

Fully Integrated TEST n PRINT UNIT User Manual

TnP-500®	10Amp Model with wired Scanner
TnP-500X®	20Amp Model with wired Scanner
TnP-500W®	10Amp Model with wireless Scanner
TnP-500WX®	20Amp Model with wireless Scanner

TnP-500B®	10Amp Model with wired Scanner & Li Battery
TnP-500BX®	20Amp Model with wired Scanner & Li Battery
TnP-500BW®	10Amp Model with wireless scanner & Li Battery
TnP-500BWX®	20Amp Model with wireless scanner & Li Battery

Australian Designed & Manufactured to comply with testing requirements of
AS/NZS 3760:2010 Standards.



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(Use QR code reader app on iPhone / android phone)

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Important Information

In the box

Integrated Test N Print System	IEC Test Lead (500mm Orange)
User Manual/Quick Start Guide	USB A to USB B Interface Cable
WCM Keyboard	Serial Scanner Cable
Wavecom Scanner	1 x Rolls /500 Labels - 1 x Resin Ribbons
Wavecom TT-040-50	Earth Lead with Alligator Clip (1800mm black)
WinPATS Software (Full Version - Asset Management)	Locking IEC Power Cable (1800mm Blue)
Self-Contained in Heavy Duty Case	(Valid for 12 months from date of purchase)
Manufacturer's 1 st Calibration Certificate	

Important: Please register your WinPATS Software and Test N Print Unit with the provided documentation or online via our website www.wavecom.com.au

Precautions



Unique Locking Power Cable – For whole TnP Range

Please make sure yellow lever is pressed prior to removal of the locking power supply cable - 10A & 20A Models. Failure to do so, combined with excessive force may damage the panel. This revolutionary locking, removable cable is intended not to dislodge during test procedures.
Note: 10A ver. plug illustrated. 20A ver. is similar.

Following are for TnP 500B series with internal lithium-ion battery.

Switch from battery power to mains power

To switch from battery power to mains power, simply plug in the supplied power cord and connect to mains. Unit will automatically switch to mains. Turning off Main Red Neon switch on left top corner will turn off the unit completely.

Switching from mains power to Battery Power or Turning On /Off unit on Battery power

When unit is not connected to mains, simply press and hold ENTER button on the unit till unit starts. Use the same button to turn off the unit. Mains Supply tests, Leakage tests and Meter Mode functions are not available on battery power. To perform RCD Tests, unit is required to be connected to mains power. **[Make sure that battery isolation switch located underneath the keyboard is ON all the time while operating the unit & performing tests.]**

To Charge the battery

Internal lithium-ion battery is of 97.92Wh, 6800mAh. It gets charged automatically while unit is connected to mains. It takes around four hours to charge it fully. While charging, a battery symbol on top right corner of LCD screen will show how much it has been charged and how much is left.

While it's charging and user is not using the unit, display can be turned off by pressing and holding the same ENTER button. This will bring a charging information display and decrease the brightness of LCD screen. Once battery is full charged and it is still connected to mains, battery symbol will convert to plug symbol. It is advised not to put unit to charge when it is unattended or overnight.

Warnings:

Operating Environment: Charging – 0° to ~45°C; Discharging - -20° to ~ 60°C.

Please keep unit away from extreme exposed heat or extreme warm environment where typical temperature is above 60°. Please keep unit safe and secured from free-fall or physical pressures, trauma or drop from heights.

Please do not open Battery compartment which is located behind the printer, unless user suspects that battery is damaged or smoke is detected. Robust design and studies has been carried out while unit was under development and all possible safety concerns are taken care of in this regards. It is still advised not to be opened. Damaged lithium ion batteries are not allowed for transportation. Please speak to support team at Wavecom @ +61 08 8243 3500. Battery can simply be removed by opening a black cover behind the printer, which should only be done in case of damage.

If sending unit for calibration, please turn off the battery isolation switch which is located underneath the keyboard.

Storage Warning: Please store the unit as per operating environment, do not leave unit where temperature can rise above 60° C]

For units with wireless scanner, please note that user have to press and hold yellow trigger button on scanner till it lights up and beeps. Long beep will confirm the connection between unit and scanner. Please let scanner charge for some time once in a while, when unit is connected to mains. Wireless Scanner charges through the dock, please make sure that scanner is docked properly and red LED flashes on scanner, indicating charge mode. Scanner battery and internal main TnP Li battery charges simultaneously while being on Mains power, in case of TnP BW & TnP BWX units.

Manufacturer Recommendations

Calibration: The AS/NZS3760:2010 Standard recommends a routine calibration / verification of this unit to ensure the accuracy of readings on a 12-monthly basis, or as prescribed under any additional local Regulatory requirements.

Note: Only Wavecom Instruments or its Authorised Service Agents are permitted to repair and Calibrate this Instrument. Failure to perform unauthorised service or repair may void all warranties and Calibration Status.

Safety Warning



This 4th Generation TnP series of products have been designed to meet stringent safety requirements, however no device can completely protect persons 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** and suitably trained person, as referred to under the current Standard AS3760:2010, 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 / visual check.
- All user instructions are followed.
- Double check power supply connections. (note LED status)
- 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.

* See P.6 AS/NZ 3760:2010 def.

