



Operating Instructions

# SAFETCHECK

Pro Logger II



The **SAFETCHECK Pro Logger II** is an electrical Portable Appliance Tester (PAT), designed and manufactured in Australia. The **Pro Logger II** ensures the electrical safety of appliances is compliant with the requirements of the current Australian and New Zealand Standard AS/NZS 3760 (In-service safety inspection and testing of electrical equipment).

The **Pro Logger II** is unique in that **checkCONNECT** ensures an appliance is correctly connected prior to running a test sequence. Most, if not all other testers, will pass an appliance even if it is not connected in accordance with the standard.

With the **Pro Logger II**, testing Electrical Safety of Appliances has never been as simple, fast, accurate, thorough and safe. You can test the safety of Class 1 (earthed) appliances, Class 2 (double insulated) appliances, Fixed and Portable RCD's and extension leads in accordance with the standard, simply and efficiently. There is no interpretation, no ambiguity, just a simple PASS or FAIL.



# Contents

## Contents

- 4** Testing of appliances with the *Pro Logger II*
- 5** Frequency of electrical safety testing
- 6** Function and basic technical specification
- 8** Preparation of the appliance prior to safety testing
- 9** Operating the *Pro Logger II*
- 10** Safety testing earthed appliances
- 12** Safety testing double insulated appliances
- 14** Safety testing extension leads
- 15** Safety testing other appliances  
(OTHER APPLIANCE menu)
- 16** Run testing (Leakage current test)
- 16** Run testing earthed appliances
- 17** Run testing double insulated appliances
- 18** RCD Tester (Option)
- 20** High current earth test (Option)
- 21** Utilities Menu (F2 key)
- 22** Data Logger operating instructions

For more information regarding the electrical testing of Portable Electrical Appliances, see also the TRIO Smartcal website (Frequently Asked Questions - FAQs)

[http://www.triosmartcal.com.au/stc\\_pat\\_faq.php](http://www.triosmartcal.com.au/stc_pat_faq.php)



## The testing of appliances with the STC Pro Logger II

The *Pro Logger II* will test most 240V 50Hz single phase class 1 and 2 electrical appliances and extension leads to comply with the current electrical safety standard AS/NZS 3760. Any appliances with characteristics which may require modified test parameters (in accordance with the standard) may be found in the OTHER APPLIANCE menu. If you experience difficulties or doubts in testing certain appliances please contact TRIO Smartcal.

The *Pro Logger II* has been designed to comply with Australian Standards AS3100, AS3760 & AS4024.1 to maximise user safety.

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# Frequency of electrical safety testing

## (Guide only)

The minimum recommended frequency of safety testing of electrical equipment is specified in Australian Standard for in service testing AS/NZS 3760.

Type of environment in which equipment is used	Earthed appliance	Double insulated appliance	Extension cords
Factories, shops & places of work manufacturing, repair, maintenance or construction	6 months	12 months	6 months
Office environment where equipment is not subject to constant flexing of the supply cord	5 years	5 years	12 months
Other commercial environments, e.g. tea rooms, office, kitchens, health care studios, with no protection	12 months	12 months	6 months
Construction and Demolition sites	3 months	3 months	3 months
Hire equipment	Before each hire	Before each hire	Before each hire

**Note:** Some organisations may alter these periods based on a documented risk assessment, undertaken in accordance with the process specified in AS/NZS 4360 (see AS/NZS 3760 "Frequency of Inspection and Tests")



# Function and basic technical specification

The **Pro Logger II** has been designed to comply with Australian Standards AS3100, AS3760 & AS4024.1 to maximise user safety.

## Mains Power Outlet Check (**Pro Logger II**)

The mains power outlet supplying the STC is checked for the existence of an Earth and Active-Neutral transposition.

### Earthed appliances are tested for:

- Electrical continuity  $\leq 100\text{K Ohm}$
- Earth continuity  $\leq 1\text{ Ohm @ } 200\text{mA}$
- Insulation resistance  $\geq 1\text{M Ohm}$  (250/500V DC Selectable)

**Note:** *If the appliance requires mains power to energise its On/Off switch (and the switch must be "on" to complete the mains electrical circuit), the Pro Logger II can conduct a Current Leakage Test (Run Test) to ensure Leakage Current is  $\leq 5\text{mA}$ .*

### Double insulated appliances are tested for:

- **checkCONNECT** (unique to the **Pro Logger II**) Ensures the stainless steel cloak is correctly in place:
  - to provide a return path for any leakage current during the insulation resistance test; and
  - provides user protection from electric shock
- Electrical continuity  $\leq 100\text{K Ohm}$
- Insulation resistance  $\geq 1\text{M Ohm}$  (250/500V DC Selectable)

**Note:** *If the appliance requires mains power to energise its On/Off switch (and the switch must be "on" to complete the mains electrical circuit), the Pro Logger II can conduct a Current Leakage Test (Run Test) to ensure Leakage Current is  $\leq 1\text{mA}$ .*

### Extension cords are tested for:

- Insulation resistance  $\geq 1\text{M Ohm}$
- Earth circuit continuity  $\leq 1.0\text{ Ohm @ } 200\text{mA}$
- Electrical continuity for resistance Active / Neutral  $10\text{K Ohm nominal}$
- Connection polarity (transposition of active and neutral)

## Test duration

- 3.5 seconds

## Electrical stress test parameters

- Insulation 500V DC / 250V DC
- Earth circuit 200mA nominal (High Current Earth Test Option available)

## Run test (leakage current test)

- Separate 15A Run Socket for user safety (no switched earth - compliant with AS3100)
- Leakage current clamped at 6mA for user safety. Run Test will terminate at  $> 6\text{mA}$  leakage current.
- Supplies 15A @ 240V AC for the duration of test
- The duration of Run Tests is user variable

## RCD Tester (when fitted)

- Insulation resistance  $\geq 1\text{M Ohm}$
- Earth circuit continuity  $\leq 1.0\text{ Ohm @ } 200\text{mA}$
- Electrical continuity for resistance Active / Neutral  $10\text{K Ohm nominal}$
- Connection polarity (transposition of active and neutral)
- Mains Isolation Transformer included
- Trip Time  $< 300\text{mS @ } 30\text{mA}$  &  $< 40\text{mS at } 10\text{mA}$  (measured at  $0^\circ$  and  $180^\circ$  crossing)

## Display

LCD to indicate:

- Pass/Fail
- Measured Values (if enabled)
- Possible fault conditions
- User information

LEDs to indicate:

- Fail / Reset (Red)
- Start / Ready (Green)



## Data Logging

- Complete user control of Data Logging functions:
  - Logging can be switched on/off
  - Individual Fields can be switched on/off
- Uses Keyboard and Scanner
- Actual Time & Date stored with each test record
- Stores 500, 1000 or 2000 records
- Records are easily uploaded to a PC
- Records are always appended to memory to prevent accidental loss of data

## Power requirements

240V AC +/- 10% @ 50Hz

The mains power outlet supplying the *Pro Logger II* is checked for:

- The existence of an Earth;
- Active-Neutral transposition; and
- Mains Voltage tolerance.

