Wavecom

TnP-500

Portable Appliance Test and Print Kit

User Manual

+ Certificate of Warranty and Product Support Information

Wavecom Certificate of Warranty

Your Wavecom Appliance Tester comes with a conditional 36 month warranty.

Your warranty applies for 12 months from the date of purchase.

This can be extended an additional 12 months if your Wavecom Appliance Tester is calibrated within 12 months of the date of purchase.

This can be extended a further 12 months if you calibrate your Wavecom Appliance Tester a second time within 24 months of the date of purchase.

The Manufacturer (Wavecom Pty. Ltd.) warrants its products against defects in materials and workmanship for a period of 12 months from the date of purchase. During the warranty period, the Manufacturer will repair (or at its option replace at no charge) the product that proves to be defective. This warranty does not apply if the product has been damaged by accident, abuse, misuse or mis-application or as a result of service or modification by anyone other than the Manufacturer of this tester.

The TnT & TnP Product Range of devices or its Manufacturer is not responsible for incidental or consequential damages resulting from the breach of any express or implied warranty, including damage to property and to the extent permitted by law, damages for personal injury. The distributors of this product cannot assume liability or responsibility for any loss of damage resulting from the use of this device.

The Manufacturer reserves the right to discontinue models, change specifications, price or designs at any time without notice or obligation.

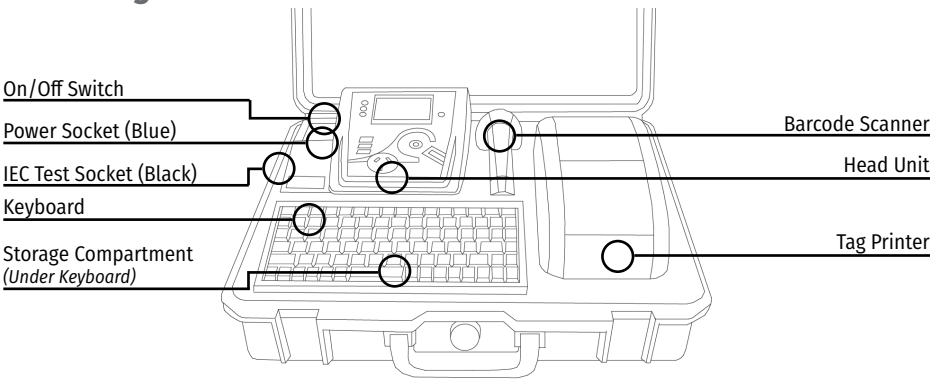
Important Information

Contents

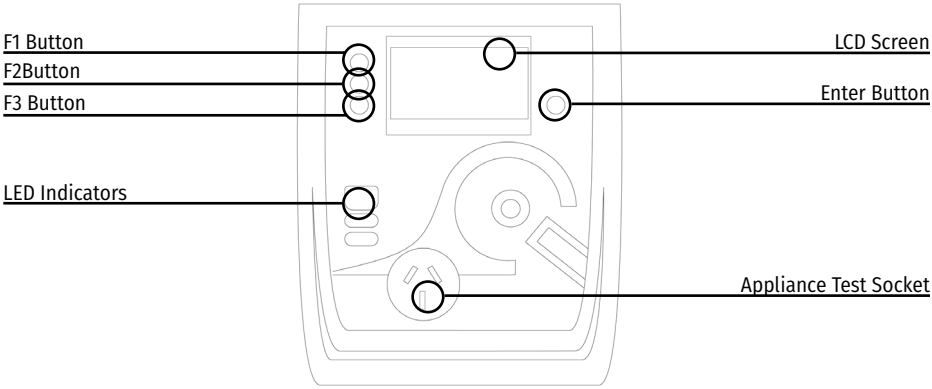
- TnP-500 Integrated Appliance Tester
- Wavecom Thermal Transfer Printer
- Barcode Scanner
- Keyboard
- IEC Power Cable
- IEC Test Lead (500mm Orange)
- Earth Lead with Alligator Clips (1800mm Black)
- USB A to USB B Interface Cable
- Shockproof Industrial Case (IP67 Rated)
- 1 Roll (500) of White Thermal Transfer Tags
- 1 Roll of Printing Ribbon
- 12 Month Calibration Certificate
- 36 Month Conditional Warranty
- User Manual

TnP-500 Diagrams

Case Diagram

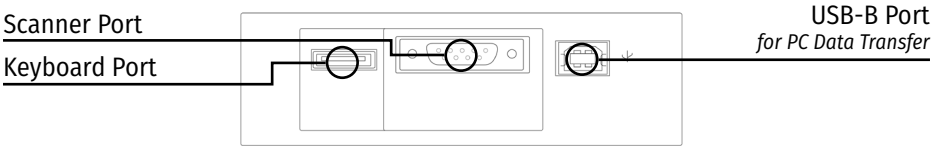


Head Unit Diagram



Storage Compartment Port Panel Diagram

Note: the Keyboard and Scanner ports are wired specifically to work with the included TnP-500 Keyboard and Barcode Scanner, and will not operate as these ports (USB & RS-232) normally would.



Precautions & Safety Information

The TnP-500 has been designed to meet stringent safety requirements, however no device can completely protect you from the consequences of incorrect use. The testing of electrical appliances requires that extra care and caution is taken at all times to ensure personal safety.

The Manufacturer also advises that appliance testing should be conducted by a *Competent Person* who is suitably trained (see AS/NZS 3760:2022 for the definition of *Competent Person*), as well as any additional legislation or rulings in different states. If in doubt, the manufacturer suggests the user contact their responsible authority.

For maximum safety, always ensure that the following advice is followed:

- The equipment being tested is in good condition and passes a visual check.
- All instructions are read, understood and followed.
- The power supply connections are always checked - if the N-E (middle) LED Indicator flashes red, do not proceed before consulting the manual.
- Always use specified fuses and protection devices.
- Do not use leads that require repair or are damaged.
- If you are unsure, call a licensed Engineer/Electrician.

Warnings

Operating Environment: 0° to ~45°C.

Please ensure the unit is stored in compliance with the operating environment requirements and in a safe and secure location.

Replacing Fuses

From time to time an appliance may cause an internal fuse within your TnP-500 to break. When this occurs you will need to replace the fuse. If you prefer you can return your tester to Wavecom and we can replace the fuse for you, or if you wish you may replace the fuse. Contact us if you require information or guidance when replacing a fuse in your TnP-500.

Competent Person

To ensure that all electrical equipment or devices are inspected, tested and tagged correctly, regulations require that a 'competent person' such as a Licensed Electrician be employed to perform the required tests. Please refer to the below definition as described in the current AS/NZS 3760:2022 Standard and in addition, to any other local legislation or jurisdictions as may be relevant in your State.

A person competent to undertake Inspection and Testing of electrical equipment must have:

- Knowledge and practical experience of electricity and its hazards.
- A clear understanding of precautions to avoid danger.
- The ability to recognise at all times whether or not it is safe for work to continue.
- The ability to carry out visual examinations of electrical equipment.
- The ability to distinguish between electrical equipment that is double insulated and equipment that is earthed as well as being able to identify the appropriate test for each type.
- The competency to safely carry out the Earthing Continuity, Insulation Resistance or Leakage Test and RCD tests on electrical equipment.
- The knowledge of how to use the relevant testing instruments, interpret and record the results for compliance with the Standard/Workplace requirements.
- The knowledge to be able to correctly recommend the frequency of testing required.

Due to the potential hazards of electrical testing, due care must be taken at all times.

Important Calibration Information

Your Wavecom Appliance Tester should be calibrated every 12 months. A correctly calibrated tester is essential for ensuring testing accuracy and precision is maintained, and for complying with the AS/NZS 3760:2022 standards.

To book your tester in for calibration, go to:

www.wavecom.com.au/calibrations

Then, send your tester to your nearest calibration service centre:

For Western Australian customers:

Wavecom WA Calibrations
Unit 2/17 Casino Street,
Welshpool, WA 6016

For all other customers:

Wavecom Calibrations
257 Grange Road,
Findon, SA 5023

Upon receipt of your tester you will be notified via email (if provided).

Product Support

At Wavecom we take great pride in our customer service and support. We provide assistance, troubleshooting and support over the phone, via Skype or Facetime, via email or in person to help you get the most from your Wavecom TnP-500. To be eligible for our support services, register your Wavecom product.

You can register via our website: **www.wavecom.com.au**

WinPATS

WinPATS is our cutting edge software solution for appliance testing. Offering an integrated testing, management and reporting environment that exceeds the new AS/NZS 3760:2022 standards, designed specifically to link seamlessly between your TnP-500, optional tablet, and online cloud storage, WinPATS can revolutionise the way you run your PAT Testing operations.

We recommend using WinPATS to access the full range of features of your TnP-500, especially if you conduct testing across multiple sites, or have multiple technicians conducting testing within your organisation.

To learn more about WinPATS, scan the QR code or visit **www.winpats.app**

Instructions for setting up WinPATS can be found on pages 9 and 10.

Scan to visit www.winpats.app

Operating your TnP-500

Powering on the Tester

Before powering on the TnP-500, ensure all test cables (such as the Alligator Lead and Orange IEC lead) are removed, and that all your peripherals (such as the keyboard, barcode scanner and printer) are connected.

Connect your TnP-500 to mains power via the supplied power lead, then turn the Power switch on.

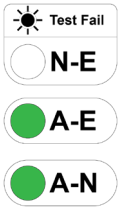
Your TnP-500 will begin in Memory Mode, which allows you to store test results and item information in the TnP-500's memory, print tags, and use the other useful features of the TnP-500, in addition to the general appliance testing functions.

To start your TnP-500 in Tester mode, which only allows you to conduct tests without saving results, press and hold F3 while turning your TnP-500 on. Your TnP-500 will also start in Tester mode if no peripherals (such as the keyboard, barcode scanner and printer) are connected.

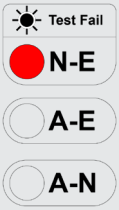
The Barcode scanner will beep when your TnP-500 is powered on, indicating that it is also powered. If you do not hear a beep from the scanner, check the scanner connection.

Initially the printer's status light will be orange but after about 5-10 seconds it will change to green. The tester will not print unless the printer light is solid green. A flashing red status light can indicate a media or general printer fault (see 'Wavecom Thermal Transfer Printer' for more information).

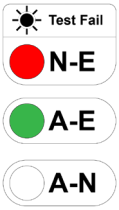
Status LEDs



Standard Mains Supply Test result with no issues.