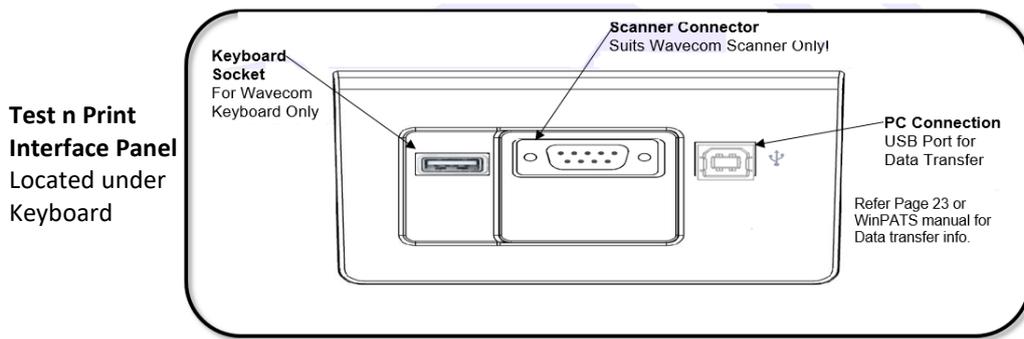
Fully Integrated Test N Print Unit 10A ver. shown

Instrument description

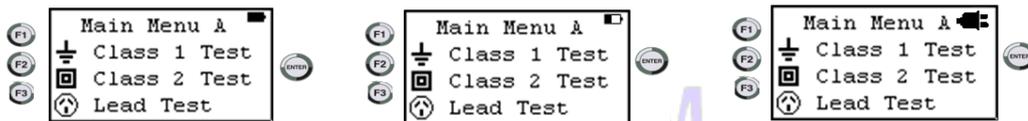
1. Power On/Off Switch
2. Unit Inlet Power Socket
3. IEC Test Socket Appliances Test
4. Function Key F1
5. Function Key F2
6. Function Key F3
7. LCD / Results Display Screen
8. Enter return Key / Menu select
9. Supply Status/Working-Fail Led Indicators
10. Keyboard & Extra Labels Holder
11. Barcode Scanner
12. Wavecom Printer
13. Label Chute
14. Keyboard



Note- 10A ver. shown. 20A ver. Includes Circuit Breaker next to power on/off



Warning: Do not plug any other leads or devices into the L/H USB or R232 sockets! These are proprietary connectors, specifically wired for TnP-500 & X models only.



Battery Symbols on TnP Screen: If unit is powered from battery, a solid battery symbol will show status of charge left. If charging, battery symbol will be interactive and live according the charge status. If unit is fully charged and still connected to mains, battery symbol will change to plug symbol.

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 above definition as described in the current **AS/NZ-3760:2010 Standard** and in addition, to any other local legislation or jurisdictions as may be relevant in your State.

EXAMPLE:

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.

Disclaimer Limited Warranty

The Manufacturer 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 manufacturer of the TnP.

The 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, and DAMAGES FOR PERSONAL INJURY. The Distributors of this product cannot assume liability or responsibility for any loss or damage resulting from the use of this device.

The TnP manufacturer reserves the right to discontinue models, change specification, price or design, at any time without notice or obligation.

Technical Information

Class 1 (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 this test, a continuous earth loop must be made between the exposed conductive material (metal) and the TnP appliance tester. This is done by means of connecting the earth lead with the crocodile clip/probe attached to a GOOD earth point (paint & coatings will not provide effective connections) and the DUT (Device Under Test) plugged into the TnP appliance testers' DUT socket. The Maximum allowable limit is less than 1.0 (ohm).

Refer Page 7 on how to extend time to get a true earth connection (Unique **Earth Bond Test Feature**)

Class 2 (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.

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

The second layer of insulation is termed 'the Supplementary Insulation'. In Class II equipment, protection against electric shock does not rely on basic insulation only, but has additional supplementary 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



For double insulated under Safety Symbols:

Note 1 – Double Insulation is insulation comprising both basic and supplementary insulation.

Note 2 – 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. There is a perceived fear of causing internal damage from over voltage. With the introduction on the TnP Range of appliance testers, these concerns are alleviated.

The TnP Range of electrical portable appliance testers is safe to test electronic equipment as the tests are carried from Active-Neutral (shorted by a relay inside the tester) to Earth. No dangerous voltages pass through in this mode to the internal

components of the DUT (Device Under Test). If these tests are done using an Insulation Tester only and the user tests Active to Neutral, this would be a cause of potential damage, this is why the TnP product range is far safer to use.

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 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 retest. If DUT still fails, check with the DUT Operators Manual or an electrician. [for details see - 'Double Insulation Test' 250/500VDC to change test voltage].

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 test unit.

Leakage Test:

If there are any doubts with insulation testing of the equipment, the standard (AS/NZ3760 since 2001) allows for an alternative test method. A Leakage Test can be performed instead. (The TnP – Series are designed to perform these tests).

NOTE: 10Amps MAXIMUM Resistive Load only (Standard TnP Series units).

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.

Earth Continuity Test, commonly called **EARTH BOND TEST:**

Note: Part of normal (Class 1 test) procedure

Use supplied IEC–Croc clip lead or optional accessory 'WCM-Probe kit'.

The TnP.500 unit conducts earth continuity tests at Approx. 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 3760:2010).

Unique Earth Bond Test Feature

Note: Test time with the new TnP-500 series can now be user controlled. This function enables testing personnel to extend the **Earth Bond** test time by 30 second increments!

This is achieved by momentarily pushing the ENTER  button once, during the test.

The TnP-500 will then add 30 seconds to the test time for ENTER button 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.

Benefit to test personnel is to save time by not having to continually repeat tests in a less than perfect situation.

3 Phase Testing: *Optional equipment required

3 Phase appliances can be tested by the TnP series 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 the optional adaptor 'WCM-3PH-MADP' [See 'Optional Accessories' for details.]

Note: The TnP500 series will not perform a 3 Phase Leakage test.

Contact Wavecom Instruments Pty Ltd for information on appropriate testers.