## Test inlets

- Flush mounted mains plugs for test purposes (both IEC and standard 240V), protected from accidental application of 240V 50Hz mains voltage
- Flush mounted 240V socket

## Operating instructions

- On screen prompts displayed and clearly labelled switches
- Step by step instructions detailed in this Manual

## Warranty period

12 months from date of purchase

## Extended warranty

By registering online at [www.triosmartcal.com.au](http://www.triosmartcal.com.au) an extended warranty of 6 months will be offered

## Calibration period

Recommended every 12 months

## Repairs and calibration

SAFETCHECK PATs can only be calibrated by TRIO Smartcal Service Centres.

We recommend that the *Pro Logger II* is returned to a TRIO Smartcal Service Centre for repair and/or calibration. In doing so you are assured that any recent basic enhancements to the software (applicable to your *Pro Logger II*) will be included in the repair or calibration as a matter of policy. Contact TRIO Smartcal Pty Ltd for details.

## Included Accessories

- DownLoader CD including Manuals
- Combined return test lead and clip for both Class I & II appliances
- Stainless steel cloak (350 x 600mm)
- Calibration Certificate
- Computer Interface Cable

## Optional Accessories

- RCD Tester (10mA & 30mA Portable & Fixed RCDs c/w integrated Isolation Transformer)
- High Current Earth Tester (200mA continuity, 10A routine and 25A type tests)
- Scanner
- Keyboard
- Upgrade from 500 to 1000 or 2000 stored records
- Large stainless steel cloak (350 x 900mm)
- Test tags (with barcodes optional)
- Barcoded item stickers, tested labels and danger tags
- Removable lid

**Note 1:** Tolerance on all stated values is  $\pm 5\%$

**Note 2:** TRIO Smartcal Pty Ltd reserves the right to change specifications at any time without notice.



## Preparation of the appliance prior to safety testing


### General visual inspection

- 1 Ensure the appliance to be safety tested has no obvious mechanical faults and is free from external damage.
- 2 Inspect the supply lead for any damage, defects or loose terminals in the accessories, connectors, plugs or outlet sockets. Common faults encountered:
  - a) Frayed or damaged supply lead.
  - b) Exposed conductors and/or covered by insulation tape.
  - c) Abrasions in the outside insulation jacket.
  - d) Supply lead anchorage at plug or appliance entry.
- 3 Check that any controls, alarms and replaceable protective devices accessible to the user, are of correct rating and in good working order.
- 4 Inspect all switches and speed controls for mechanical operation; ensure switches and controls are clear of any obstruction, e.g. filings, swarf, metal particles, grease, etc.
- 5 Confirm all identity tags/labels etc. pertaining to the frequency of safety testing are correctly attached and records of all test/inspections are kept to ensure the safety integrity and history of the appliance.
- 6 Unroll extension leads/rolls and inspect as above.

### Identify the appliance to be tested

Examine the appliance to be tested and identify whether the appliance is an earthed appliance, a double insulated appliance or an extension cord.

Earthed appliances should always have an earth pin on their plug, and will normally have exposed metal components.

Double insulated appliances may be identified by the double insulation  symbol, and/or by the absence of an earth pin on a moulded socket (not deliberately removed or broken off).

**Note 1:** Many double insulated tools are colour coded blue.

**Note 2:** If any doubt exists about the Class of an appliance (Class I or II), the appliance should be tested as an earthed appliance first (see also OTHER APPLIANCE menu).

### Preparation of an earthed appliance to be safety tested

- 1 Switch any/all switches 'ON'.
- 2 Set any speed control or thermostat to 'FULL ON' (Maximum speed).
- 3 Preparation for earthed appliance to be safety tested is now complete and may be connected to the *Pro Logger II*.  
(see *Safety Testing Earthed Appliances*)

### Preparation of a double insulated appliance to be safety tested

- 1 Switch any/all switches 'ON'.
- 2 Set any speed control or thermostat to 'FULL ON' (Maximum speed).
- 3 Preparation for a double insulated appliance to be safety tested requires the appliance to be wrapped in a stainless steel cloak taking care to make contact with all metal components and the exterior of the appliance where hand contact is normally possible.
- 4 The double insulated appliance is now ready to be safety tested and may be connected to the *Pro Logger II*. (see *Safety Testing Double Insulated Appliances*)

**Note:** The above description regarding the inspection and testing of electrical appliances is a guide only. Please refer also to the current standard AS/NZS 3760.

### WARNING

Upon completion of a safety test and subsequent removal of test lead and/or stainless steel cloak, please ensure all switches, speed or thermostat controls are returned to their 'OFF' or minimum position.



# Operating the STC Pro Logger II



Place the **Pro Logger II** on a convenient non-conductive working surface. Insert the mains plug into a correctly wired and earthed mains power outlet. The following sequence will occur:

- 1 Start Prompt appears on the Liquid Crystal Display (LCD); (If the Data Logging function is turned on then the Time and Date and Memory used is displayed. Pressing reset after each of these screens will display the Start Prompt);
- 2 There is a short beep; and
- 3 The TEST and FAIL LEDs flash momentarily.

The **Pro Logger II** is now ready to perform Appliance Safety Testing.

Any departure from these conditions may mean the **Pro Logger II** has a fault and should be returned to a TRIO Smartcal Service Centre for service.

