replaceable parts in the Tester.
- The unit should be regularly calibrated (at least annually).
- For repair or calibration return the instrument to:-

Seaward Electronic Limited.
Bracken Hill
South West Industrial Estate
Peterlee
Co. Durham
SR8 2SW
Tel : +44 (0)191 586 3511
Fax: +44 (0)191 586 0227
sales@seaward.co.uk

Chapter 6 Accessories

A series of standard and optional accessories are available for the Seaward Europa Tester. The standard accessories are supplied with the Tester.

Standard Accessories

Accessory	Part Number
Earth Bond Test Lead	249A908
Mains Lead	270A025
115V Adaptor Lead	270A076
Carry Case	270A950
Manual	270A555

Optional Accessories

Accessory	Part Number
Calibration Checkbox	283A951
Barcode Scanner	283A922
Thermal Label Printer	283A954
Thermal Printer Labels	283A304
Appliance Number Labels (250)	194A307
Test Code Labels (240)	194A308
Serial Printer Lead	283A955
Serial to Parallel adaptor	270A954
IrDA Reciever Link	273A953
Serial-PC Download Lead (9-9 way)	194A919
Serial-PC Download Lead (9-25way)	194A920
Pass Labels (500)	91B038
PATS Software (DOS)	161A221
PATS Plus Software (DOS)	161A922
PATS Plus for Windows™	161A947
PATSwin	161A951

Chapter 7 Specifications

Earth Bond Test

Test Voltage *6V nominal (no load)
Test Current *4A, 10A, 25A selectable (into s/c load)
Range 40m Ω - 19.99 Ω
Resolution.....0.01 Ω
Accuracy..... +/- 5% of reading, +/- 2 digits
Pass
Levels.....selectable
Misc.....4-wire measurement, floating earth

DC Earth Bond Test

Test Voltage *4V nominal (no load)
Test Current *-200mA,+200mA selectable (into s/c load)
Range 40m Ω - 19.99 Ω
Resolution.....0.01 Ω
Accuracy..... +/- 5% of reading, +/- 2 digits
Pass
Levels.....selectable
Misc.....4-wire measurement, floating earth

Earth Screen Test

Test Voltage * 100mV nominal (no load)
Test Current *100mA (into s/c load)
Range..... 40m Ω - 19.99 Ω
Resolution.....0.01 Ω

Accuracy..... +/- 5% of reading, +/- 2 digits upto 5.00Ω
Pass Levels.....selectable
Misc.....4-wire measurement, floating earth

Insulation Test

Test Voltage * 500V d.c. or 250V d.c. nominal (0.5MΩ load)
Short Circuit Current..... 2mA d.c. maximum
Range..... 100kΩ - 100 MΩ
Resolution.....0.01 MΩ
Accuracy..... +/- 5% of reading, +/- 2 digits (100kΩ - 20MΩ)
Pass Levels..... 0.5MΩ, 1.0MΩ, 2.0MΩ, 4.0MΩ, 7.0MΩ

Substitute Leakage Test

Test Voltage * 40V a.c. o/c
Display Range 0.1 - 20.0 mA a.c.
Resolution.....0.01mA
Accuracy..... +/- 10% of reading, +/- 2 digits 1.00 - 20mA
Pass Levels.....0.25mA, 0.5mA, 0.75mA, 2.5mA, 3.5mA, 7.0mA, 9.9mA, 15.0mA

Leakage

Range..... 0.1mA - 10.0mA
Resolution.....0.01mA
Accuracy..... +/- 5% of reading, +/- 2 digits
Pass Levels.....0.25mA, 0.5mA, 0.75mA, 1.5mA, 2.25mA, 2.5mA, 3.0mA, 3.5mA, 9.9mA

Touch Leakage

Range.....0.1mA - 2.0mA
Resolution.....0.01mA
Accuracy..... +/- 10% of reading, +/- 2 digits
Pass Levels.....0.25mA, 0.5mA, 1.0mA

Power Tests

Socket.....Selectable 115V BS4343, BS546 / 230V BS 1363 socket.

Measured Voltage..... 90 - 300V
Indication only.

Measured Load 0 - 4kVA
Indication only.

IEC Lead Test

Test Voltage *250V d.c.

Test Current *1mA nominal

Detects..... Open, Short, Good, Reverse

* - Test stimulus based on mains supply of 230V, varies with supply voltage.

Mechanical

Size..... 450mm x 410mm x 155mm

Weight..... 3.5kg

Environmental

Operating..... 0°C to 40°C (non condensing)

Storage -10°C to 50°C (non condensing)

Maximum R.H 90%

Supply Rating..... 230V 50/60Hz

Max Output Current..... 16A

Fuses(Internal).....not user replacable

Appendix A Purpose of Tests

Earth Bond Test

This test is to ensure that the connection between the earth pin in the mains plug of the appliance and the metal casing of the appliance is satisfactory and of sufficiently low resistance.

A selectable test current is applied between the earth pin of the mains supply plug and the earth bond test lead clip.

A high current is normally used to stress the connection under fault conditions. The length of the test should be limited to prevent damage due to overheating.