Switching between 250V & 500V Test

To change the test voltages, when in Main Menu A; Press Enter and F2 together to enter in settings. Select "Change Insulation Vol" and press enter. Select either 250V or 500V.

Please note, TnP starts default to 500VDC, and will revert back to that when restarted.

Integrated Tests

Supply Mains Test **[Not available in Battery Mode of TnP Series]**

The Supply Mains Test checks the polarity and connectivity of the mains supply by LED's. This test is also a part of all the testing functions of this unit.

	<p>If the N-E (red) light is on and you need to conduct load/leakage tests DO NOT CONTINUE. If you are carrying out standard Insulation and Earth Bond tests, it is generally safe to continue. This light will glow if a voltage difference lies between the neutral and the earth, or if no earth is connected to the TnP- Series supply. (If working with a generator or inverter, this is most likely to occur and you may need to consult an electrician before proceeding).</p>
	<p>If both the A-E & A-N (green) lights are on but not the N-E (red), mains supply test is ok, continue to test. ALL GOOD !!</p>
	<p>If both of the N-E (red) & A-E (green) lights are on, consult an Electrician, as there is a fault with the Mains Supply.</p>

Note: While in Battery mode, all LEDs will be off as no mains connected and supply mains test is not carried out.

NCNT Test

(No Connection No Test)

The TnP – Series appliance testers ensure that the appliance is plugged in and switched on. This test is also a part of all of the testing functions of this unit.

This test function ensures that the appliance is plugged into the TnP appliance tester and that it is switched on. If the device is not plugged in and the TnP appliance tester detects that no device is present, plug in to continue the test or confirm 'QUIT' to return to the main menu.

If for some reason the NCNT circuit does not detect the device but it is actually plugged in and turned on, the operator will need to override the NCNT function.

To do this Over Ride **Press F3** (Done with User Discretion)

With an emphasis in the **Standard AS/NZ3760:2010** for carrying out the live testing the TnP - Series appliance testers will indicate for you to check if the device is plugged in and switched on. If the device is not plugged in and/or recognised, it may require a live test therefore making it necessary for the operator to carry out a full functional Leakage Test (Available on all models of TnP – Series).

This function is to ensure that correct testing procedures are carried out in accordance with the Standard AS/NZ3760:2010.

*Optional

Note: When using 3-Phase adaptors the **NCNT** function will need to be over ridden by pressing the 'OK' key prior to the TnP appliance tester performing the assigned test. Some single-Phase appliances controlled by contactors will also require manual over ride. In some instances, holding the 'ON' button will enable the NCNT function to work normally.

Visual Inspection (First Test)

VISUAL INSPECTION HAS TO BE DONE BEFORE ANY OTHER TEST IS CARRIED OUT USING ANY OF THE RANGE OF TnP APPLIANCE TESTERS

- 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 / Over load 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 and systems are in good working order. (i.e. overload latches & buttons).
- No dust &/or dirt obstructs any exhausts or ventilation outlets.
- All controls are working properly and are secure and aligned.

Important: If result is a FAIL!!

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. It is recommended by the manufacturer and distributor of this product that it **SHOULD NOT BE RETURNED TO SERVICE.** To do so would be considered unsafe.



The Wavecom series of appliance testers have been designed & manufactured to exceed and comply with the AS/NZ:3760 standard, and to aid the end user with simple everyday electrical symbols that they can identify with which will allow them to start the testing regime quickly and efficiently, without any complexity as illustrated below.

Operating TnP 500

Follow the simple flow chart as per the requirements.

TnP 500

CAUTION Unplug all leads except power cord when you turn on the unit as unit has automatic system check feature that automatically runs every time on unit start-up. Make sure all peripherals, such as keyboard, scanner and printer are connected before turning on.

Turn on from mains power - Connect Blue power cord and use Power On/Off switch - refer diagram on p.5

Following is for TnP series.

[Turn on/Off from internal Battery - Press & hold Enter button on tester till screen lights up / or till unit shuts down. Unit will operate from internal 97.92Wh 6800mAh lithium ion battery and can perform range of safety tests. Meter Mode®, Leakage tests and RCD test can only be performed while connected to mains due to obvious reasons.

Switch from Battery to mains - Simply connect to mains and turn on power on-off switch on tester, unit will operate from mains and will charge the internal battery and wireless scanner battery automatically. Turning off Power On/Off switch while connected to mains power, will turn off the unit and stop charging internal battery.

From mains power to battery - When user disconnects power from mains, unit will get switched off. Turn unit on from battery by pressing and holding enter button on tester.

While performing RCD tests, unit will stay on battery power while RCD trips to disconnect mains power and let user print the tag or perform the next test, simply reset the RCD which will restore the power back to unit; unit will then swiftly move to mains power from battery automatically without shut-down, and let user re-perform RCD Test.]

Test & Tag Mode / Memory Mode

Tester starts in this mode by default

Use Keyboard, Scanner to Add user, enter site details and perform tests, save results in onboard memory, edit/ delete previous records, print / reprint tags and more.

search barcode by scanning / using keyboard; or create new barcode, enter sites / user / location / equipment details [Page 12]. Once done, keep pressing enter button to take tester to Main Test Menu A. Toggle between Menu A and Menu B by pressing enter key.

CAUTION Press and hold of Enter Button at New/Search Barcode screen will turn off the unit if unit is operating from internal battery-TnP series.

Tester Mode

Press and hold F3 while turning on the unit. This will take unit straight to Main Menu A.

CAUTION Keyboard, scanner & printer are unavailable in this mode. Quick tests performed in Tester mode will not be saved to memory. No details for equipment / site/location etc will be required / recorded.