N-E Fault - If the N-E light in on, DO NOT PROCEED. The N-E LED will turn red if there is a voltage difference between the neutral and earth, or if there is no earth connected. If you are working from a generator or inverter this is likely to occur - consult a qualified electrician before proceeding.



If the N-E LED is red, and A-N is green, there is a fault with the Mains Supply. Consult a qualified electrician.

You may also see more than one, or all of these turn red. For more information, see Mains Supply Test (Page 33).

Using your TnP-500 with WinPATS

Using WinPATS on an Android Tablet

If you have an Android tablet, you can use WinPATS Pro to control your TnP-500 via Bluetooth, build a database of items and test results, create reports, and more. For more information on using WinPATS Pro, scan the QR code to view our setup tutorial video.

Scan to view our Tutorial Video on this topic

Using WinPATS Web Manager via Web Browser

You can connect your TnP-500 to WinPATS Web Manager using Bluetooth. Your TnP-500 includes a 12 month free subscription to WinPATS, including a Cloud Subscription and Web Manager access. Review the flyer enclosed with your TnP-500 for more information to redeem this often.

Conduct your testing manually, using the TnP-500's onboard system for adding sites, items, and conducting tests. Once your testing is complete, you can upload your data to WinPATS Web Manager.

1. Set Up Your WinPATS Account

1. Scan the QR Code or visit **www.winpats.app** using **Google Chrome** and click on Manager Login, then click 'Register New Company Account'.
   If you already have an existing WinPATS Company Account for your organisation, you can click 'Register a new WinPATS Webapp User' and then proceed to section 3 - Transfer Your Test Data to your TnP-500.
2. Follow the prompts to create your WinPATS Company Account and User Profile.
   See the leaflet enclosed with your User Manual for more details.

Scan to visit www.winpats.app

2. Migrate Your Data To WinPATS

If you do not have any existing test data to import into WinPATS, you can proceed to section 4 - Conduct Your Appliance Testing.

1. If you have asset or test data you want to import into WinPATS, navigate to the 'Database' menu on the left of screen, click 'Inventory & Reports', then click 'Import'.
2. Download the CSV template, then copy and paste your data from your existing database into the WinPATS CSV template.
3. Once you have transferred your existing database into the CSV template, return to WinPATS and then click 'Import From CSV'. Select your file then click upload.
4. Your assets will be imported into WinPATS. These will be available to all your Users.

Continued on page 10

3. Transfer your test data to your TnP-500

Please note: You can only store 5,000 items on your TnP-500 at a time. If you have more than 5,000 items you will have to filter your items to transfer your test data to your TnP-500.

1. WinPATS Web Manager supports data upload and download to your TnP-500 onboard memory.
   This process is only supported when using **Google Chrome on a Windows PC.** This requires a SiLabs Communications Driver which can be downloaded from our website.
   Navigate to www.wavecom.com.au, then click on '*Purchasing & Support*', then '*Download Software*', then click on '*USB To USB Communications Driver SiLabs - Windows 7, 8, and 10 (For TnT PAT Testers with inbuilt USB connectors)*'. The driver will download; run the downloaded file to install the driver.
2. Navigate to the 'Database' menu on the left of your screen, then click 'Inventory & Reports', then click 'Import'. Select 'Prepare for TnP-500'. Then, click 'Upload to TnP-500' and follow the prompts.
3. Connect your TnP-500 to your PC by connecting the USB cable from your TnP-500 USB-B socket under the keyboard, to a USB port on your PC. Your data will be uploaded to the TnP-500. You can now begin testing your items.

4. Conduct your Appliance Testing

1. Add or update items in your database, conduct tests, and save your results to your TnP-500's onboard memory.

5. Transfer your test data from your TnP-500 to WinPATS Web Manager

1. You can import your data after you have finished testing by connecting your TnP-500 to your PC, then selecting 'Import From TnP-500' from the same menu used in Step 3.

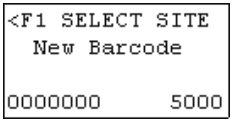
6. Manage Your Test Data

1. Now that your items and test results are imported to WinPATS Web Manager, you can update your item's details, create reports, export your data as a CSV, and more.
2. When you are ready to conduct more testing, follow the directions in section 3 to transfer your next batch of items to be tested to your TnP-500.

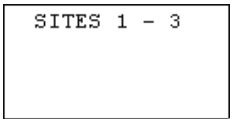
Using the TnP-500

The TnP-500 has a basic operating system that allows you to store User information, Sites and Items, as well as access this information to retest Items, and export this data using WinPATS Pro Web Manager, our browser based asset management solution.

Scan to view our Tutorial Video on this topic

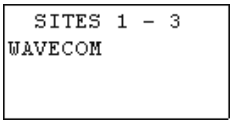


The TnP-500 can hold up to 16 sites. To save items and test results, you will need at least one Site added to the TnP-500's memory. Press F1 to add or select a site.



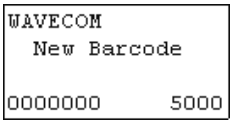
The TnP-500 can hold up to 16 sites. Press Enter to scroll through your sites. Each site on screen corresponds to an "F" key, for example Site 1 = F1. To add a new site or edit an existing site, hold the corresponding "F" key for 2 seconds.

If the Site has an asterisk (*) symbol next to the name the site was uploaded from WinPATS, and should not be edited.



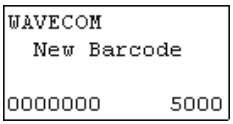
Using the keyboard, enter the name of the site. Once the details have been typed in press Enter to return.

Once a site has been entered, the 'F' buttons are used to select the site. For example to select site 1, press F1.



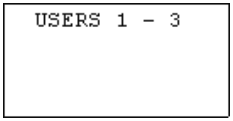
Once a site has been selected, the TnP-500 will return to the initial screen and the site that was selected will be shown in the top left hand corner of the screen.

Adding a User

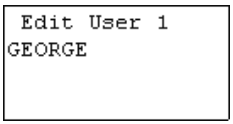


The TnP-500 can store up to 6 different Users. To save items and test results, you will need to add at least one User.

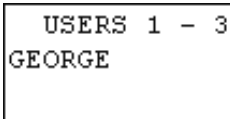
From the initial screen, press F2 to access the Users menu.



Press Enter to scroll through the Users. 3 Users will be shown on each screen. Each User corresponds to an "F" key, for example User 1 = F1. To add a new user or edit an existing user, hold the corresponding "F" key for 2 seconds.

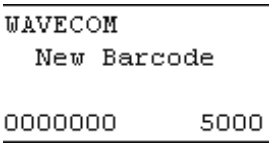


Using the keyboard, enter the name of the site. Once the details have been typed in press Enter to return.



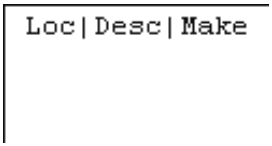
Once a user has been entered, the 'F' buttons are used to select the user. For example, to select user 1, press F1.

Adding & Testing an Item



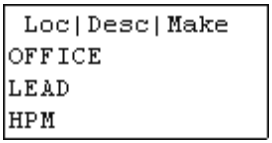
To add a new item, you must first set a unique barcode. Press F3 to generate the next barcode in sequence (1001, 1002, 1003 etc.) or type in the new barcode using the keyboard.

If the screen displays "Search Barcode", press Enter to switch to 'New Barcode'. There must be no numbers entered to switch between the two modes.



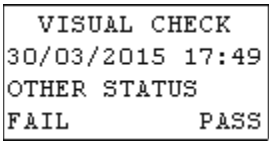
A selection of details (location, description, make, model, serial number, asset number, frequency of test and notes) can be entered for an item.

Each heading relates to a Function Key; e.g. F1:Location; F2:Description ; F3:Make. To scroll through the various detail pages, press Enter.



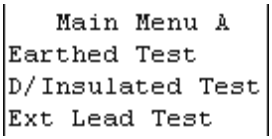
To select a detail, press the corresponding F key. Use the keyboard to enter in the information, then press Enter. *The Location, Description, and Test Frequency details must be filled before proceeding.*

Once the details are entered, **hold Enter for 2 seconds** to move on to the visual check screen.



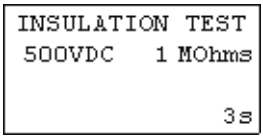
After the item, has been visually inspected, there are 3 options that can be selected; Out of Service (F2), Fail (F3) and Pass (Enter). If Out of Service or Fail is selected the result will be saved and the TnP-500 will print a tag and return to the barcode entry screen.

If the test is a visual check only then hold Enter for two seconds to create a Visual Test Pass result.

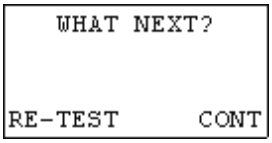


If the item passes a visual inspection you can proceed to testing. Select the correct test sequence based on the appliance type.

See page 30 for more detail.



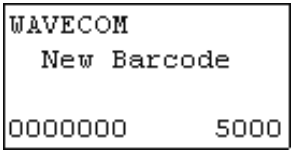
Once test has been completed the results are displayed.



To test the item again, press (F3). This will take you back to the main menu A screen. You may need to use this function when testing multi-outlet power boards for instance.

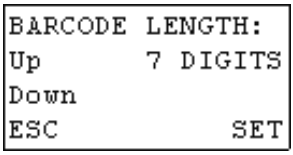
To complete the test, press enter. This will take you back to the new barcode screen, and a tag will be printed.

Barcode Generation



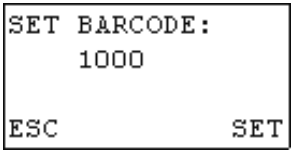
The TnP-500 incorporates an auto generate barcode function which allows barcodes to be generated sequentially after a barcode has been specified, for example: the specified barcode is 1000 so the next barcode to be generated will be 1001, then 1002 etc.

You can adjust the Barcode Generation settings by holding F3 for 2 seconds on the Barcode Entry screen.



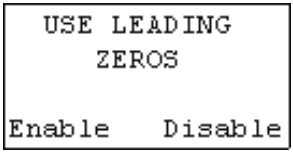
Once the Barcode Generation menu has been accessed, you can specify how many digits they want in the barcode. The auto generate function allows a minimum of 2 and a maximum of 7 digits in the barcode to be generated.

To increase the number of digits in the barcode, press F1. To decrease the number of digits in the barcode, press F2. To proceed, press enter, or to return to the Barcode Entry screen, press F3



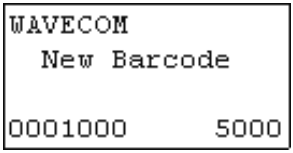
You can then set the barcode that will begin the sequence.