**Note 1:** If a message appears on the LCD indicating an Active-Neutral reversal or an Earth fault then there is a problem with the power outlet supplying the **Pro Logger II**. At this point the tester will cease to function, preventing any appliance testing being performed under fault conditions. Either the power outlet fault must be corrected prior to proceeding or an alternate power outlet must be used to power the **Pro Logger II**.

**\*Note 2:** When using the Scanner together with the Keyboard, connect the Keyboard to the Scanner's "Keyboard Wedge Cable" via the PS/2 connection. Connecting the keyboard and scanner via separate USB ports will occasionally cause the keyboard to send spurious characters to the **Pro Logger II** while scanning barcodes.

## Safety testing earthed appliances

- 1 Ensure the *Pro Logger II* is in the self test mode i.e. Start Prompt appears on the LCD.
- 2 Plug the appliance to be tested into the socket labelled INSULATION RESISTANCE provided on the front panel of the *Pro Logger II*. The appliance should be connected directly and not via an extension lead.
- 3 Connect the Return Lead to the unit via the IEC Plug.
- 4 Connect the Return Lead to a convenient metal (conductive) point of the appliance under test.

If any earthed appliance has one or more metal components which are possibly not connected together, the overall test must be repeated with the Return Lead connected to each metal component in turn.

- 5 Switch the appliance to be tested 'ON'

**Note:** Any or all switches must be "on" to ensure testing of the appliance's complete electrical circuit.

- 6 If the appliance to be tested has a variable speed or thermostat control fitted, turn the control to its highest setting, this will connect Active/Neutral direct to the internal windings.
- 7 Select EARTHED APPLIANCE.  
The *Pro Logger II* is now ready to test the appliance.

**Note:** If Data Logging is switched on then additional information will be requested. See section entitled "Data Logging"

The green indicator alongside "Start" will now be flashing.

**Note:** During the test cycle the user may apply stress to the supply lead and plug in order to detect any intermittent faults

- 8 Test results will be displayed on the LCD along with audible tones and flashing LEDs.
  - a) Pass - 👍 'Thumbs Up' and PASS indication on LCD and a short BEEP with a GREEN indicator flashing along side "Start".
  - b) Fail - 👎 'Thumbs Down' and/or LCD Prompt indicating the most probable reason for failure with:  
The measured value (if enabled), a continuous BEEP and a RED indicator flashing alongside "Reset".

### WARNING

To avoid uncertain results when testing an earthed appliance, ensure that:

- 1 The earth clip is securely attached to the metal frame.
- 2 It has been disconnected from all other equipment.
- 3 The test is conducted on an insulated or (non metallic) benchtop.

**Note 1:** A FAIL indicating "poor continuity" denotes lack of a circuit path between the Active and Neutral of the appliance. If the appliance switch is on and this error occurs then go to the RUN TEST.

**Note 2:** For a FAILED earthed appliance known to be fitted with surge protection i.e. metal oxide varistors (MOVs), test again using Class 2 (250V) test, see OTHER APPLIANCES.

**Note 3:** For appliances with no class identification, no accessible earth and having 3 pins on the plug, a standard double insulated test may fail, see OTHER APPLIANCE menu.

### Evaluation of in-service testing results for earthed appliances

Where the *Pro Logger II* identifies an appliance which fails to comply with the test criteria, the equipment shall be:

- 1 Withdrawn from service immediately and have a label attached to it warning against further use.
- 2 Repaired by the appropriately qualified person and retested after repair.
- 3 Refit test identity tags/labels etc. and log test in safety history records.

### WARNING

Upon completion of a safety test and subsequent removal of test lead and/or stainless steel cloak, please ensure all switches, speed or thermostat controls are returned to their 'OFF' or minimum position.



# Safety testing earthed appliances (continued)



## Safety testing double insulated appliances

- 1 Plug the double insulated appliance to be tested into the socket labelled INSULATION RESISTANCE provided on the front panel of the **Pro Logger II**.

**Note:** The appliance must be plugged in directly, and not via extension leads.

- 2 Switch the appliance to be tested 'ON'

**Note:** Any or all switches must be "on" to ensure testing of the appliance's complete electrical circuit.

- 3 If the appliance to be tested has a variable speed control fitted, turn the control fully 'ON' or to the highest speed, this will connect Active/Neutral direct to the internal windings.

- 4 Wrap the appliance in the stainless steel cloak, taking care to make contact with all metal components and the exterior of the appliance where human hand contact is normally possible.

The stainless steel cloak may also be woven metal cloth mesh, conductive braid, aluminium foil, or other suitable flexible conductor with low resistance (less than 100 Ohms).

**Note:** The wrapped appliance should be on an insulated bench to avoid earthing the measurement circuit in the **Pro Logger II**.