Earth Screen Test

This test is to check the earth screen connection using a current which will prevent damage that may be caused by testing using high currents. This is often required by sensitive electronics such as computers and other Information Technology (IT) equipment.

A low voltage of approximately 100mV AC RMS is applied between the earth pin of the mains supply plug and the Earth Bond test lead clip. A current of 100mA is allowed to flow for the duration of the test.

Insulation Test



500 V / 250V d.c. test voltage

This test is used to verify that adequate insulation exists between the mains supply pins and earth.

During the insulation test, a 500V DC voltage is applied between the earth pin and both the live and neutral pins of the appliance mains

supply plug. The Tester displays the resistance measured and allows the user to confirm sufficient insulation exists.

For Class 2 appliances, the Earth Bond Test clip can be used for an earth return lead.

For appliances which incorporate over-voltage protection, a 250V DC test voltage is provided to allow a reading to be taken without the protection devices generating a false failure.

Substitute Leakage Test

The substitute leakage test applies a nominal voltage of 40V AC RMS to the appliance and is applied between the earth pin and both the live and neutral pins of the supply plug. For Class II appliances, connect the Earth Bond test clip to the appliance as a substitute for the Earth.

The Tester measures the current that flows and scales the result to display a guide to the current that would flow if the test voltage had been the nominal mains supply voltage, scaled for the applicable socket.

Please note that values for Substitute 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).

This test can prove useful in situations where neither conventional Insulation nor Flash tests are acceptable methods of testing the insulation of the appliance.

IEC Lead Test

This test confirms the electrical safety of 230V IEC leads.

The IEC test performs a continuity and polarity check on the Live and Neutral conductors and confirming that there are no breaks or cross wiring in these conductors.

Powered Tests



Mains voltage applied to appliance

The following powered tests differ from the previous tests in that they apply mains supply voltage to the appliance to perform their functions:-

- Leakage Test
- Touch Leakage Test
- Operation Test

The Tester performs an initial low voltage test to establish that the appliance can be safely powered.



It is important that the user verifies that an appliance with moving parts (e.g. an electric drill) is safely mounted to allow movement without causing damage to equipment or personnel.

If the potential load current is too high, a warning message appears, allowing the user to continue. If a Live to Neutral short exists, this message will appear, and if tests are continued the fuses will blow. If the potential load current is low, a warning message appears to allow the user to check that the appliance is switched on, and all fuses are intact. The Tester also performs a safety test to verify that internal relays are properly set before applying full mains supply to the appliance.

Power to the appliance will remain until the Red Button is pressed. This allows the user to switch between the three powered tests without removing power from the appliance.

Leakage Test



Warning

Mains voltage applied to appliance

The Leakage Test shows the current being lost through Leakage as the difference in the currents flowing in the Live and the Neutral conductors. This difference is the total leakage away from the appliance, and is generally equivalent to the current flow through the earth lead of the appliance, and displays the result in milliamps (mA).

This differential method of determining leakage will show the full leakage of an appliance in-situ, so if the appliance has an extra earth point, i.e. water pipe, then the Tester will show the full and true appliance leakage. This is also known as Enclosure or Differential Leakage.

Touch Leakage Test



Warning

Mains voltage applied to appliance

The Touch Test displays the current that would flow if the appliance was touched by a person. This is based on a 'body model' of 2k Ω .

The Tester detects any current flowing in the Earth Bond Lead (attached to an appropriate point on the appliance) and indicates the potential leakage through a metal panel. The Tester displays the result in milliamps (mA).

Operation Test



Mains voltage applied to appliance

The Power test supplies the equipment under test (appliance), connected to 115V/230V test sockets, with the rated voltage of that socket.

The Tester measures the power used by the appliance and displays the reading in kVA. There is no test duration limit on the Power tests. Once supplied with power, the appliance will be supplied until the operation is cancelled. This will allow appliances with slow start-up speeds the time to ramp up to their working state.

Appendix B Reference Information

Factory-set Test Sequences

Name	Earth Bond	Insulation	Leakage	Touch Leakage
Household CLS1	0.1Ω	0.5MΩ	0.75mA	0.5mA
Household CLS2	SKIP	1.0MΩ	0.25mA	SKIP
IT Equipment 1	0.1Ω	0.5MΩ	SKIP	SKIP
IT Equipment 2	SKIP	1.0MΩ	SKIP	SKIP
230V HH Power 1	0.1Ω	0.5MΩ	0.75mA	0.5mA
230V HH Power 2	SKIP	1.0MΩ	0.25mA	SKIP
230V Lead (3m)	0.08Ω	0.5MΩ	SKIP	SKIP
230V Lead (6m)	0.2Ω	0.5MΩ	SKIP	SKIP
230V Lead (12m)	0.3Ω	0.5MΩ	SKIP	SKIP
110V HH Power 1	0.1Ω	0.5MΩ	SKIP	SKIP
110V HH Power 2	SKIP	1.0MΩ	SKIP	SKIP
110V Lead (6m)	0.2Ω	0.5MΩ	SKIP	SKIP
110V Lead (12m)	0.3Ω	0.5MΩ	SKIP	SKIP
110V Luminair 1	0.5Ω	0.5MΩ	SKIP	SKIP
110V Luminair 2	SKIP	1.0MΩ	SKIP	SKIP

Testcode Tables

The test sequence code is split into two 10-digit testcodes, this Appendix describes how the two testcodes are broken down.