Enter a barcode using the keyboard, then press Enter to continue, or F3 to return the Barcode Entry screen without setting a barcode.



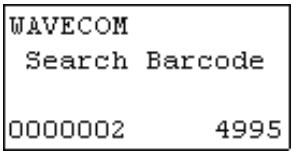
You can then can specify whether or not to use leading zeros in the auto generated barcode. For example: if you selected 7 digits in the barcode and entered 1000 as the original barcode, the barcode will generate as 0001000 if leading zeros are enabled, or 1000 if leading zeros.

To enable leading zeros, press F3. To disable, press enter. The current barcode that will be generated is displayed in the bottom left hand corner of the Barcode Entry screen.

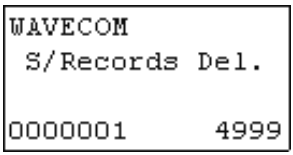


The current barcode that will be generated is displayed in the bottom left hand corner of the Barcode Entry screen.

Deleting Items

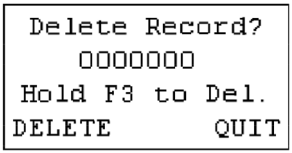


From the search barcode screen press and hold the Enter key. Then press the F1 key. The feature cannot be selected when new barcode is displayed.



The search barcode will change to 'S/Record Del'.

Scan or type the barcode that needs to be deleted. If the record does not exist or is in the wrong site a message will be displayed saying nothing was found.

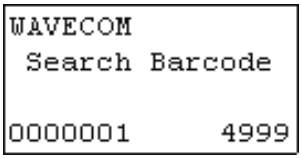


When a match is found a last warning message will be displayed.

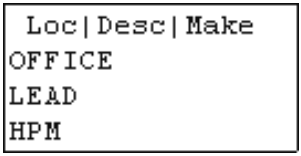
To delete the record hold the F3 key for 2 seconds.

To cancel press Enter.

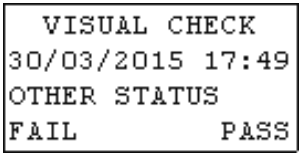
Retesting Items



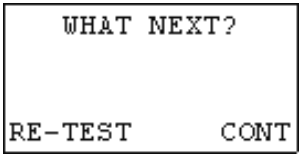
Navigate to the 'Search Barcode' screen by pressing Enter, then type in or scan the barcode number to be searched and press Enter.



The existing record details will be shown. Any changes made here will be updated once the site is downloaded in WinPATS. If nothing needs changing, hold the Enter key to proceed to the next screen.



After all item details have been entered, hold the Enter key for 2 seconds to proceed to the Visual Check screen. Follow the same process as when testing an item for the first time.

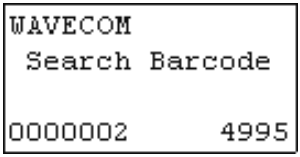


If the item passes a visual inspection and pass is selected, testing can begin.

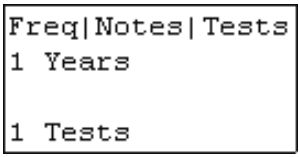
Once test has completed the results are displayed.

To complete the test and print a tag press Enter.

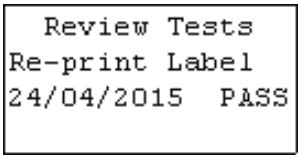
Reprinting a Tag without Retesting



From the search barcode screen, enter barcode to search (From settings, advanced search options can be enabled). Select the Select the record. Press and hold Enter till screen with Loc | Desc | Make, press Enter, Model | SN | Asset, Press Enter one more time to bring Freq | Notes | Tests



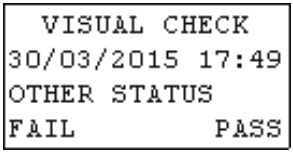
The search barcode will change to S/Record Del. Scan or type the barcode that needs to be deleted. If the record does not exist or is in the wrong site a message will be displayed saying nothing was found. Press F3



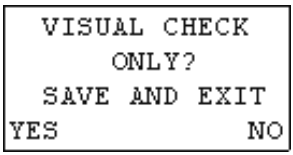
Press re-print the label.

Use Esc key to get back to previous menu when printing is done

Visual Check Only



Items can be passed with a visual check only (no testing required). You must be at the visual check screen shown on the left. To do a visual check only press and hold Enter for 2 seconds.



Pressing (enter) will take you back to the visual check screen. Pressing (F3) will complete the test and print a tag.

You will then return to the New Barcode screen.

TnP-500 Testing Menu – Main Menu A

Class I Test - Earthed Appliances

You Will Need:

- Device Under Test
- IEC Earth Clamp Cable
- Metal Mesh Braid or Cloak
  (if not possible to connect IEC Earth Clamp to exposed metal on Device Under Test)

Test Sequence:

- Earth Bond Test (@ 200mA):
  Pass level less than 1Ω
- Insulation Test (@ 250V or 500V)
  Pass level greater than 1MΩ
- Mains Supply Test
- NCNT Check

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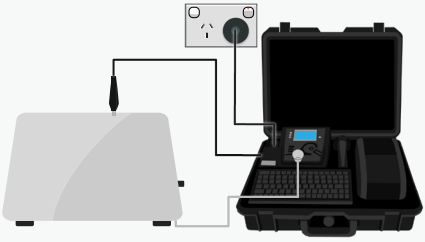
Test Procedure



1. Complete a Visual Inspection.
2. Plug device into appliance test socket.
3. Plug the IEC Earth Clamp Cable into the IEC Test socket.
4. Connect the IEC Earth Clamp to any exposed metal on the device. If this is not possible, you can wrap a metal mesh braid or cloak around the Device Under Test, and attach the IEC Earth Clamp to that in order to establish an earth connection
5. If you are using WinPATS Pro, add the item to your database, select the 'Class I Test' sequence, then tap 'Start Test'.
   Otherwise, navigate to Main Menu A, then Press the F1 key to begin the test
6. The test will be conducted
7. Once complete, you can save your results and print your tag

If the result was a **PASS** - Tag with PASS tag showing "next test due" date and return the device to service.

If the result was a **FAIL** - Tag with a DANGER tag and remove the device from service.

Further Information

Note: Ensure that the device is isolated from any ground loop.

If the Device Under Test is labelled with "Surge Protection Fitted" or if it contains MOV's (Metal Oxide Varistors), conduct a 250V Insulation Test. You can select between 250V and 500V when adding your item to your WinPATS database. If you are operating your TnP-500 without WinPATS, refer to the Settings section to change the Insulation Test voltage. If unsure refer to AS/NZS 3760:2022. Always read the compliance plates before testing, especially on surge protected powerboards.

Class II Test - Double Insulated Appliances

You Will Need:

- Device Under Test
- IEC Earth Clamp Cable
- Metal Mesh Braid or Cloak

Test Sequence:

- Insulation Test (@ 250V or 500V)
  Pass level greater than 1MΩ
- Mains Supply Test
- NCNT Check

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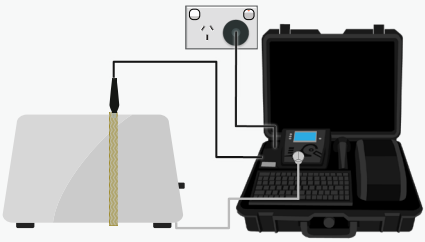
Test Procedure

1. Complete a Visual Inspection, and inspect the compliance plate to ensure the appliance is a Class II appliance. Look for the double insulated symbol: 
2. Plug the Device Under Test into appliance test socket.
3. Plug the IEC Earth Clamp Cable into the IEC Test socket.
4. Wrap a metal mesh braid or cloak around the Device Under Test
5. Attach the IEC Earth Clamp to the braid or cloak



6. If you are using WinPATS Pro, add the item to your database, select the 'Class II Test' sequence, then tap 'Start Test'.
   Otherwise, navigate to Main Menu A, then Press the F2 key to begin the test
7. The test will be conducted
8. Once complete, you can save your results and print your tag

If the result was a **PASS** - Tag with PASS tag showing "next test due" date and return the device to service.

If the result was a **FAIL** - Tag with a DANGER tag and remove the device from service.

Further Information

If the Device Under Test is labelled with "Surge Protection Fitted" or if it contains MOV's (Metal Oxide Varistors), conduct a 250V Insulation Test. You can select between 250V and 500V when adding your item to your WinPATS database. If you are operating your TnP-500 without WinPATS, refer to the Settings section to change the Insulation Test voltage. If unsure refer to AS/NZS 3760:2022. Always read the compliance plates before testing, especially on surge protected powerboards.

Lead Test - Extension Leads & Power Boards

You Will Need:

- Device Under Test
- Orange IEC-550 Cable

Test Sequence:

- Earth Bond Test (@ 200mA)
  Pass level less than 1Ω
- Insulation Test (@ 250V or 500V)
  Pass level greater than 1MΩ
- Continuity and Polarity Test (240VAC @ 2mA)
  Checks continuity & polarity of leads
- Mains Supply Test
- NCNT Check

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Test Procedure

1. Complete a Visual Inspection
2. Plug the Orange IEC-550 Lead Cable into the IEC socket
3. Plug the male end of the Device Under Test into the appliance test socket
4. Plug the IEC-550 Lead into the socket of the Device Under Test
5. If you are using WinPATS Pro, add the item to your database, select the 'Ext. Lead Test' sequence, then tap 'Start Test'.
   Otherwise, navigate to Main Menu A, then Press the F3 key to begin the test
6. Once complete, you can save your results and print your tag

If the result was a **PASS** - Tag with PASS tag showing "next test due" date and return the device to service.

If the result was a **FAIL** - Tag with a DANGER tag and remove the device from service.

Further Information

Extension leads should always be uncoiled before using or testing.

Please ensure that the IEC Adaptor & the IEC socket are inserted firmly or it may result in a continuity/polarity fail.

Each socket of a multi-adapter, power board, or other device with multiple sockets should be tested individually in order to PASS the device.

TnP-500 Testing Menu – Main Menu B

Use the Enter button to switch between Menu A and Menu B.

Power Test - Any Appliance

You Will Need:
- Device Under Test

Test Sequence:
- Power Test
- Mains Supply Test
- NCNT Check

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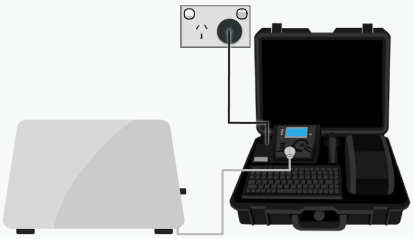
Test Procedure

CAUTION
This test will power on the Device Under Test. Take due care to ensure the Device is safely located before proceeding.