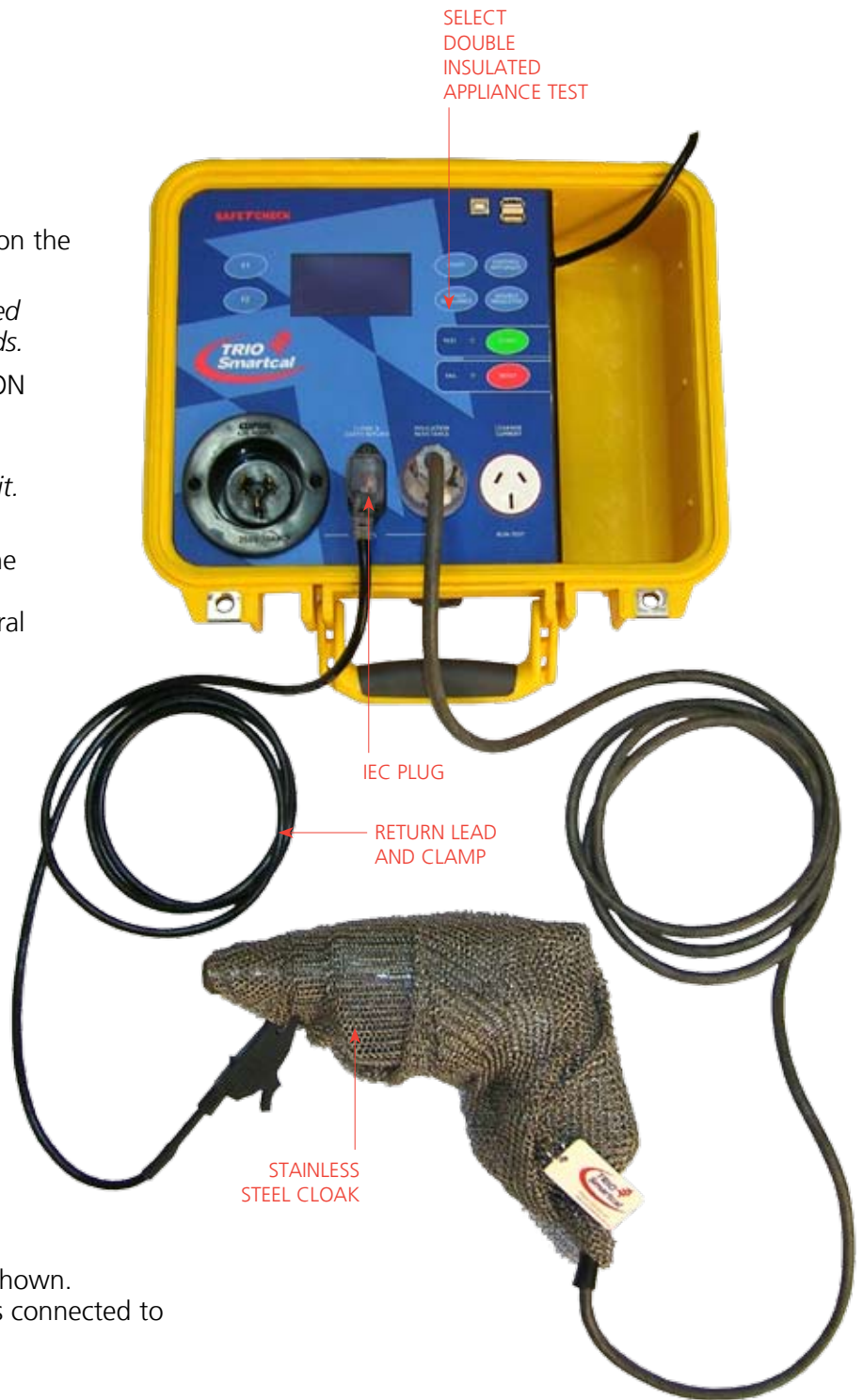
- 5 Connect the Clamp of the Return Lead to the stainless steel cloak as shown. **checkCONNECT** ensures the Clamp is connected to the stainless steel cloak.

- 6 Select DOUBLE INSULATED. The **Pro Logger II** is now ready to test the appliance.

**Note:** If Data Logging is switched on then additional information will be requested. See section entitled "Data Logging"

The green indicator alongside "Start" will now be flashing.

**Note:** During the test cycle the user may apply stress to the supply lead and plug in order to detect any intermittent faults



## Safety testing double insulated appliances (continued)

7 During the test cycle the *Pro Logger II's* **checkCONNECT** will check that the stainless steel cloak and return lead are correctly connected. This will ensure that the correct test environment is present to measure the insulation resistance of a double insulated appliance. **checkCONNECT** is a unique feature of the SafeTcheck Portable Appliance Testers.

8 If the verification test passes the *Pro Logger II* will continue with the double insulated appliance test.

If the verification test fails then it may be for one or more of the following reasons:

- a) **checkCONNECT** has found the double insulated appliance is not correctly wrapped or connected to the return lead for double insulated appliances.
- b) The assumed double insulated appliance is in fact an earthed appliance.
- c) The double insulated appliance is connected to the *Pro Logger II* via a non-compliant extension cord.
- d) The appliance is earthed via another path such as a metal earthed bench.
- e) Both active (A) and neutral (N) leads are open circuited in the appliance e.g. failure to turn 'ON' appliance switch(es).
- f) The resistance of the stainless steel cloak around the appliance is too high.
- g) The appliance has low capacitive coupling between the external surface (the stainless steel cloak) and the internal electrical circuit. Place some of the mains cable under the Cloak to overcome this problem. This may apply to some appliances with minimum internal circuitry e.g. a plastic bedlamp, a vacuum cleaner where the motor is separated by a relatively large distance from the case, or a mobile phone charger.

9 Test results will be displayed on the LCD along with audible tones and flashing LEDs.

- a) Pass - 👍 'Thumbs Up' and PASS indication on LCD and a short BEEP with a GREEN indicator flashing along side "Start".
- b) Fail - 👎 'Thumbs Down' and/or LCD Prompt indicating the most probable reason for failure with:  
The measured value (if enabled), a continuous BEEP and a RED indicator flashing along side "Reset".

**Note 1:** A FAIL indicating "poor continuity" denotes lack of a circuit path between the Active and Neutral of the appliance. If the appliance switch is on and this error occurs then go to the RUN TEST.

**Note 2:** For a FAILED double insulated appliance known to be fitted with surge protection i.e. metal oxide varistors (MOVs), test again using Class 2 (250V) test, see OTHER APPLIANCE menu.

**Note 3:** For appliances with no class identification, no accessible earth and having 3 pins on the plug, a standard double insulated test may fail, see OTHER APPLIANCE menu.

### Evaluation of in-service testing results

Where the *Pro Logger II* identifies an appliance/tool which fails to comply with the test criteria the equipment shall be:

- 1 Withdrawn from service immediately and have a label attached to it warning against further use.
- 2 Repaired by the appropriately qualified person and retested after repair.
- 3 Refit test identity tags/labels etc. and log test in Safety history records.

### WARNING

Upon completion of a safety test and subsequent removal of test lead and/or stainless steel cloak, please ensure all switches, speed or thermostat controls are returned to their 'OFF' or minimum position.



## Safety testing extension leads



SELECT  
LEADS  
TEST

LEAD UNDER TEST



EPOD UNDER TEST

- 1 Plug the extension lead into the plug and socket labelled LEADS provided on the front panel of the **Pro Logger II**.
- 2 Select LEADS.  
The **Pro Logger II** is now ready to test the appliance. The green indicator alongside "Start" will now be flashing.

**Note 1:** The appliance should be on an insulated bench to avoid earthing the measurement circuit in the **Pro Logger II**.