First Testcode:

Digit 1	Visual Inspection/Polarity	Voltage
H	No Visual Inspection No Polarity Test	230V
I	Visual Inspection No Polarity Test	230V
J	No Visual Inspection Polarity Test	230V
K	Visual Inspection Polarity Test	230V
L	No Visual Inspection No Polarity Test	115V
M	Visual Inspection No Polarity Test	115V
N	No Visual Inspection Polarity Test	115V
O	Visual Inspection Polarity Test	115V

Digit 2	Earth Bond
0	Skip Earth Bond
1-9	Earth Bond Fault Limit (m Ω)

Digit 3	<u>Earth Bond Multiplier</u>	<u>Current</u>
1	x1	4A
2	x10	4A
3	x100	4A
4	x1000	4A
5	x1	10A
6	x10	10A
7	x100	10A
8	x1000	10A
A	x1	25A
B	x10	25A
C	x100	25A
D	x1000	25A
E	x1	100mA a.c.
F	x10	100mA a.c.
G	x100	100mA a.c.
H	x1000	100mA a.c.
I	x1	+200mA
J	x10	+200mA
K	X100	+200mA
L	X1000	+200mA
M	X1	-200mA
N	X10	-200mA
O	X100	-200mA
P	X1000	-200mA
Q	X1	+/-200mA
R	X10	+/-200mA
S	X100	+/-200mA
T	x1000	+/-200mA

Testcode Tables

Digit 4	Insulation	Voltage
0	Skip	
1	0.5M Ω	250V d.c.
2	1.0M Ω	250V d.c.
3	2.0M Ω s	250V d.c.
4	4.0M Ω	250V d.c.
5	7.0M Ω	250V d.c.
6	0.5M Ω	500V d.c.
7	1.0M Ω	500V d.c.
8	2.0M Ω	500V d.c.
9	4.0M Ω	500V d.c.
A	7.0M Ω	500V d.c.
B	10.0 M Ω	250V d.c.
C	50.0 M Ω	250V d.c.
D	10.0 M Ω	500V d.c.
E	50.0M Ω	500V d.c.

Digit 5	Sub-Leakage
0	Skip
1	0.25mA
2	0.50mA
3	0.75mA
4	2.50mA
5	3.50mA
6	7.00mA
7	9.90mA
8	15.0mA

Digit 6	Not Used (Set to 0)¹
0	Reserved
1	Reserved
2	Reserved
3	Reserved
4	Reserved

Digit 7	Leakage
0	Skip
1	0.25mA
2	0.50mA
3	0.75mA
4	1.50mA
5	2.25mA
6	2.50mA
7	3.00mA
8	3.50mA
9	9.90mA

Digit 8	Touch Leakage
0	Skip
1	0.25mA
2	0.50mA
3	1.00mA

Digit 9	Earth Bond Test Duration
1	2s
2	5s
3	10s
4	30s

Testcode Tables

Digit 10	Insulation Test Duration
1	2s
2	5s
3	10s
4	30s

Second Testcode

Digit 1	Sub-Leakage Test Duration
Q	2s
R	5s
S	10s
T	30s

Digit 2	Flash Test Duration
1	2s
2	5s
3	10s
4	30s

Digit 3	Leakage/Load Test Duration
1	2s
2	5s
3	10s
4	30s
5	60s
6	120s
7	180s
8	Unlimited

Digit 4	Touch Leakage Test Duration
1	2s
2	5s
3	10s
4	30s
5	60s
6	120s
7	180s
8	Unlimited

Digit 5	Number of Earth Bond Tests
0	1
1	1
2	2
3	3
4	4
5	5
6	10
7	15
8	20
9	25
A	30
B	Unlimited

Testcode Tables

Digit 6	Number of Insulation Tests
0	1
1	1
2	2
3	3
4	4
5	5
6	10
7	15
8	20
9	25
A	30
B	Unlimited

Digit 7	Number of Substitute Leakage Tests
0	1
1	1
2	2
3	3
4	4
5	5
6	10
7	15
8	20
9	25
A	30
B	Unlimited

Digit 8	Not Used (Set to 0)¹
0	Reserved
1	Reserved
2	Reserved
3	Reserved
4	Reserved
5	Reserved
6	Reserved
7	Reserved
8	Reserved
9	Reserved
A	Reserved
B	Reserved

Digit 9	Number of Load/Leakage Tests
0	1
1	1
2	2
3	3
4	4
5	5
6	10
7	15
8	20
9	25
A	30
B	Unlimited

Testcode Tables

Digit 10	Number of Touch Leakage Tests
0	1
1	1
2	2
3	3
4	4
5	5
6	10
7	15
8	20
9	25
A	30
U	Unlimited

¹These digits are included for compatibility with other Seaward test instruments. They should be set to the indicated values unless they are being used with other testers.