1. Complete a Visual Inspection
2. Plug the Device Under Test into the Appliance Test Socket
3. If you are using WinPATS Pro, add the item to your database, select the 'Power Test' sequence, then tap 'Start Test'. Otherwise, navigate to Main Menu B and press F1 to start the power test
4. A warning message will appear on screen. If the appliance is safely located and secured press F3 to proceed. The unit will power on
5. Read and record results appropriately.
6. Once the appliance has powered down and the test is complete, unplug the unit.



Note: Because the power test is not specified in the AS/NZS 3760:2022 standard, there is no pass/fail value built in to the tester. It is up to the user to determine if the item is a pass or a fail based on the compliance/name plate.

Further Information

The Power Test feature is for single phase appliances only. The Power Test allows the user to power an appliance observe real time measurerments. A Power Test can measure: Volts AC, Current, Volt Amp, Power Factor, and Watts. These readings can be compared to the stated values on the Device Under Test's compliance plate to check compliance.

Earth Leakage Test - Class I

You Will Need:

- Device Under Test
- IEC Earth Clamp Cable
- Metal Mesh Braid or Cloak
  (if not possible to connect IEC Earth Clamp to exposed metal on Device Under Test)

Test Sequence:

- Earth Bond Test (@ 200mA):
  Pass level less than 1Ω
- Insulation Test (@ 250V or 500V)
  Pass level greater than 1MΩ
- Earth Leakage Test
  0 to 30.0mA at 200-265V. 240VAC Mains.
  Pass level 5.0 mA
- Mains Supply Test
- NCNT Check

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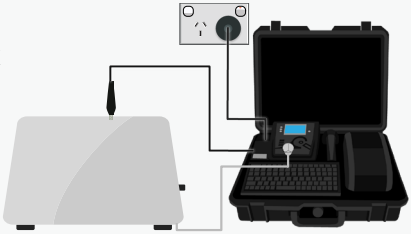
Test Procedure

CAUTION
This test will power on the Device Under Test. Take due care to ensure the Device is safely located before proceeding.



1. Complete a Visual Inspection
2. Plug the IEC Earth Clamp Cable into the IEC Test socket.
3. Plug the Device Under Test into the Appliance Test Socket of the TnP-500
4. Connect the IEC Earth Clamp to any exposed metal on the device. If this is not possible, you can wrap a metal mesh braid or cloak around the Device Under Test, and attach the IEC Earth Clamp to that instead.
5. If you are using WinPATS Pro, add the item to your database, select the 'Class I Leakage' sequence, then tap 'Start Test'
   Otherwise, navigate to Main Menu B, then press F2 to enter the Leakage Test Menu, then press F1 to select Class I Leakage Test
6. The TnP-500 will conduct the first part of the test without powering the appliance
7. A warning will be displayed on screen - ensure the appliance is safely located, then proceed with the leakage test
8. Your results will appear on the screen - you can now print the tag and unplug the appliance

If the result was a **PASS** - Tag with PASS tag showing "next test due" date and return the device to service.

If the result was a **FAIL** - Tag with a DANGER tag and remove the device from service.

Earth Leakage Test - Class II

You Will Need:

- Device Under Test
- IEC Earth Clamp Cable
- Metal Mesh Braid or Cloak

Test Sequence:

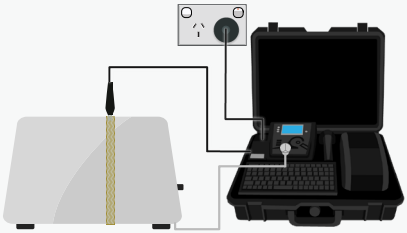
- Insulation Test (@ 250V or 500V)
  Pass level greater than 1MΩ
- Earth Leakage Test
  0 to 30.0mA at 200-265V. 240VAC Mains.
  Pass level 1.0 mA
- Mains Supply Test
- NCNT Check

Scan to view our Tutorial Video on this topic

Test Procedure

CAUTION
This test will power on the Device Under Test. Take due care to ensure the Device is safely located before proceeding.

1. Complete a Visual Inspection
2. Plug the IEC Earth Clamp Cable into the IEC Test socket.
3. Plug the Device Under Test into the Appliance Test Socket of the TnP-500
4. Wrap a metal mesh braid or cloak around the Device Under Test, and attach the IEC Earth Clamp to that in order to establish an earth connection



5. If you are using WinPATS Pro, add the item to your database, select the 'Class II Leakage Test' sequence, then tap 'Start Test'
   Otherwise, navigate to Main Menu B, then press F2 to enter the Leakage Test Menu, then press F1 to select Class II Leakage Test
6. The TnP-500 will conduct the first part of the test sequence without powering the appliance
7. A warning will be displayed on screen - ensure the appliance is safely located, then proceed with the leakage test
8. Your results will appear on the screen - you can now print the tag and unplug the appliance

If the result was a **PASS** - Tag with PASS tag showing "next test due" date and return the device to service.

If the result was a **FAIL** - Tag with a DANGER tag and remove the device from service.

Earth Leakage Test - RCD

You Will Need:

- Device Under Test
- IEC Earth Clamp Cable
- Metal Mesh Braid or Cloak

Test Sequence:

- Earth Bond Test (@ 200mA):
  Pass level less than 1Ω
- Earth Leakage Test
  0 to 30.0mA at 200-265V. 240VAC Mains.
  Pass level 1.0 mA
- Mains Supply Test
- NCNT Check

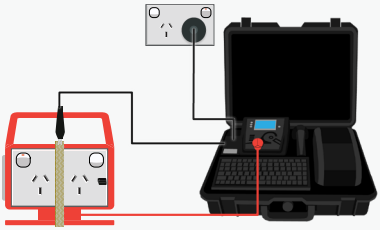
Scan to view our Tutorial Video on this topic

Test Procedure

CAUTION

This test will power on the Device Under Test. Take due care to ensure the Device is safely located before proceeding.

1. Complete a Visual Inspection. .
2. Plug the IEC Earth Clamp Cable into the IEC Test socket.
3. Plug the male end of the Device Under Test into the appliance test socket.
4. Wrap a metal mesh braid or cloak around the Device Under Test, and attach the IEC Earth Clamp to that in order to establish an earth connection



5. If you are using WinPATS Pro, add the item to your database, select the 'RCD Leakage' sequence, then tap 'Start Test'.
   Otherwise, navigate to Main Menu B, then press F2 to enter the Leakage Test Menu, then press F3 to select RCD Leakage Test.
6. The TnP-500 will conduct the first part of the test without powering the appliance
7. A warning will be displayed on screen - ensure the appliance is safely located, then proceed with the leakage test
8. Your results will appear on the screen - you can now print the tag and unplug the appliance

If the result was a **PASS** - Tag with PASS tag showing "next test due" date and return the device to service.

If the result was a **FAIL** - Tag with a DANGER tag and remove the device from service.

Further Information

The Leakage Test is an alternate method to perform insulation resistance tests. There are three types of Leakage test available on the TnP-500 - take care to ensure you use the correct test for your appliance.

This test determines errors of leakage not otherwise detected in a normal insulation test. If there are any doubts with insulation testing of the equipment, the Standard (AS/NZS 3760:2022) allows for a leakage test to be carried out instead. The Leakage Test applies power to the Device Under Test and measures any imbalance or leakage current. The leakage is tested to the limits of the class types specified in the Standard AS/NZS 3760:2022.

The limit of imbalance measured on the TnP-500 will read well in excess of the limits set in mA. However, should the supply circuit be protected by an RCD this device will trip anywhere between 10 to 30mA and trip the mains supply switch OFF. The Leakage Test allows the user to operate the appliance in normal operation conditions and measure its Operating Leakage current. The displayed parameter is mA. The mA Display Range 0.0 to 22.0 mA.

A predefined value for individual class types is programmed into your TnP-500. These limits are set according to the AS/NZS 3760:2022. Should these values change in future it can be simply altered in firmware. The run time period can be adjusted (by 5 second increments). The value can be changed by selecting the leakage test time in the Settings menu, or via WinPATS. The factory default setting is 20seconds, which is generally long enough to obtain an accurate reading for most appliances.

RCD Leakage Test

Please note that the RCD Leakage Test is not an alternative to an RCD Trip Time or Ramp Current Test. The RCD Leakage Test measures only the earth bond and earth leakage of a Residual Current Device, and should not trip an RCD that is functioning correctly.

RCD Tests - Portable & Fixed Residual Current Devices

Types of RCD

There are two types of RCD - Type 1 and Type 2:

Type 1 RCDs have a trip time of < 40mS and a trip current of < 10mA. These types of RCDs are mainly used on sites containing medical equipment. These types of RCDs must be compliant with AS/NZS 3551.

Type 2 RCDs have a trip time of < 300mS and a trip current of < 30mA. These types of RCDs are generally more commonplace. All Wavecom Appliance Testers are set to test Type 2 RCDs by default.

Adjusting Test Parameters For RCD Type:

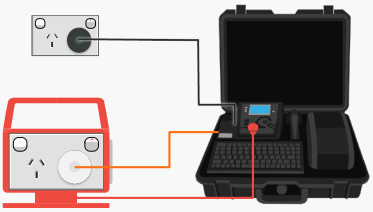
If you are using WinPATS, you can simply select the appropriate test for your RCD type (RCD Trip Time 10mA for Type 1, RCD Trip Time 30mA for Type 2). You will be able to set Portable RCD (pRCD) to on or off. If you are testing a Portable RCD with a physical switch turn pRCD on, otherwise turn pRCD off.

If you are conducting testing directly from your TnP-500, you can adjust the RCD testing options from the RCD Testing Menu. After setting your RCD type, you will be promoted to enable or disable (pRCD) testing. If you are testing a Portable RCD with a physical switch turn pRCD on, otherwise turn PRCD off.

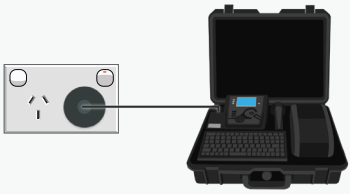
RCD Testing Setup

When testing RCDs, different kinds of RCDs will require different test setups. Consult the diagrams below to determine which setup is required for your situation.