**Note 2:** If Data Logging is switched on then additional information will be requested. See section entitled "Data Logging"

**Note 3:** During the test cycle the user may apply stress to the supply lead and plug in order to detect any intermittent faults

- 3 Test results will be displayed on the LCD along with audible tones and flashing LEDs.
  - a) Pass - 👍 'Thumbs Up' and PASS indication on LCD and a short BEEP with a GREEN indicator flashing along side "Start".
  - b) Fail - 👎 'Thumbs Down' and/or LCD Prompt indicating the most probable reason for failure with:  
The measured value (if enabled), a continuous BEEP and a RED indicator flashing along side "Reset".

**Note 1:** If the extension lead has a fixed socket (as in extension reels), this must be connected to the fixed test plug on the **Pro Logger II** with a short TEST extension lead of rated voltage and current, which has been previously tested and verified SAFE. Normally, extension leads must be tested individually and not cascaded.

**Note 2:** If EPODs are fitted with surge protection i.e. metal oxide varistors (MOVs), test again using Class 2 (250V) test, see OTHER APPLIANCES.

**Note 3:** Each socket of the EPOD must be tested in turn.

**Note 4:** Long extension lead may fail if it is left coiled. Be sure to uncoil leads prior to testing. This must be done to visually inspect the lead in any case.

## Safety testing other appliances (OTHER APPLIANCE menu)

The *Pro Logger II* is capable of testing many electrical appliances with unusual characteristics. The OTHER APPLIANCE menu is used to select the test suitable for any of these appliances. The user may scroll through the list by using the F1 and F2 keys.

- 1 Appliances such as those fitted with surge protection or MOVs (Metal Oxide Varistors) may be tested at 250V (instead of 500V) by selecting one of the following:
  - **Class 1 250V**
  - **Class 2 250V**
  - **EPOD 250V**
  
- 2 Appliances requiring the mains voltage to be applied to activate the On/Off switch, shall have their leakage current checked by selecting one of the following:
  - **Class 1 Run Test**
  - **Class 2 Run Test**

(see also *Run testing*)
  
- 3 An earth continuity test may be conducted by selecting:
  - **Earth only test**
  
- 4 Appliances employing Mineral Insulated Metal Sheath (MIMS) such as stoves and electric jugs may be tested using a run test by selecting:
  - **MIMS Run Test**
  
- 5 RCDs rated at 10mA, 30mA either portable or fixed may be tested by selecting one of the following\*:
  - **10mA Portable RCD**
  - **30mA Portable RCD**
  - **10mA Fixed RCD**
  - **30mA Fixed RCD**



- 6 Appliances employing a PIEZO starter such as the starter on a gas oven may be tested by performing a run test. To do this select:
  - **PIEZO Run Test**
  
- 7 For appliances with no class identification, no accessible earth and having 3 pins on the plug, a standard double insulated Test may fail, In these cases, the following test may be used:
  - **3 pin Class II Run†**
  
- 8 Where a Class I earthed appliance requires a longer than normal run time (approximately 2 minutes), the following test may be used:
  - **Long Class I Run†**

**Note 1:** New tests may be added to the OTHER APPLIANCE menu from time-to-time. For details regarding upgrades contact TRIO.

**\*Note 2:** The RCD Tester is an option for the Pro Logger II (see also RCD Tester)

**†Note 3:** Available only in Pro Logger II's with firmware version 4.04 or later.



## Run testing (Leakage current test)

TRIO Smartcal recommends that the following Run tests are used only if the Insulation testing of an appliance fails.

Run tests apply the mains voltage (240V) to the appliance under test, exposing the user to the risk of personal injury (eg Electric Shock).

### Overview

The run test for earthed appliances (Class 1) and double insulated appliances (Class 2) are leakage current test modes to be used only for appliances that must be energised to operate a switching circuit.

## Run testing earthed appliances

- 1 Ensure the appliance is switched off.
- 2 Plug the appliance into the separate RUN TEST socket.
- 3 Connect the return lead to the *Pro Logger II* via the IEC plug.
- 4 Connect the Clamp of the Return Lead to a convenient earthed metal point on the appliance under test.

### WARNING

The appliance will operate for up to 20 seconds in the run test mode. Ensure rotating parts are NOT wrapped in the cloak. Appliances such as drills, angle grinders etc should be firmly restrained during the run test.

- 5 Switch the appliance on.
- 6 Select CLASS 1 RUN TEST under OTHER APPLIANCE menu (F1 and F2 keys move the selection of mode up or down respectively)
- 7 Press START button and follow the screen instructions. The appliance will operate for up to 20 seconds during the run test.
- 8 For Class I appliances requiring a longer than normal run test duration, see OTHER APPLIANCE menu.



**Note 1:** Pressing RESET at any point during the Run Test will shorten the test duration. This does not invalidate the test result.

**Note 2:** If Data Logging is switched on then additional information will be requested. See section entitled "Data Logging"

### WARNING

Upon completion of a safety test and subsequent removal of test lead, please ensure all switches, speed or thermostat controls are returned to their 'OFF' or minimum position.



## Run testing double insulated appliances

- 1 Ensure the appliance is switched off.
- 2 Wrap the appliance in the stainless steel cloak (please see Note 2 below)
- 3 Plug the appliance into the separate RUN TEST socket.
- 4 Connect the return lead to the *Pro Logger II* via the IEC socket and connect the return lead clip to the stainless steel cloak as per diagram.

### WARNING

The appliance will operate for up to 20 seconds in the run test mode. Ensure rotating parts are NOT wrapped in the cloak. Appliances such as drills, angle grinders etc should be firmly restrained during the run test.

- 5 Switch the appliance on. (The appliance may need to be switched on prior to being wrapped in the cloak)
- 6 Select CLASS 2 RUN TEST under OTHER APPLIANCE menu using the F1 and F2 keys.
- 7 Press START button and follow the screen instructions. The appliance will operate for up to 20 seconds during the run test.

**Note 1:** Pressing RESET at any point during the test will shorten the test duration. This does not invalidate the test result.

**Note 2:** The tester does not use **checkCONNECT** to test for the presence of a return lead and/or cloak in the Run Test mode. Failing to use the return lead and/or cloak invalidates the test.