Perform quick tests - No tag-printing

Main Menu A / B

Use enter button to switch between Menu A and Menu B.

While in Main Menu A, use F1, F2 & F3 to perform Class 1 test, Class 2 Test and Lead test;

While in Menu B, Use F1, F2 & F3 to perform Power test, leakage test & RCD test.

When in Test and Tag (TnT) / Memory mode, after performing test, Tag will be printed automatically and results will be saved.

When in Tester mode, only quick tests can be performed through tester buttons. Keyboard / scanner/ printer can't be used.

To use Meter Mode®, Press and Hold F3 while in Menu A.

Meter Mode® Displays electrical parameters from a power outlet source or from the appliance under test. To exit back to menu A, press and hold Enter as displayed on screen.

Typical use of Meter Mode® can include checking ratings & parameters of appliance and compare them with labelled ratings of appliance.

To go to options / settings Menu, Press Enter and F2 together while in Menu A

To change Insulation Voltage, Leakage test time, Audio options, Data results screen display hold time, labels options, Barcode options, Battery operation time-out settings.

CAUTION 'Press and hold Enter Button' will turn off the unit if unit is operating from internal battery – TnP series

Powering on the Tester

Please above flow chart to power on the unit.

When the tester is powered on, the scanner will beep a few times indicating the scanner is also powered. If no beep is heard check the PS2 connections from the tester, in case of wired scanner. When wireless scanner is provided, keep pressing yellow button on wireless scanner till it starts and makes beeping noise that indicates it is connected to the unit.

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.

Note 1: If the TnP stays locked on the logo screen please check the connectivity of keyboard & scanner cables. The TnP unit will not work with scanner only connected. The TnP system requires either Keyboard only, or both Keyboard & Scanner to be connected.

Note 2: If no devices are connected to the interface, the unit will function as a normal TnT tester.

The TnP units have Memory. There is an inbuilt flash memory and a real-time clock. This gives the ability to store up to 5,000 records, which can include items from 16 different sites and 6 different users. This will help to increase the efficiency and pace of testing. The TnP units (with memory) have two operating modes:

- TnP tester mode only, no peripherals (Keyboard, Scanner or Printer) connected
- Test and Tag / TnT mode, all devices connected & on, allowing testing, scanning, retrieval & printing

The TnT mode is determined if a keyboard is connected. If there is no keypad / scanner detected, then the TnP will start in tester mode by default, taking to Main Menu A. If the keypad & scanner are present, then the new barcode screen will be loaded, in TnT mode.

CAUTION: All peripherals are supposed to be connected when unit is turned on. If keyboard / scanner were not plugged in when unit turned on in TnT mode, tester will not connect to keyboard / scanner as " Active / Hot connection". Please connect all peripherals, and turn off the unit. Restart the unit, once all connected.

Test n Tag Mode / Memory Mode

TnP500 starts in memory mode by default. Keyboard, scanner and printer are all integrated in this mode to aid user to create / save equipment & sites with relevant details into on board memory. Test results are saved and tags are printed at the end of test. Tags can also be reprinted from memory.

The test sequence starts with option of creating a barcode or searching a barcode from the memory. A site and user has to be added before testing can be done.

Adding New Equipment

The following must be done before testing:

- Create a site or use an existing site.
- Create a user name to under the users list.
- If auto generate number is used the initial number must be set correctly.
- If you are adding equipment to an existing site please make sure that the correct site is displayed. If the wrong site is displayed the equipment will be assigned to the wrong site.

When the testers memory has been erased it will look like the following screen.

Screen	Instruction
<pre><F1 SELECT SITE New Barcode 0000000 5000</pre>	<p>When the initial screen in memory mode operation is displayed. A site and user must be entered before testing can be done. When using the TnT for the first time, < F1 Select Site will be flashing in the top region of the screen.</p>

Adding a Site

Screen	Instruction
<pre><F1 SELECT SITE New Barcode 0000000 5000</pre>	<p>From the initial screen, press F1. Don't hold the F key, this will select a different function.</p>
<pre>SITES 1 - 3</pre>	<p>The TnT can hold up to 16 sites. To scroll through the sites, press enter. 3 sites will be shown on each screen. Each site corresponds to an "F" key, for example Site 1 = F1. To edit a site, hold the corresponding "F" key for 2 seconds. If the Site has a * symbol next to the name then the site name cannot be altered. This site was uploaded from WinPATS and needs to remain the same.</p>
<pre>Edit Site 1</pre>	<p>Using the keypad, enter the name of the site. The Keypad operates in 3 modes- Alpha, Numeric and Predictive. When an editable screen is entered, there will be an ALP, NUM or PRE in the top right hand corner of the screen. If you are using a full size half size keyboard then the 3 modes don't apply. Leave the text on ALP mode. Once the details have been typed in press enter to return.</p> <p>Note: Predictive mode will only work if a dictionary has been uploaded from WinPATS MX. Once a site has been entered, press enter.</p>
<pre>SITES 1 - 3 WAVECOM</pre>	<p>Once a site has been entered, the 'F' buttons are used to select the site. For example to select site 1, F1 would be pressed.</p>
<pre>WAVECOM New Barcode 0000000 5000</pre>	<p>Once a site has been selected, the TnT will return to the initial screen and the site that was selected will be shown in the top left hand corner of the screen.</p>

Adding a User

Screen	Instruction
<pre>WAVECOM New Barcode 0000000 5000</pre>	<p>From the initial screen, press F2. Don't hold the F key, this will select a different function.</p>
<pre>USERS 1 - 3</pre>	<p>The TnT can hold up to 6 users. To scroll through the users, press enter. 3 sites will be shown on each screen. Each site corresponds to an "F" key, for example User 1 = F1. To edit a user, hold the corresponding "F" key for 2 seconds.</p>
<pre>Edit User 1 GEORGE</pre>	<p>Entering a user is the same process as entering a site, please refer to the Adding a Site steps above, Note: The user name will not appear on the initial screen once selected.</p>

<pre> USERS 1 - 3 GEORGE </pre>	<p>Once a user has been entered, the 'F' buttons are used to select the user. For example, to select user 1, F1 would be pressed.</p>
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Auto Generate Barcode Function

If required, the auto generate barcode number can be set before testing. The auto generate is always displayed in the bottom left hand corner of the new barcode screen.