Testing Portable RCDs with physical switches



Testing Switchboard RCDs



Testing Portable RCDs with no physical switch

Scan to view our Tutorial Video on this topic

RCD Trip Time Test

You Will Need:

- Device Under Test
- IEC-550 Orange Cable
  For portable RCDs with a physical switch
- Wavecom Isolation Transformer
  For portable RCDs without a physical switch

Test Sequence:

- Trip Current
  Injects fixed trip current (User selectable from 2-500mA in 1mA increments)
  Measures Trip Time (0 to 3,000ms at 1ms resolution)
- Mains Supply Test
- NCNT Check

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Test Procedure

1. Complete a Visual Inspection
2. Set up your test according the the variety of RCD you are testing (see page 24)
3. If you are using WinPATS Pro, add the item to your database, select the 'RCD Trip Time' sequence, then tap 'Start Test'.
   Otherwise, navigate to Main Menu B, and press F3 to enter the RCD Menu, then press F1 to select Time Test. Press F3 to enter the Time Test options menu, to ensure your TnP-500 has the correct settings for the type of RCD. Once your TnP-500 is set up correctly, select either the 0° (Positive) or the 180° (Negative) Phase to test. Both phases should be tested, and after the first test, you can select 'Retest' to test the other phase.
4. When ready, begin the test - the RCD will trip, and the time will be recorded in milliseconds.
5. If the mains power source RCD tripped (either during a switchboard RCD test or a Portable RCD with no physical switch test) your TnP-500 will retain the result using a small onboard battery, but will need to be Mains Powered again to view the test result or conduct further RCD tests.
6. You can now retest the other phase of the RCD, or simply print your tag and record your results.

If the result was a **PASS** - Tag with PASS tag showing "next test due" date and return the device to service.

If the result was a **FAIL** - Tag with a DANGER tag and remove the device from service.

Further Information on next page.

RCD Trip Time Test (continued)

Further Information

This test is designed to trip RCD devices at a fixed current and to determine the trip time of the RCD device. During an RCD Trip Time test, the TnP-500 injects a true fault current value using a real-time compensation calculation of the actual voltage at the time of test, delivering a true and accurate trip current. The TnP-500 will measure the time the RCD takes to trip in milliseconds, and display it on the screen. This function is factory set to 30mA for fast testing, but the user can set the current to 0.5x, 1.0x or 5.0x using the RCD Multiplier.

Nominal Current	**RCD Multiplier**	**Actual Current**	**Expected Result** *(Type 2 RCD)*
30ma	0.5x	15ma	RCD does not trip
30ma	1.0x	30ma	RCD trips
30ma	5.0x	150ma	RCD fast trips

The 1x multiplier is also effective on any set test current of the RCD tester from 5mA to 500mA output.

RCD Test Options:

To adjust the Trip Time test options, navigate to Main Menu B, press F3 to enter the RCD Test Menu, then press F1 to select Trip Time Test, then press F3 . This allows the user to set the trip current level, 5mA to 500mA. The RCD type can also be select here depending whether the unit is a Type I or Type II RCD. From the options menu, press F2 to change the current level and F3 to change the RCD type.

Adjusting the current level:

The TnP-500 displays and maintains the last set trip current value. If the user wishes to change the value of the trip current the following steps enable the changes. Press F2 from the options menu to display test current.

F1 - Raises the trip current in 1mA increments to 500mA. Hold the button and the value will scroll faster the longer it is pressed. Once 500mA limit is reached the value will then loop over and start again from 0mA

F2 - Decreases the trip current in 5mA increments. Hold the button and the value will scroll faster the longer it is pressed. Once 0mA limit is reached the value will then loop over and start again from 500mA.

Enter - Sets the selected current for the next trip time test. The TnP-500 will then return to the current trip time test screen.

RCD Ramp Current Test

You Will Need:

- Device Under Test
- IEC-550 Orange Cable
  For portable RCDs with a physical switch
- Wavecom Isolation Transformer
  For portable RCDs without a physical switch

Test Sequence:

- Trip Current
  Injects incrementing trip current (0-500mA in 1mA increments)
- Mains Supply Test
- NCNT Check

Scan to view our Tutorial Video on this topic

Test Procedure

1. Complete a Visual Inspection
2. Set up your test according the the variety of RCD you are testing (see page 24)
3. If you are using WinPATS Pro, add the item to your database, select the 'RCD Ramp Test' sequence, then tap 'Start Test'.
   Otherwise, navigate to Main Menu B, and press F3 to enter the RCD Menu, then press F2 to select Ramp Test. Press F2 to select your RCD Type (Type 1 or Type 2) and set Portable RCD Testing on or off. You can then press F3 to begin the test.
4. The TnP-500 will increase the current to the RCD until it trips, displaying the current on screen.
5. If the mains power source RCD tripped (either during a switchboard RCD test or a Portable RCD with no physical switch test) your TnP-500 will retain the result using a small onboard battery, but will need to be Mains Powered again to view the test result or conduct further RCD tests.
6. You can now print your tag and record your results.

If the result was a **PASS** - Tag with PASS tag showing "next test due" date and return the device to service.

If the result was a **FAIL** - Tag with a DANGER tag and remove the device from service.

Further Information

This test is designed to trip RCD devices using a ramping up current value, to determine the trip current of the RCD device. This useful test allows the user to determine circuit leakage load/pre-loading of RCD circuit. This can assist in determining nuisance tripping issues (RCD is too sensitive) or determining RCD performance if suspected faulty or inconsistent in performance.

The TnP-500 has a nominal leakage current of 2mA, which should be added to the result of test. For example if your RCD tripped at 22mA, add 2mA to get a result of 24mA trip current.

Meter Mode®

Meter Mode measures electrical parameters such as Volts, Amps, Watts, and Volt/Amps. These electrical parameters will be displayed on screen.

How to use Meter Mode

1. Conduct a visual inspection, and inspect the compliance plate to determine the expected results
2. Plug in the appliance to the appliance test socket on your TnP-500.
3. Ensure the appliance is safely located and secured, as it will be powered during this test.
4. Press and Hold F3 to enter Meter Mode
5. When ready, press F3 to begin Meter Mode, then press F3 to power the appliance.
6. Press F3 to scroll through the options (Volts, Amps, Watts, & Volt/Amps)
7. To end Meter Mode, simply press Enter, then to leave Meter Mode and return to the Menu, press Enter again. Your TnP-500 will remain in Meter Mode when powered off unless your exit Meter Mode.

Explanation of Electrical Parameters

Volts
A volt is the unit used to measure the energy available in the electrical current of a circuit. Voltage controls the available electrical power (wattage).

Amperes (aka Amps)
An amp is the unit used to measure electrical current as it flows past a specified point.

Watts
A watt is the unit used to measure the amount of actual flowing electrical energy.

Volt-Amps
A volt-amp is the unit used to measure the apparent electrical power used by computing equipment. Mathematically, it is expressed as volts multiplied by amps (V*A). Because it represents the amount of energy computing systems may draw from a power grid, Volt-Amp measurements are used to determine the kind of wiring and circuit breakers required to support the computing equipment in question.

Watts
The power drawn by equipment is expressed in Watts or Volt-Amps (VA). The power in Watts is the real power drawn by the equipment. Volt-Amps are called the “apparent power” and are the product of the voltage applied to the equipment times the current drawn by the equipment. Both Watt and VA ratings have a use and purpose. The Watt rating determines the actual power purchased from the utility company and the heat loading generated by the equipment.

Disclaimer

Meter Mode is to be used for quick simple indicative electrical parameter measurements. Providing reasonably accurate readings without the need to carry any other instruments. It is not intended to replace specific, more accurate individual test equipment, nor is its purpose to replace prescribed testing requirements. It in doubt please consult a qualified electrician when unsure or perform proper test procedures.

TnP-500 Specifications

Refer also to the compliance plate on your TnP-500.

Mains Supply Test	Checks Polarity and continuity of mains supply by LED indicators when connected to Mains Power Supply.
Class I ***Earthed Appliances*** *See also: Leakage Test*	NCNT Check: Ensures appliance is plugged in and turned on. Earth Bond Test: 200mA test current. Pass level Less than 1.0 Ω. Measurement: 0.01Ω to 10 Ω. Insulation Test: 500VDC / 250VDC. Pass level Greater than 1M Ω. Measurement: 0.1Ω to 10MΩ.
Class II ***Double Insulated Appliances*** *See also: Leakage Test*	NCNT Check: Ensures appliance is plugged in and turned on. Insulation Test: 500VDC / 250VDC. Pass level greater than 1MΩ. Measurement: 0.1Ω to 10MΩ.
Extension Leads	Earth Bond Test: 200mA test current. Pass level Less than 1Ω. Measurement: 0.01Ω to 10.0Ωs Insulation Test: 500VDC / 250VDC. Pass level Greater than 1MΩ. Measurement: 0.1Ω to 10.0MΩ. Continuity/Polarity Test: 250VAC check continuity and polarity of leads. Displays Pass/Fail.
Leakage Test	Leakage Current: 0 to 30.0mA at 200 to 265V Earth Leakage Test: 240VAC Mains. Pass level 1, 2.5, 5.0 mA leakage test levels with up to 10 Amp load operation **Note 1: Pass level for Class I is 5 mA; pass level for Class II is 1 mA** **Note 2: Leakage test may be performed if for any reason a standard Class I or Class II Test cannot be performed.**
RCD Test	Trip Current: 2 to 500mA in 1mA steps. User selectable. Trip Time: 0 to 3,000ms at .001sec resolution. Current Ramp Trip Test: 0 to 500mA in 1mA increments.
Power Measurement	Leakage Current: 0 to 30.0mA at 200 to 265V Load Current: 0.0 to 10 amps Voltage: 200 to 265VAC Power Factor: 0.00 to 1.00 Apparent Power: 0 to 2400VA Power: 0 to 2400W
Meter Mode®	Green flashing LED denotes MM is engaged Load Current: 0.0 to 10 amps Voltage: 200 to 265VAC Apparent Power: 0 to 2400VA Power: 0 to 2400W
AC Input	110V-240V 50/60Hz
Bluetooth	Bluetooth Low Energy technology with inbuilt antenna.

Technical Information

Visual Inspection

A visual inspection must be undertaken before proceeding to any further AS/NZS 3760 test.

The visual inspection is carried out to ensure there are no physical faults with the appliance before testing. The following list is an example of potential physical faults, but it is not exhaustive and the relevant standards must be consulted to ensure a proper Visual Inspection is undertaken.