**Note 3:** If Data Logging is switched on then additional information will be requested. See section entitled "Data Logging"



### WARNING

Upon completion of a safety test and subsequent removal of test lead, please ensure all switches, speed or thermostat controls are returned to their 'OFF' or minimum position.



## RCD Tester (Option)



FIG 1



FIG 2

### Overview

When fitted to the *Pro Logger II* the RCD tester ensures 10mA, 30mA, portable or fixed RCDs comply with the Australian standard for Electrical Appliance Safety (AS/NZS 3760).

When testing portable RCDs the *Pro Logger II* inserts an isolation transformer into the circuit to ensure any fixed RCD (in the mains supply circuit) is not tripped.

The *Pro Logger II* now incorporates a single In-Line RCD test that ensures that the appliance is tested to comply with the standard as both an extension lead and RCD.

This test can be used regardless of the latching characteristics of the RCD being either electronic or mechanical (as indicated by Fig 1 & 2).

When testing fixed RCDs the *Pro Logger II* uses a battery to power the LCD display after the RCD under test has been tripped. This ensures the displayed test result is visible to the user for approximately 2 minutes after the mains power is tripped during testing.

### Operation

Select the appropriate RCD test option from the OTHER APPLIANCE menu; use the F1 and F2 keys to scroll up and down the list of options.

### Portable RCDs (10 or 30mA)

Start the selected portable RCD test by pressing the "Start" button. A message on the LCD display will then instruct you to:

- 1 Connect the portable RCD between the "Standard 240V Test Plug" and "Insulation Test Socket" on the front panel of the STC; and
- 2 Press "Start" to initiate the test. The *Pro Logger II* will then display "Phase I" and perform an "Electrical Test" (Insulation & Earth).
- 3 The *Pro Logger II* will then display "Time RCD Arm RCD then hit Start". At this point, arm the RCD and press "Start" to perform the RCD trip time test.
- 4 After the RCD trips, the trip time will be displayed in milliseconds together with a "Pass" or "Fail" message.

To ensure the RCD has been tested on both raising and falling edges of the mains cycle, the *Pro Logger II* will then prompt you to perform a 180° test by resetting the RCD and pressing "Start" (this test is optional). After the RCD trips, the trip time will be displayed in milliseconds together with a "Pass" or "Fail" message.

**Note:** Pressing "Reset" after each RCD time test will move you quickly to the next screen.

## RCD Tester (Option) (continued)

### Fixed RCDs (10 or 30mA)

A Fixed RCD refers to an RCD in the mains power circuit supplying the *Pro Logger II*.

Start the selected Fixed RCD test by pressing the "Start" button. A warning will be displayed stating "Power will fail during this test".

Press the "Start" button again to initiate the test. After the RCD trips, the trip time will be displayed in milliseconds together with a "Pass" or "Fail" message. The *Pro Logger II* will provide power to the display while the RCD is reset and mains power is returned.

The *Pro Logger II* will then prompt you to perform a 180° test by resetting the RCD and then pressing "Start" (this is an optional test, ensuring the RCD has been tested on both raising and falling edges of the mains cycle). After the RCD trips, the trip time will be displayed in milliseconds together with a "Pass" or "Fail" message. The screen will be active for 2 minutes to enable you to record the time.

**Note 1:** In some cases a previously tested and safe extension lead may be required to connect the Panel Plug and the female socket of the RCD under test.

**Note 2:** If Data Logging is switched on then additional information will be requested. See section entitled "Data Logging"

### WARNING

- 1 When the *Pro Logger II* is in the RCD test mode, 240VAC is present on the front panel Test Socket
- 2 Do not connect an appliance to a Portable RCD under test
- 3 When testing a Portable RCD do not use the front panel "IEC 240V Test Plug". Only use the "Standard 240V Test Plug"
- 4 Care should be taken when tripping any Fixed RCD (causing a sudden loss of mains power) that other equipment, reliant on power from that circuit, will not be damaged.



## High current earth test (Option)

### Overview

When fitted, the High Current Earth Test Option enables the user of the *Pro Logger II* to apply any one of 3 test currents when testing earth circuits. The option consists of a fully integrated programmable constant current switch mode power supply capable of delivering up to 25A into the earth circuit of an electrical appliance under test.

To access the menus relating to the High Current Earth Tests select F2 when the Start Prompt is displayed on the Display. After pressing F2, scroll down the list of options (using the F1 and F2 keys) until the desired current range is displayed. The selected current setting may then be set to one of 2 modes:

- 1 Press Start for a “temporary setting” test where the selected test current is set until the *Pro Logger II* is switched off. After the power is switched on again the test current will have reverted to 200mA; or
- 2 Press F2 for the selected test current to be set as the default test current for all future Earth Tests.
- 3 If an earth test is conducted then the selected current will displayed on the display prior to the test commencing.

### Description of test settings

#### 1 Continuity Test (200mA)

This is the default general purpose setting, suitable for all appliances including Electronic and IT. The earth resistance threshold is set to 1Ω.

#### 2 Routine Test (10A)

Same test as applied to all electrical appliances during the manufacturing process. For manufacturers, the Routine Test is mandatory (conducted in accordance with AS/NZS 3100 ). The earth resistance threshold is set to 1Ω.

#### 3 Type Test (25A)

Same test as applied to selected sample electrical appliances during the manufacturing process. For manufacturers the Type Test is mandatory (conducted in accordance with AS/NZS 3100). The earth resistance threshold is set to 0.2Ω.

**Note 1:** The Type Test resistance threshold for AS/NZS 3100 is 0.1Ω. The threshold in the *Pro Logger II* is 0.2Ω. A threshold of 1Ω at 25A is not possible due to the 12V maximum voltage set for this test; as stated in AS/NZS 3760. Due to this low resistance threshold, the Type Test (25A) **may not be suitable for extension leads.**

**Note 2:** For STCs with serial nos. 10010, 10216, 10217, 10218, 10219 & 10225 only the 200mA continuity test is conducted when performing a Leakage Current Test (Run Test) on an appliance. If that appliance also requires a high current earth test then the “Earth test only” should be used in conjunction with the run test.



# Utilities Menu (F2 key)

## Overview

All Data Logging Utilities, display adjustment, measured values, earth current options (when fitted) and the setting of time & date are available from this menu.