Screen	Instruction
<pre> WAVECOM New Barcode 0000000 5000 </pre>	<p>The TnT 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, 1002, 1003 etc. This can be accessed by holding F3 for 2 seconds on the Barcode Entry screen.</p>
<pre> BARCODE LENGTH: Up 7 DIGITS Down ESC SET </pre>	<p>Once the auto generate menu has been accessed, the user 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.</p>
<pre> SET BARCODE: 1000 ESC SET </pre>	<p>If enter was pressed, the user can now set the barcode that will begin the sequence. Key in a barcode and press enter to continue, or F3 to return the Barcode Entry screen.</p>
<pre> USE LEADING ZEROS Enable Disable </pre>	<p>If enter was pressed, the user can specify whether or not to use leading zeros in the auto generated barcode. For example: If the user selected 7 digits in the barcode and entered 1000 as the barcode, the barcode will be 0001000 if leading zeros are enabled. 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.</p>
<pre> WAVECOM New Barcode 0001000 5000 </pre>	<p>The current barcode that will be generated is displayed in the bottom left hand corner of the Barcode Entry screen.</p>

Entering Items

Screen	Instruction
<pre> WAVECOM New Barcode 0000000 5000 </pre>	<p>Type in the new barcode or press F3 quickly to choose the auto generate number. Once a barcode has been specified, items can be entered. If the screen displays "search barcode" press enter to switch to new barcode. There must be no numbers entered in to switch between the two modes.</p>

<p>Loc Desc Make</p>	<p>A selection of details can be entered for an item. Details include; location, description, make, model, serial number, asset number, frequency of test and notes. Each heading relates to an 'F'; e.g. Loc = F1, Desc = F2 and Make = F3. Only 3 items are displayed at one time. To scroll through the various details, press enter key. By continually pressing enter you can loop back to the first 3 items. Please make sure location and description are filled out and check to see that the frequency is correct. Once the details are entered, hold the enter key for 2 seconds to move on to the visual check screen.</p>
<p>Loc Desc Make OFFICE LEAD HPM</p>	
<p>ALPHA MODE</p>	<p>Entering an items details is the same process as entering sites and users, please refer to the Adding a Site/User steps above. Ensure that test frequency for the item is set in accordance with the AS/NZ 3760 Standard</p>
<p>VISUAL CHECK 30/03/2015 17:46 OTHER STATUS FAIL PASS</p>	<p>After the item, has been visually inspected, there is 1 of 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 TnT will revert back to the barcode entry screen. If you have a zebra printer a tag will be printed. If the test is a visual check only then press (enter hold). See below for details.</p>
<p>Main Menu A Earthed Test D/Insulated Test Ext Lead Test</p>	<p>If the item passes a visual inspection and pass is selected, testing can begin. Select the correct test based on the appliance type. TnP Testing Menus, Main Menu A and Main Menu B are explained in later sections at page 16.</p>
<p>EARTH BOND TEST Pass < 1.0 Ohms 0.0 Ohms Pass 1s</p>	<p>Once test has been completed the results are displayed.</p>
<p>INSULATION TEST 500VDC 1 MOhms 3s</p>	
<p>WHAT NEXT? RE-TEST CONT</p>	<p>To test the item again, press (F3). This will take you back to the main menu A screen. From here you can choose a test class. You would use this for example if testing power boards. To complete the test, press enter. This will take you back to the new barcode screen. If you have a zebra printer, a barcode will be printed once (enter) is pressed.</p>
<p>Visual Check Only Option</p>	
<p>VISUAL CHECK 30/03/2015 17:46 OTHER STATUS FAIL PASS</p>	<p>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.</p>
<p>VISUAL CHECK ONLY? SAVE AND EXIT YES NO</p>	<p>Pressing (enter) will take you back to the visual check screen. Pressing (F3) will complete the test. Print out a tag if you have a zebra printer. Then go back to the new barcode screen.</p>

Retesting Equipment

The following must be done before retesting:

- A site must exist in the tester with records. A site is usually uploaded from WinPATS.
- The correct site must be displayed on the first line of the new / search barcode screen. If the incorrect site is displayed no equipment will be reported when scanned. To change see the add sites section.

The correct user must be selected from the users list. A user is important because it give a reference to the test results in WinPATS. It is also the user that is displayed on the tag. If there is no users create a users as described in the add equipment section or upload the users list from WinPATS.