- There is no damage or component defects to the accessories, plugs, outlet sockets or connectors (physical).
- There are no cracks or abrasions.
- There are no exposed inner cores or conductors (flexible) and the supply cords are not twisted or distorted.
- Any fuse or other overload protection components (if fitted) are checked.
- All labels, markings and warning indicators (of the maximum load to be connected to the device) are legible and intact.
- The insulation is not damaged in any way i.e. melted, cuts or abrasions. There are no iron filings in the insulation. There is no insulation tape on the lead.
- Any flexible cords and/or leads are effectively anchored (glands and grommets intact).
- All covers or guards are in place and secure as intended by the supplier/manufacturer.
- All safety devices & systems (overload latches & buttons etc.) are in good working order.
- No dust &/or dirt obstructs any exhausts or ventilation outlets.
- All controls are working properly and are secure and aligned.

If The Device Under Test Fails The Visual Inspection:

If any Equipment fails **ANY** of the above, it should be deemed to have **FAILED** the Visual Test, and therefore no other tests need be performed. If this is the case the Equipment should be tagged with a DANGER TAG and removed from service.

Class I (Earthed Appliance) Construction

Single basic insulated and protectively earth equipment

This type of product design provides two safety barriers between all live conductors at dangerous voltages and the equipment user. The provision of basic insulation between exposed metal parts and live parts is the first barrier to provide basic protection against electric shock. The second safety barrier is by the connection of exposed (accessible) conductive (metal) parts to the protective earthing conductor (earth wire) in the fixed wiring of the device/Installation.

The protective earthing terminal of the equipment must be marked with the word “earth” or the symbol “E” or the symbol for Earth Terminal or Protective.

To perform a Class I appliance test, a continuous earth loop must be made between the exposed conductive material (metal) and the TnP-500 appliance tester. This is done by means of connecting the earth lead with the crocodile clip/probe attached to an earth point (metal covered by paint or other coatings will not provide effective connections) and the appliance plugged into the TnP-500 appliance testers' test socket. The Maximum allowable limit is less than 1.0Ω.

Earth Continuity Test - Commonly called Earth Bond Test

The TnP-500 conducts earth continuity tests at approximately 200mA. Continuity tests at higher currents are not required or recommended on certain equipment as this may cause severe damage or premature failure to the Device under test (see AS/NZS 3760:2022).

Unique Earth Bond Test Feature

The Earth Bond test duration can be extended by the user by pushing the ENTER button during the test. This will extent the test time by 30 seconds for each press.

This feature has been incorporated to provide extra time to achieve an adequate physical connection, or confirm any possible intermittent issues. There may be situations where the condition of equipment, coatings applied, or suspect wiring breaks may alter the earth connection path of the device under test. This may save time by prolonging tests instead of conducting multiple iterations of the same test.

Class II (Double Insulated) Construction

Double insulated equipment

This method of construction employs two safety barriers comprising two layers of insulation between dangerous voltages and the user of the equipment. Double Insulated equipment generally comprises of both *Functional* and *Supplementary* insulation.

The first layer of insulation is the Functional Insulation, and is formed around the live conductor.

The second layer of insulation is the Supplementary Insulation. In Class II equipment, protection against electric shock does not rely on basic insulation only, but has additional insulation such as double insulation or reinforced insulation provided, there being no reliance on precautions in the fixed wiring of installation.

Class II equipment is marked with the words "DOUBLE INSULATION" or the symbol:

Note – Reinforced Insulation is a single insulation system with a degree of protection against electric shock, which is equivalent to double insulation.

Testing of Electrical Equipment

Many testing personnel have some reservations in testing sensitive electronic equipment using a 500V DC insulation test, due to the concern of over-voltage causing internal damage.

The TnP-500 can safely test electronic equipment as the tests are carried from Active-Neutral (shorted by a relay inside the tester) to Earth. In this mode no dangerous voltages pass through to the internal components of the Device Under Test ('DUT').

Some changes may be required in certain configurations where fitted surge protection devices (MOV's) in the DUT may cause a failed test result. Applying 500V in this these situations can cause the surge protection devices to trip, therefore conducting the applied voltage to earth, thus showing a failure of insulation. In these instances the test voltage should be changed to 250V, then the DUT should be retested. If the DUT still fails, check with the DUT Operators' Manual or an electrician.

Under these circumstances, it would be difficult for any damage to occur to either the surge protection device or the DUT, as there is insufficient current generated by the TnP-500.

Leakage Test

If there are any doubts with insulation testing of the Device Under Test, AS/NZS 3760:2022 allows for an Earth Leakage Test be performed instead or in addition to a standard Class I or Class II test.

The TnP-500 has a maximum resistive load of 10 amps.

A Leakage Test applies power to the Device Under Test (DUT) and measures the imbalance of leakage current from the DUT between the active and neutral conductors. The leakage is tested to the limits specified in the standard and a Pass/Fail result as well as a digital reading is provided to ensure that the user gains as much information as necessary.

3 Phase Testing

Note: 3 Phase Testing requires a three phase adaptor, sold separately. The TnP-500 cannot perform a 3 Phase Leakage test.

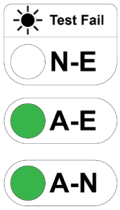
3 Phase appliances can be tested by the TnP-500 appliance testers. As the insulation tests are from Phase to Earth, only a 500V insulation test is required. This test may be carried out by using a Wavecom 3 phase adapter.

Integrated Tests

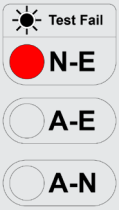
Mains Supply Test

The Mains Supply Test checks the polarity and connectivity of the mains power supply to your TnP-500. This test is conducted passively whenever connected to a Mains Supply, and actively during each test sequence.

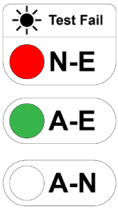
If there is a fault with the mains power connection, you may see one (or more) of the Status LEDs turn red. This may indicate a serious issue with the mains power supply - consult a qualified professional before proceeding.



Standard Mains Supply Test result with no issues.



N-E Fault - If the N-E light in on, DO NOT PROCEED. The N-E LED will turn red if there is a voltage difference between the neutral and earth, or if there is no earth connected. If you are working from a generator or inverter this is likely to occur - consult a qualified electrician before proceeding.



If the N-E LED is red, and A-N is green, there is a fault with the Mains Supply. Consult a qualified electrician.

No Connection No Test (NCNT Check)

This function ensures that the appliance is correctly plugged into the TnP-500 and that it is switched on. If the device is not plugged in and the TnP-500 detects that no device is present, and prompts the user to plug in an appliance to continue the test or press 'QUIT' to return to the main menu.

If for some reason the NCNT check does not detect the device but it is actually plugged in and turned on, the operator can to override the NCNT function. This is done at the user's discretion.

This function ensures that correct testing procedures are carried out in accordance with AS/NZS 3760:2022. If the Device Under Test is not plugged in or recognised, it may require a live test therefore making it necessary for the operator to carry out an Earth Leakage Test.

Note: When using 3-Phase adaptors the NCNT function will need to be overridden. Some single-Phase appliances controlled by contactors will also require manual over ride. In some instances, holding the 'ON' button of the Device Under Test will enable the NCNT function to work normally.

Settings

You can adjust almost all of your TnP-500's settings directly from WinPATS, which we recommend as it offers a easier user interface. In particular, you can change the insulation test voltage and leakage test time directly as part of the testing process.

Accessing the Settings of your TnP-500

To access the Settings Menu of your TnP-500, navigate to Main Menu A, then hold Enter and press F2. You can then scroll through the options by pressing F2, select a setting using Enter, or leave the Settings menu by pressing F3. In general, we recommend leaving these settings at their default values, or adjusting them using WinPATS.

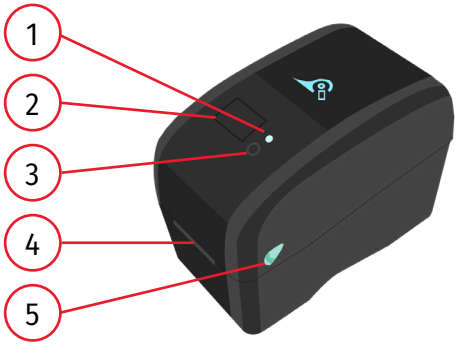
Settings Explanations

Setting Name	Purpose	Possible Values
Change Ins Vol	Adjust the voltage level used in the insulation test.	250V DC *or* 500V DC
Leak. Test Time	Adjust the duration of the leakage test	5 seconds *to* 28,800 seconds *(5 second increments)*
Audio Option	Turn on or off the audible beep to indicate the completion of a test.	Enable *or* Disable
Result Hold Time	Adjust the time that test results are displayed on screen after the completion of a test sequence	1 second *to* 90 seconds *(1 second increments)*
Bluetooth Config	Select whether to enable or disable the security PIN for establishing a Bluetooth connection between your TnP-500 and your tablet.	Enable *or* Disable
	Select whether to formally disconnect the Bluetooth connection when the connection between your tablet and your TnP-500 is interrupted.	Enable *or* Disable
LEDS Options	Set the LED Display Mode of the Status LEDs	TnT Status *or* Mains Detect *or* LEDs Off
	Select whether the Status LEDs should flash to indicate a test is in progress	Enable *or* Disable
	Select whether to use the LEDs to indicate a PASS (green) or FAIL (red) result after a test	Enable *or* Disable

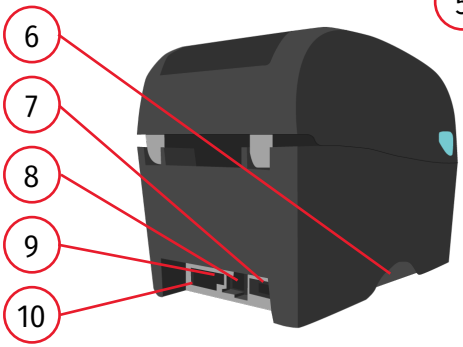
Label Options	Select whether to enable the printer to print labels at the completion of each test	Enable *or* Disable
	Choose which label set (if you are using more than one) to use. If in doubt, select **Label1**.	Label0 *[Blank]*, Label1 *[Default] to* Label9
	Select whether to use Custom Due Dates when testing. If disabled, the TnP-500 will set the due date using the 'Test Frequency' setting and the current date to calculate the due date.	Enable *or* Disable
	Set the darkness of the printer. Changing this setting from the default setting may impact print quality.	0 [lighter] *to* 30 [darker] *(3 unit increments)*
	Disable the printer from spooling on startup. Spooling makes the printer eject blank tags to calibrate the tag position, though we find this is rarely neccessary.	Yes [Disable] *or* Cancel [Enable]
	Use label check when printing tags.	Enable *or* Disable
Barcode Options	Set the number of digits used when generating a barcode Keep in mind that reducing the number of digits may limit the number of unique barcodes available to you.	2 digits to 7 digits
	Set the starting barcode number Your barcodes will increment from this number	ESC or SET *[Requires keyboard or other input device]*
	Set whether barcodes should use leading zeros. For example, your first barcode with leading zeros would be "000001", and without leading zeros it would be "1"	Enable *or* Disable
	Search all sites on barcode search	Enable *or* Disable
	Show advanced search methods on records	Enable *or* Disable
Set Date / Time	Set the date and time of the internal clock.	DD/MM/YYYY, HH:MM *[Requires keyboard or other input device]*

Wavecom Thermal Transfer Printer

Your TnP-500 comes with an integrated Thermal Transfer Printer - the TT040-50. The TnP-500 printer is ready and fully set up to use out of the box. We can also provide logo artwork for fully customised tags.