The Utilities Menu is accessed via the F2 key when the *Pro Logger II* is at the Start Prompt.

Once in the menu, the user may scroll through the list by using the F1 and F2 keys.

To select an option, use the scroll keys. Once highlighted, press "Start" to enable the option or "Reset" to disable. A  will appear at the right of an enabled option.

## Menu Options:

- **Upload test results**  
(See Data Logging).
- **Delete test results**  
(See Data Logging).
- **Enable database**  
(See Data Logging).
- **Ask for Venue**  
(See Data Logging).
- **Ask for Technician**  
(See Data Logging).
- **Ask for App#**  
(See Data Logging).
- **Ask for Visual P/F**  
(See Data Logging).
- **Ask for Tag#**  
(See Data Logging).
- **Ask for Comment**  
(See Data Logging).
- **Earth continuity 0.2A**  
(When High Current Earth Test option is fitted)  
The Earth Continuity Current maybe set to either 0.2A as a default or as a 'one off'.
- **Routine test 10A**  
(When High Current Earth Test option is fitted)  
The Earth Continuity Current maybe set to either 10A as a default or as a 'one off'.
- **Type test 25A**  
(When High Current Earth Test option is fitted)  
The Earth Continuity Current maybe set to either 25A as a default or as a 'one off'.
- **Measured values**  
If enabled, Measured values will be displayed for failed tests.
- **Adjust display**  
Adjust the contrast of the LCD display.
- **Set Time/Date**  
(See Data Logging).



## Data Logger operating instructions



TESTING WITH THE  
STC Pro Logger II



SET UP FOR UPLOADING  
TEST RECORDS

### Overview

When Data Logging is enabled, data relating to each electrical test conducted is stored in the **Pro Logger II's** memory as measured values and a pass or fail. The standard **Pro Logger II** is able to store up to 512 records (DL500) with an option to expand this to 1023 records (DL1000) or 2048 records (DL2000). The STC has an on-board real time clock to stamp the time and date on each recorded test.

If the Data Logging option is set to "On", whenever the **Pro Logger II** is turned on, the Time & Date then the number of records used will be displayed prior to the Start Prompt. This information may be displayed at any time by pressing the F1 key while the LCD displays the Start Prompt.

Additional data such as the Venue (Company Name, Site & Location), Comment etc. may be entered via a Keyboard and/or Scanner.

Records are stored permanently in the **Pro Logger II** until they are deleted on mass by the user. Each test record is appended to the last to ensure there is no accidental loss of data.

Each test saved may contain between 1 and 3 records dependent upon changes made to the header record or the addition of a comment record.

Records Uploaded from the **Pro Logger II** to a PC may be imported directly into a Spreadsheet or any application capable of accepting comma delimited (CSV) files.

### Operation

Data Logging may be switched On or Off via the Utilities Menu. The Utilities Menu is accessed by pressing F2 while the Start Prompt is displayed on the LCD Display (this menu provides access to all options associated with the Data Logger). Any single Utilities Menu option is selected by scrolling up (F1) or down (F2). To select the option press "Start" and to exit the menu press "Reset".

The keys on the front panel of the **Pro Logger II** are mimicked by the keyboard i.e. pressing "o", "e", "d", "l" will select the *Other Appliance menu*, and *Earthed Appliance*, *Double Insulated* and *Leads* tests; "Esc" will Reset; "Enter" will Start; "y" Yes, "n" No; and "F1", "↑" & "F2", "↓" will mimic F1 & F2.

**Note 1:** For tests initiated via the keyboard, the "Enter" key must be pressed twice.

**Note 2:** When using Data Logging, it is important to ensure the correct Time and Date values are set prior to commencing testing. Set the Time and Date via the Utilities Menu in a 24 Hr clock format.

With the speed and ease of testing in mind, the **Pro Logger II** has been designed to allow a user the flexibility to turn on or off the prompting for particular field information. If the prompt is turned off then the user will only have to enter data once for some fields and never for others.

For example if *Ask for Venue* is turned off then the **Pro Logger II** will only ask once for the Company name, Site & Location. Also if *Ask for Comment* is turned off the **Pro Logger II** will never display the Comment Prompt unless a test fails.

## Data Logger operating Instructions (continued)

Data entry may be via the Flexible Keyboard; or Scanner and Keyboard.

**Note:** When using the Scanner together with the Keyboard, connect the Keyboard to the Scanner's "Keyboard Wedge Cable" via the PS/2 connection

Connecting the keyboard and scanner via separate USB ports will occasionally cause the keyboard to send spurious characters to the **Pro Logger II** while scanning barcodes.

If the scanner is used without a keyboard then it must have an "Enter" as a barcode terminator (see section entitled "Scanner setup").

Prompts for fields such as Company, Site and Location (The Venue) appear only after initiating a test. The prompt for Tag Number appears at the conclusion of a successful test, except in the case of RCD tests. For RCD tests the Tag Number is entered prior to the test. If the Electrical Test is unsuccessful the Tag Number is not stored.

If a test fails a visual inspection and the visual inspection prompt is turned on, then the electrical test is skipped and the user is prompted for a Comment.

If a test fails due to an electrical failure the user is prompted for a Comment instead of a Tag Number. The Comment maybe skipped if not required.

A warning in the form of the memory usage screen will appear if there are 10 or less records left in memory. For each test performed at that point, the reset button will have to be pressed to exit the message and continue the test. After the memory is full the **Pro Logger II** will continue to perform electrical tests but there will be no data recorded. At this point the current stored test results should be uploaded to a PC and then deleted from the memory via the Utilities Menu.

The number of records used and the memory capacity (DL500, DL1000 or DL2000) can be displayed by pressing F1 while the Start Prompt is displayed on the LCD Display. The F1 key will also display details relating to the Time and Date; and the Software and Hardware versions installed in the **Pro Logger II**. Pressing the reset button will return you to the Start Prompt. When using the Utilities Menu to upload stored data to a PC the number of records used and the overall memory capacity is also displayed.