Screen	Instruction
<pre> WAVECOM Search Barcode 0000001 4999 </pre>	Type in or scan the barcode number to be searched and press enter. If the screen displays new barcode press enter to switch over. The screen can only be switched if there is no entry.
<pre> Loc Desc Make OFFICE LEAD HPM </pre>	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.
<pre> VISUAL CHECK 30/03/2015 17:49 OTHER STATUS FAIL PASS </pre>	After all item details have been entered, hold the enter key for 2 seconds to proceed to the Visual Check screen. After the item has been visually inspected, there is 1 of 3 options that can be selected; Out of Service (F2), Fail (F3) and Pass (enter). If Out of Services or Fail is selected the result will be saved and the TnT will revert back to the barcode entry screen. If you have a zebra printer a tag will be printed. If the test is a visual check only then press (enter hold). See add equipment for details.
<pre> Main Menu A Earthed Test D/Insulated Test Ext Lead Test </pre>	If the item passes a visual inspection and pass is selected, testing can begin.
<pre> EARTH BOND TEST Pass < 1.0 Ohms 0.0 Ohms Pass 1s INSULATION TEST 500VDC 1 MOhms 3s </pre>	Once test has completed the results are displayed.
<pre> WHAT NEXT? RE-TEST CONT </pre>	To test the item multiple times press (F3) this will take you back to the main menu A screen. From here you can choose a test class. You would use this for example if testing power boards. To complete the test press (enter). This will take you back to the search barcode screen. If you have a zebra printer a barcode will be printed once (enter) is pressed.

To download records using WinPATS software, please refer to the Downloading Records section of the WinPATS manual

Deleting Equipment

If for some reason a record needs to be deleted it can be removed from the search barcode screen. This feature removes the whole record and not just the test results. If a record is deleted and replaced it might create a new record when downloaded in WinPATS. This is because the record details didn't match the original ones. Multiple items cannot be deleted at the same time. **It is recommended to use Winpats for deleting equipment, as it is very easier that way. In TnP series, records can be deleted through WinPATS software only. Deleting records through TnP is not recommended.**

<pre> WAVECOM Search Barcode 0000002 4995 </pre>	<p>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.</p>
<pre> WAVECOM S/Records Del. 0000001 4999 </pre>	<p>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.</p>
<pre> Delete Record? 0000000 Hold F3 to Del. DELETE QUIT </pre>	<p>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.</p>

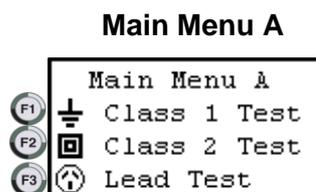
Reprint Tag without testing

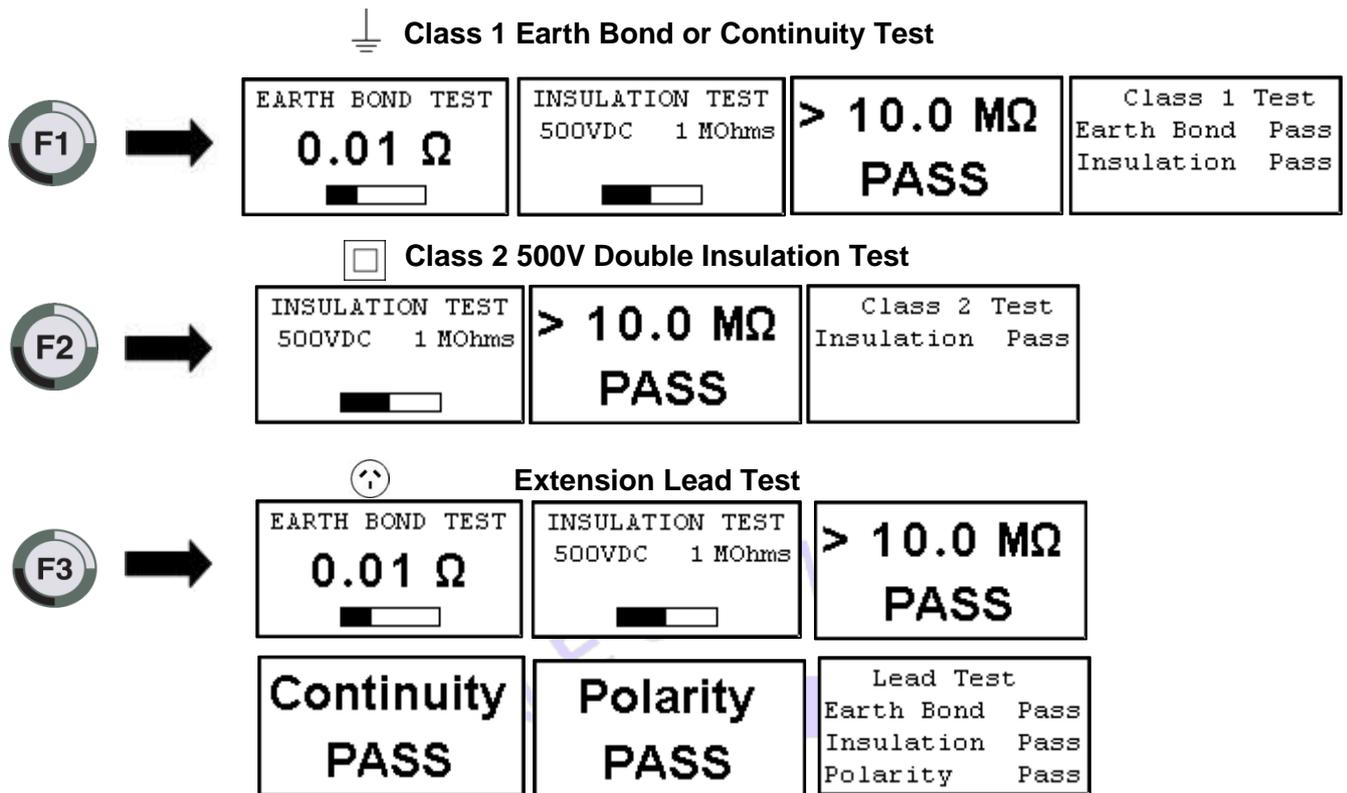
<pre> WAVECOM Search Barcode 0000002 4995 </pre>	<p>From the search barcode screen, enter barcode to search (From settings, advanced search options can be enabled). Select the record. Press and hold Enter till screen with Loc Desc Make, press Enter, Model SN Asset, Press Enter one more time to bring Freq Notes Tests;</p>
<pre> Freq Notes Tests 1 Years 1 Tests </pre>	<p>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</p>
<pre> Review Tests Re-print Label 24/04/2015 PASS </pre>	<p>Press re-print the label. Use Esc key to get back to previous menu when printing is done</p>

TnP Testing Menu – Main Menu A & Main Menu B

Use enter button to switch between Menu A and Menu B.