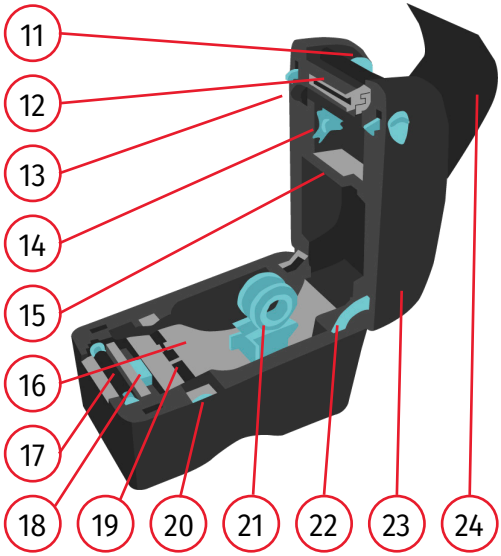


1. LED Indicator
2. Media view window
3. Feed Button
4. Label Exit Chute
5. Top Cover Release Lever



6. SD Card Slot
7. RS-232C Interface
8. USB Interface
9. Power Socket
10. Power Switch

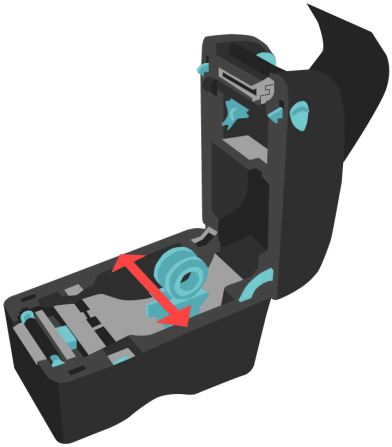
11. Ribbon Rewind Hub
12. Print Head
13. Ribbon Rewind Gear
14. Ribbon Supply Hub
15. Gap Sensor (Receiver)
16. Gap Sensor (Transmitter)
17. Platen Roller
18. Black Mark Sensor
19. Media Guide
20. Media Guide Adjuster Knob
21. Media Holders
22. Top Cover Hinge
23. Top Cover
24. Ribbon Access Cover



Loading Tags

Loading media into the TT-040-50 Printer is quick and easy.

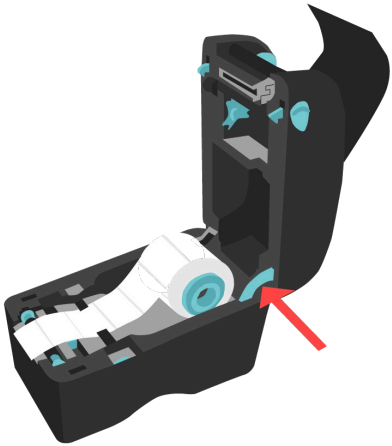
To begin, open the printer top cover by pulling the tabs located on each side towards the front of the printer, and then lift the top cover to the maximum open angle.



1. Separate the Label Holders by gently pulling them in opposite directions

2. Insert the media between the label holders as shown

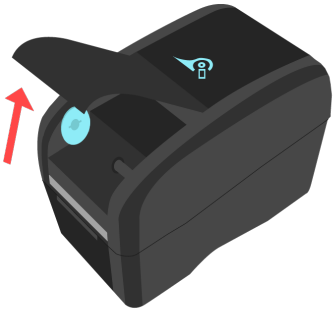
3. Using the Media Guide Adjuster Knob, adjust the Media Guide until it is flush but not tight against the media.



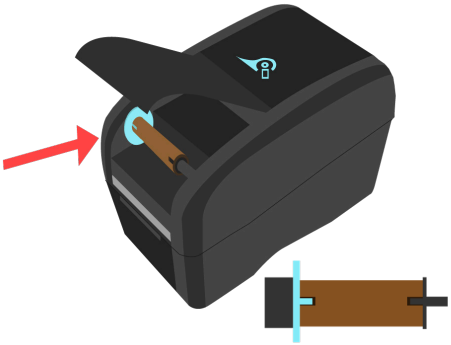
4. To shut the printer, push the support hinge in, then gently shut the printer, ensuring it latches shut. Press the Feed button on the printer before printing, to ensure the tag is printed correctly.

Loading Ribbons

To begin, open the printer top cover by pulling the tabs located on each side towards the front of the printer, and then lift the top cover to the maximum open angle. You will also need to remove the old ribbon (which will be spooled under the top cover shown in step 1) before loading a new ribbon. To remove this ribbon, simply hold the ribbon roll and move it to the right (away from the blue gear).

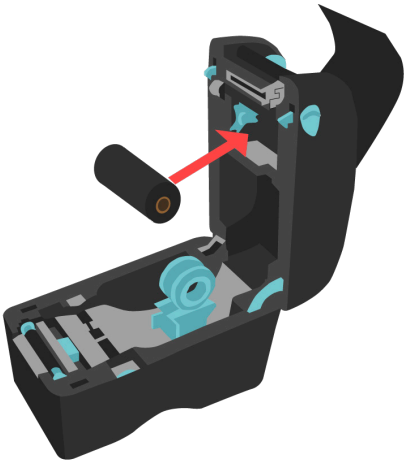


1. Open the top cover of your Printer

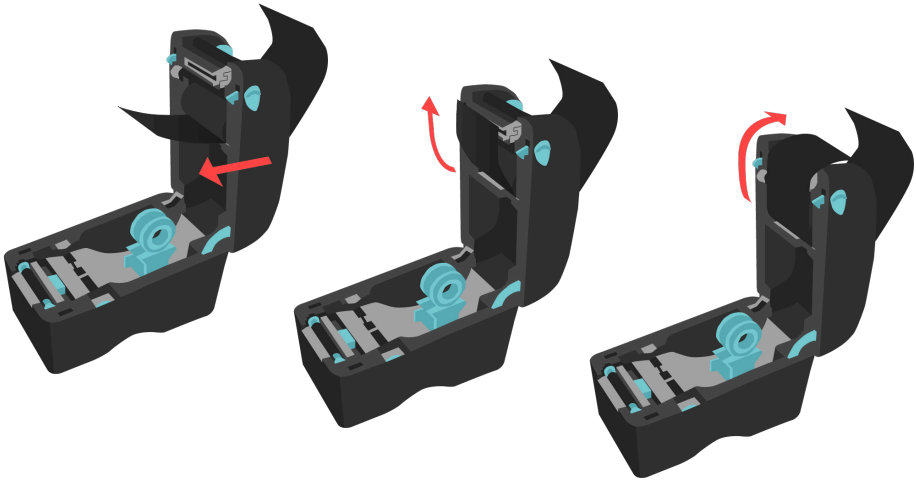


2. Insert an empty core between the gear and the axle - ensure the notches align as shown

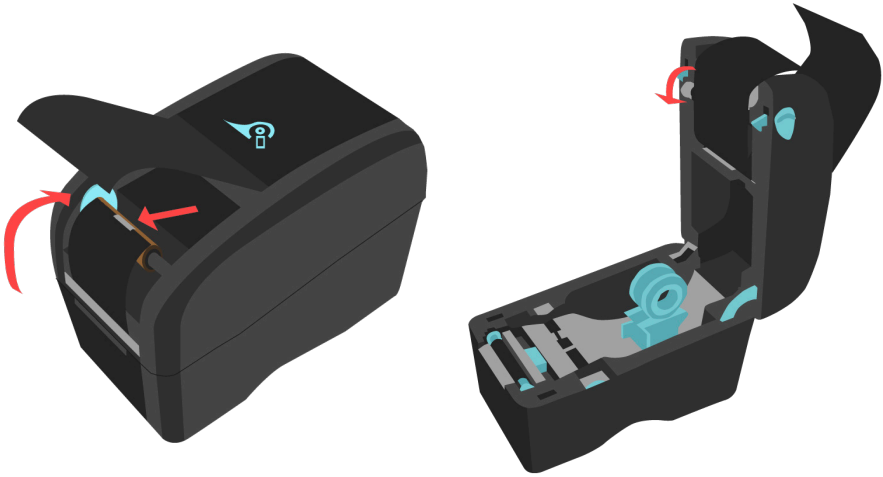
3. Open the printer and get the thermal transfer ribbon ready.
   Ensure the ribbon unwinds from underneath as shown in Step 5



4. Push the ribbon into the right axle (black), then align the notches on the left and insert the ribbon onto the gear (blue)



5. Gently pull the ribbon out, up and over the print head, around to the empty core.



6. Attach the ribbon to the empty roll using a piece of tape - try to attach the ribbon as straight as possible.

7. Use the ribbon rewind gear to tighten the ribbon against the print head, then close the printer.

LED and Button Functions

This printer has one button and one three-colour LED indicator. By indicating the LED with different colour and pressing the button, printer can feed labels, pause the printing job, select and calibrate the media sensor, print printer self-test report, reset printer to defaults (initialization). Please refer to the button operation below for different functions.

LED Colour	Description
Solid Green	This indicates that the power is on and the device is ready to use.
Flashing Green	This indicates that the system is downloading data from PC to memory or the printer is paused.
Amber	This indicates that the system is clearing data from printer.
Solid Red	This illuminates printer head open, cutter error.
Flashing Red	This indicates a printing error, such as head open, paper empty, paper jam or memory error etc.

Regular Button Function

Feed labels

When the printer is ready, press the button to feed one label to the beginning of next label.

Pause the printing job

When the printer is printing, press the button to pause a printing job. When the printer is paused, the LED will be green flashing. Press the button again to continue the printing job.