### Utilities Menu options (applicable to Data Logging)

Upload Test Results	Transfers all stored data from the STC to a PC
Delete Test Results	Deletes all test results stored in the STC
Data Logging On/Off	Turns the Data Logging function On or Off
Ask for Venue	Company Turns prompt for the Company On or Off. If it is turned off it still must be entered on the first test. Field may not be empty.
	Site Turns prompt for the Site On or Off. If it is turned off it still must be entered on the first test. Field may not be empty.
	Location Turns prompt for the Location On or Off. If it is turned off it still must be entered on the first test. Field may not be empty.
Ask for Technician	Turns prompt for the Technician On or Off. If it is turned off it still must be entered on the first test. Field may not be empty.
Ask for App Number	Turns prompt for the Appliance Number On or Off. Field may not be empty.
Ask for Visual	Turns prompt for the Visual Pass/Fail On or Off. If set to On the field may not be empty.
Ask for Tag Number	Turns prompt for the Test Tag Number On or Off. If set to On the field may not be empty.
Ask for Comment	Turns prompt for the Comment On or Off. If it is turned off it will only appear in the case of a failed test.
Set Time & Date	Enables setting of a 24 Hr Real Time Clock (HH:MM DD-MM-YY).

**Note:** If the option is selected then a small square (☐) appears next to the option. Conversely, if the option is deselected then the square does not appear.



## Data Logger operating instructions (continued)

The Data Logger records the following in each data field:

### • Test header

		Field Length (Characters)
Company	Name of Company responsible for the appliances (eg TRIO Smartcal)	16
Site	Specific Site for the above Company (eg Adelaide Office)	16
Location	Specific Location at the Company's Site (eg Workshop)	16
Technician	Name of person conducting the Appliance Testing (eg Rob)	8
Password	(Not implemented)	

**Note:** The above fields occupy one record or row only. A new record is created and stored only if one or more fields are altered.

### • Test detail

DD-MM-YYYY	Date of test	
HH:MM	Time of test (24 Hr Clock)	
Appliance Description	Description of Appliance under test (eg IEC Lead)	16
Appliance Number	Unique Appliance or Asset Number for each appliance	8
Visual Pass/Fail	Records if the appliance passed or failed a Visual Test. If the field is set to off it stores "N" (not used)	1
Tag Number	The Number of the Test Tag adhered to an appliance after a successful test	8
Earth Current	(Not implemented)	
Test Type	0 = Earthed Appliance, 1 = Double Insulated, 2 = Leads, etc (See full table over page)	
Electrical Pass/Fail	Stores a Pass, Fail or Abort dependent on the result for each test	
IR (Insulation Resistance)	Measured Value (M $\Omega$ )	
LC (Leakage Current)	Measured Value (mA)	
ER (Earth Resistance)	Measured Value ( $\Omega$ )	
EC (Electrical Continuity)	(Not implemented)	
RCD trip time (0° crossing)	Measured trip time for an RCD Test for the 0° crossing (mS)	
RCD trip time (180° crossing)	Measured trip time for an RCD Test for the 180° crossing (mS)	

**Note:** The above fields occupy one record or row only. A new record is created and stored after every test.

### • User comment

Comment	User comment field	16
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**Note 1:** The above field occupies one record or row only. A new record is created and stored only if a comment is added to the test.

**Note 2:** Frequency of Test (FoT) Codes may be used in this field. Please refer to the Downloader Manual for detail.



# Data Logger operating instructions (continued)

## Test Type

0	=	Earthed Appliance
1	=	Double Insulated
2	=	Leads
3	=	Class 1 250V
4	=	Class 2 250V
5	=	Class 1 Run Test
6	=	Class 2 Run Test
7	=	Earth only test
8	=	MIMS Run Test
9	=	EPOD 250V
10	=	10mA Portable RCD
11	=	30mA Portable RCD
12	=	10mA Fixed RCD
13	=	30mA Fixed RCD
14	=	PIEZO Run Test
15	=	3 pin Class II Run
16	=	Long Class I Run

## Uploading data to the PC

To transfer data from the *Pro Logger II* to a PC, each STC is shipped with a PC DownLoader utility. This utility enables data transfer from the memory of the *Pro Logger II* to a PC via a USB cable. Instructions relating to the installation and operation of the STC Downloader Program are supplied with the *Pro Logger II* CD.

Records stored in the *Pro Logger II* are uploaded to the memory of a PC by Selecting *Upload Test Results* under the Utilities Menu. The Downloader utility must be running on the PC during this process.

Records stored in the *Pro Logger II* can only be deleted on mass by the user (see Utilities Menu).

The file format is a simple comma delimited (CSV) file. This format is able to be imported in to many applications including Microsoft Excel®.

Stored test records should be uploaded to a PC at the end of each testing session or at regular intervals.

**Note:** The USB cable is supplied with the *Pro Logger II*.

## Keyboard

The *Pro Logger II* has been designed to work with a standard flexible keyboard. The keyboard can be used in parallel with a Scanner.

**Note 1:** While the *Pro Logger II* has been tested with a range of Keyboards, TRIO Smartcal can not guarantee that all makes of keyboards will function with the *Pro Logger II*.

**Note 2:** When using the scanner together with the keyboard, connect the keyboard to the scanner's "Keyboard Wedge Cable" via the PS/2 connection. Connecting the keyboard and scanner via separate USB ports will occasionally cause the keyboard to send spurious characters to the *Pro Logger II* while scanning barcodes.

## Scanner

The *Pro Logger II* has been designed to work with a customised PS2 Barcode Scanner. The scanner can work in parallel with a the flexible keyboard (see Note 2 above).

Should the Scanner's settings be lost for any reason see section entitled "Scanner Setup".

The Scanner supplied as an accessory to the *Pro Logger II* may be used in one of two modes: with or without an "Enter" as a terminator.

See Section "Scanner Setup" to program the scanners.



**Scanner Setup:**

**Cipher Lab 1000 Scanner:**

To setup the TRIO scanner, scan the following barcodes (from "Start" to "End"):







Setup 1: Places a "Enter" at the end of each scanned barcode (Default)

Setup 2: Removes the "Enter" at the end of each scanned barcode


STC Defaults

Auto Return OFF

Start

End



Start









End

Auto Return ON

Start



End

**Note:** While the Pro Logger II has been tested with a range of PS2 Scanners, TRIO Smartcal can not guarantee that all makes of PS2 Scanners will function with the Logger.





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