Test Menu A – Function Flow Chart





Class 1 - Earthed Appliance Test – Menu A - F1

Please Note: A **Visual Inspection** test must be carried out before any others (refer to First Test Section)

The Class 1- Earth Appliance Test completes the following sequences as part of its procedure:	
1. Integrated Supply Mains Test	Refer to Integrated Test section
2. Integrated NCNT Test	Refer to Integrated Test section
3. Earth Bond Test (@ 200mA): 200mA test current, pass level less than 1Ω	
4. Insulation Test (@ 250V or 500V): pass level greater than 1MΩ	

Please Note: 250V insulation testing applies to Class 1 appliances if selected (refer to *Technical Information* for details to change test voltage)

In some situations, if the DUT is labelled with “Surge Protection Fitted” or if it contains **MOV’s** (Metal Oxide Varistors), conduct a 250V-insulation test.

*If unsure refer to the **AS3760 Standard**. Should it still fail, remove it from service. (Refer to the *Technical Information* section to change test voltage).

Procedure:

1. Complete a Visual Inspection. **Only proceed if test passed.**
2. Plug device into appliance socket.
3. Connect earth clip to any exposed metal on the device.
4. Press the F1 key and wait for results (ensure that device is powered on)
5. Read and record results appropriately
6. Unplug device
7. Tester will return to Main menu A automatically

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 the DUT with a **DANGER** tag and remove the device from service.

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

Class 2 Test - Double Insulation Test – Menu A - F2



Please Note: A Visual Inspection test must be carried out before any others (refer to First Test Section)

The Double Insulation Test completes the following test sequences as part of its procedure	
1. Integrated Supply Mains Test	Refer to Integrated Test section
2. Integrated NCNT Test	Refer to Integrated Test section
3. Double Insulation Test (@250V or 500V): pass level greater than 1MΩ	

Procedure:

1. Complete a Visual Inspection (**Note: Only proceed if test passed**)
2. Plug the appliance into appliance test socket.
3. Connect earth clip to any exposed metal on the device (if any, or device can be wrapped in foil or use metal mesh braid, Part No: WCM-ES 500)
4. Press the F2 key and wait for results (ensure the device is powered on)
5. Read and record results appropriately
6. Unplug device
7. Tester will return to Main Menu A automatically

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.

In some situations, if the device is labelled with “Surge Protection Fitted” or if it contains **MOV’s** (Metal Oxide Varistors), conduct a 250V-insulation test. (**Hint always read the compliance plates during Visual Mainly on surge protected powerboards**)

*If unsure always refer to the **AS3760:2010 Standard**.

Should it still fail, remove it from service. (Refer to the *Technical Information* section to change test voltage).

Lead Test (Ext Lead Test) – Menu A - F3

Please Note: A Visual Inspection test must be carried out before any others (refer to *First Test* Section)

The Lead TEST completes the following sequence as part of its comprehensive testing procedure:	
1. Integrated Supply Mains Test	Refer to <i>Integrated Test</i> section
2. Earth Bond Test (@ 200mA): 200mA test current, pass level less than 1Ω	
3. Insulation Test (@ 250V or 500V): pass level greater than 1MΩ	
4. Continuity and Polarity Test 240VAC @ 2mA Checks continuity & polarity of leads	

Procedure:

1. Complete a Visual Inspection. **Only proceed if test passed.**
2. Plug in supplied orange IEC adaptor lead supplied into front IEC socket.
3. Plug male end of extension lead or power board in to TnP appliance socket.
4. Press the F3 key and wait for results.
5. Read and record results appropriately.
6. Unplug extension lead/power board.
7. Tester will return to Main Menu A automatically.

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

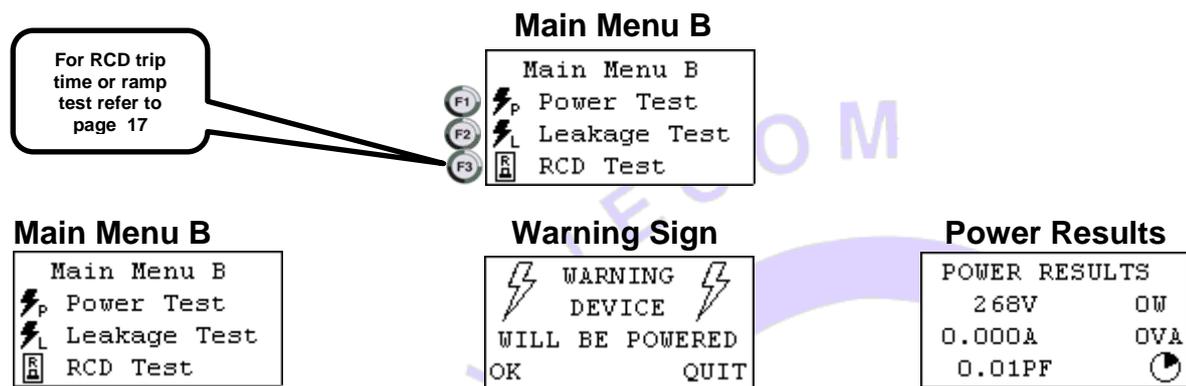
If the result was a fail - Tag with a **DANGER** tag and remove the device from service.