Default Printer Parameters

Parameter	Default setting	Parameter	Default setting
Speed	76.2 mm/sec (3 ips) (300DPI)	**Tear Mode**	On
Density	8	**Peel off Mode**	Off
Sensor Type	Gap sensor	**Cutter Mode**	Off
Label Dimensions	2” (50.8 mm) x 2” (50.8 mm)	**Serial Port Settings**	9600 bps, none parity, 8 data bits, 1 stop bit
Gap Setting	0.12” (3.0 mm)	**Code Page**	850
Print Direction	0	**Country Code**	001
Reference Point	0,0 (top left corner)	**Clear Flash Memory**	No
Offset	0	**IP Address**	DHCP

Power on Utilities

There are six power-on utilities to set up and test printer hardware. To access these utilities:

1. Turn off the power switch.
2. Hold the Feed button then turn on the power switch.
3. The printer LED will cycle through the following options. Release the button when the LED reaches the relevant utility.

LED Colour (In Order)	Function
Amber Solid	None
Red 5 Flashes	Gap/Black Mark Sensor Calibration **Note: Please select Gap Sensor or Black Mark Sensor type (see below) prior to calibrating the sensor.** Release the Feed button to calibrate the Gap/Blark Mark Sensor. The Gap/Blark Mark Sensor should be calibrated when you first use your printer, when you change your label stock, and if you re-initialise your printer.
Amber 5 Flashes	Gap/Black Mark Sensor Calibration, Self Test and Enter Dump Mode **Note: Please select Gap Sensor or Black Mark Sensor type (see below) prior to calibrating the sensor.** While calibrating the gap/black mark sensor, printer will measure the label length, print the internal configuration (self-test) on label and then enter the dump mode. To calibrate gap or black mark sensor depends on the sensor setting in the last print job. The printer will calibrate the sensor, measure the label length, then print the internal settings. The printer will enter dump mode after printing printer configuration. In the dump mode, all characters will be printed in 2 columns as following. The left side characters are received from your system and right side data are the corresponding hexadecimal value of the characters. To exit Dump Mode, turn off the printer and turn it back on again. Press the FEED button to return to the previous menu.
Green 5 Flashes	Printer Initialisation. Printer initialization is used to clear DRAM and restore printer settings to defaults. Printer initialization is activated by the following procedures. See table below for printer default values.
Green/Amber 5 Flashes	Set Black Mark Sensor as Media Sensor & calibrate the Black Mark Sensor.
Red/Amber 5 Flashes	Set Gap Sensor as Media Sensor & calibrate the Gap Sensor.
Green Solid	Skip AUTO.BAS

Troubleshooting

The following guide lists the most common problems that may be encountered when operating this bar code printer. If the printer still does not function after all suggested solutions have been invoked, please contact the Customer Service Department of your purchased reseller or distributor for assistance.

LED Status / Colour	Printer Status	Possible Cause	Troubleshooting Procedure Procedure
OFF	No response	No power	1. Turn on the power switch. 2. Check if the green LED is lit on power supply. If it is not lit on, power supply is broken. 3. Check both power connections from the power cord to the power supply and from the power supply to the printer power jack if they are connected securely.
Solid Green	ON	The printer is ready to use	No action necessary.
Flashing Green	Pause	The printer is paused	Press the FEED button to resume printing.
Flashing Red	Error	The out of labels or the printer setting is not correct	1. **Out of labels** - Load a roll of label and follow the instructions in loading the media then press the FEED button to resume for printing. 2. **Printer setting is not correct** - Initialise the printer. See previous page for instructions.

Print Problems

Problem	Possible Cause	Troubleshoot Procedure
Not Printing	Check if interface cable is connected to the interface connector.	Reconnect cable to interface.
	The serial port cable pin configuration is not pin to pin connected.	Please replace the cable with pin to pin connected.
	The serial port setting is not consistent between host and printer.	Please reset the serial port setting.
	The port specified in the Windows driver is not correct.	Select the correct printer port in the driver.
	The Ethernet IP, subnet mask, gateway is not configured properly.	Configure the IP, subnet mask and gateway.
No print on the labels	Labels loaded not correctly.	Reload the media, taking care to follow the instructions to ensure the media is loaded correctly.
Continuous feeding labels	Printer settings are incorrect	Initialise the printer to return the printer settings to their default values.
Material Jam	Gap/black mark sensor sensitivity is not set properly	Calibrate the gap/black mark sensor.
	Make sure label size is set properly.	Set label size exactly as installed paper in the labelling software or program.
	Labels may be stuck inside the printer mechanism near the sensor area.	Remove the stuck label
Poor Print Quality	Top cover is not closed properly.	Close the top cover completely and make sure the right side and left side levers are latched properly.
	Wrong power supply is connected	Check if 24V DC output is supplied by the power supply.
	Check if supply is loaded correctly.	Reload the supply.
	Check if dust or adhesives are accumulated on the print head.	Clean the print head.
	Check if print density is set properly.	Adjust the print density and print speed.
	Check print head test pattern if head element is damaged.	Run printer self-test and check the print head test pattern if there is dot missing in the pattern.

Maintenance

This section explains the methods to clean and maintain your printer.

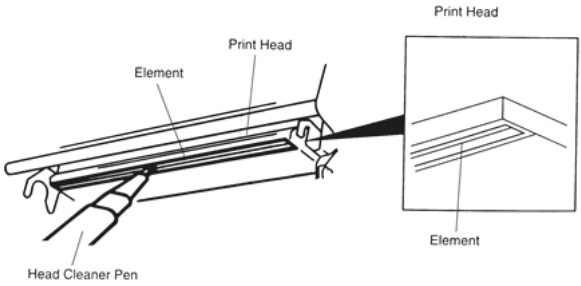
Do not touch printer head by hand. If you touch it accidentally, please use 100% Ethanol to clean it. DO NOT use medical alcohol, which may damage the printer head.

Regularly clean the print head and supply sensors when changing media to keep optimal performance and extend printer life.

You will need the following items to clean the printer.

- Cotton swab (Head cleaner pen)
- Lint-free cloth
- Vacuum / Blower brush
- 100% ethanol

Printer Part	Method	Recommended Maintenance Interval
Print Head	1. Always turn off the printer before cleaning the print head. 2. Allow the print head to cool for a minimum of one minute. 3. Use a cotton swab and 100% ethanol to clean the print head surface.	Clean the print head when changing a new label roll
Platen Roller	1. Turn the power off. 2. Rotate the platen roller and wipe it thoroughly with 100% ethanol and a cotton swab, or lint-free cloth.	Clean the platen roller when changing a new label roll
Tear Bar/Peel Bar	Use the lint-free cloth with 100% ethanol to wipe it.	As needed
Sensor	Compressed air or vacuum	Monthly
Exterior	Wipe it with water-dampened cloth	As needed
Interior	Brush or vacuum	As needed



Wavecom Tags, Ribbons, & Accessories

To support our test and print units we offer to you our range of electrical test tags that are made of the highest grade polypropylene and polyester label materials. These materials are robust and resistant to tearing and will cope with harsh Australian environments. It is recommended in extreme external conditions you use UV resistant tags

Wavecom Printable Tags

The test tags/labels we offer come in the full range of colours, each tag comes with a clear white area where a barcode can be printed onto, ensuring easy and accurate scanning. This ensures that your barcode scanner can read the barcode.

All of the Wavecom tags are suitable for printing using every brand of thermal transfer printers available from around the world. The adhesive used on our tags is most aggressive and comes highly recommended for use in the electrical test and tag industry, there should be no butterflying once applied.

Order Information:

Standard Tags (500 Tags per Roll)	Part no: WCM-TAG-(W, R, BL, G, O, Y, BR) *eg. WCM-TAG-W*
UV Tags (400 Tags per Roll)	Part no: WCM-UV-TAG-(W, R, BL, G, O, Y, BR) *eg. WCM-UV-TAG-W*

Wavecom Printing Ribbon

In support of the Wavecom Tags we offer two grades of ribbons for printing electrical test tags. Our standard ribbon (WCM-Ribbon) is recommended for locations where the printed tag is not exposed to harsh outdoor conditions, such as offices and factories.

Our UV Ribbon (WCM-UV-Ribbon) is recommended for harsher environments like mines or where the equipment is being tested is exposed to the elements. To ensure the durability of print on your tag it is essential that the right ribbon is used on the appropriate label material.

Order information:

Standard Ribbon	Part no: WCM-RIBBON
UV Ribbon	Part no: WCM-UV-RIBBON

Laminated Overlays

In locations where a tag is exposed to harsh chemicals or extreme environments a printed tag may need additional protection to ensure it is readable when the appliance needs to be retested. In these instances, clear film overlays can be applied over the top of an existing tag. These clear laminate overlays are made of strong durable synthetic materials and come with an adhesive backing that ensures that when the overlay is stuck down it stays stuck. This allows you to use your standard Wavecom tags in harsh environments where a standard tag would not normally be suitable.

To use our laminated overlays, the clear laminate is placed over the printed tag before removing it from the backing paper. The combined tag and overlay is then removed from the backing paper and applied to the appliance as normal.

Order information:

Clear Laminated Overlays (1000 per Roll)	**WCM-TAG-ALL-Clear-LAM**

Testing Accessories

1000mm Earth Braid	**WCM-TnT-ES-X**
3-Phase Adaptor (20A 5pin & 32A 5pin)	**WCM-3PH-MADP**
Probe Kit	**WCM-Probe-Kit**
Isolation Transformer for RCD testing	**WCM-ISOT**
IEC-C13 to Figure 8 Adapter	**WCM-8-ADPT**
IEC-C13 to Cloverleaf Adapter	**WCM-CLOVER-ADPT**
AS/NZS 3760 Log Book	WCM-LOG-BOOK
RCD Testing Log Book	**WCM-RCD-LOG-BOOK**
Tag Remover Device	**WCM-KUTTER**

Disclaimer – E&OE

All specifications may be subject to be change by Wavecom Instruments Pty. Ltd. without prior notice.

Updated Specifications & Model changes may be found on the Wavecom website: www.wavecom.com.au

At the time of developing this manual, all care and consideration for accuracy has been implemented. Wavecom accepts no responsibility for any errors or omissions in this document. It is strongly recommended that the Purchaser check Local, State and National Regulatory Standards that may be applicable in your region.

Tester Serial Number

WinPATS Android App
Discount Coupon
(Valid for one use only)

Purchase Information

Date of Purchase

Sold By

The TnP-500 is proudly designed and manufactured in Australia.

Wavecom Instruments Pty. Ltd.

257 Grange Road, Findon,
South Australia, Australia 5023

service@wavecom.com.au

(+61) 08 8243 3500
(+64) 0800 164 888

www.wavecom.com.au

www.winpats.app

SOUTH AUSTRALIA