Please Note: 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.

Test Menu B – Function Flow Chart

Use enter button to switch between Menu A and Menu B. Menu B tests cannot be performed without mains power.

Power Test - Menu B – F1



The **Power Test** is for the purposes of monitoring and performance of equipment. The power test feature is for single phase appliances only.

Please Note: A **Visual Inspection** test must be carried out before any others (refer to *First Test* Section)

The Power TEST completes the following sequence as part of its comprehensive testing procedure:	
1. Integrated Supply Mains Test	Refer to <i>Integrated Test</i> section
2. Power Test	

Procedure:

1. Complete a Visual Inspection. For details refer to the *First Test* section. If the unit passed the Visual Inspection, continue with the following instructions. If not, refer to the *First Test* section.
2. Plug male end of appliance into 3PLM – Single Phase Series Appliance socket.
3. Press F1 to start the power test.
4. If the appliance is safe to test press F3 on safety warning message. 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.
7. Press Enter to return to the main menu.

This test is ideal for service agents and electricians. The user can plug in the appliance and turn it on with real time measurements displayed on the display. This is useful when testing an appliance with a compliance/name plate on it. The operator can compare the name plate details of operating voltage, operating current, and power factor etc. should the appliance exceed the said values on the name plate it could be deemed faulty and require service.

Please note: Because the **power test** is not required in the electrical testing standards there is no pass / fail value in the TnT+M. It is up to the user to determine if the item is a pass or a fail based on the compliance/name plate.

If the result was a pass - Tag with the appropriate tag including "next test due" date and "return to service".

If the result was a fail - Tag with a **DANGER TAG** and remove the unit from service. The **Power Test** allows the user to turn the appliance on and measure its performance as a digital wattmeter. Displayed parameters are:

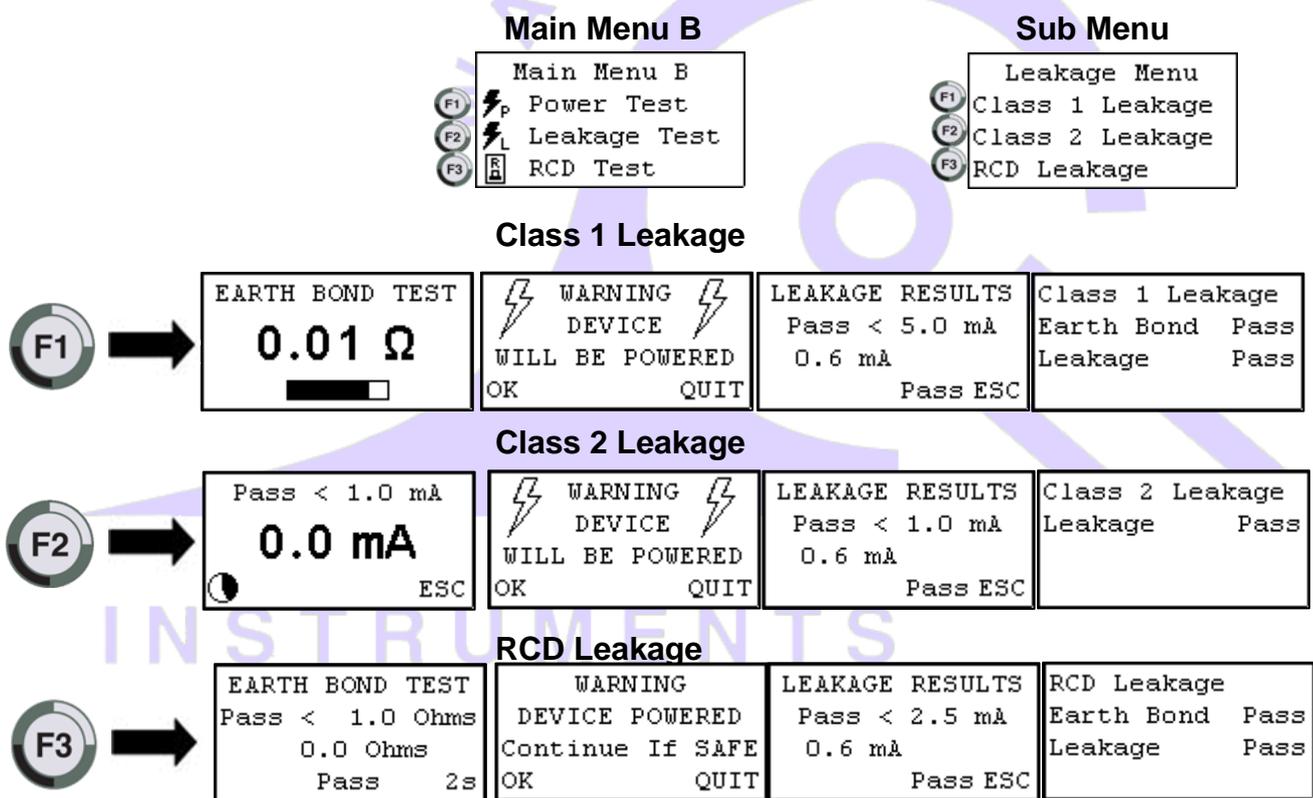
- Volts AC
- Current
- Volt Amp
- Power Factor
- Watts

Caution: Before operating ensure the equipment is firmly secured to eliminate the possibility of causing injury or damage. This function turns powers the Unit on, please make sure the drills or any blades of any rotating devices have been removed prior to any testing and have clearance from body or object. Appliances may jump off benches and may need to be secured by clamping them, or they may cause serious damage if not secured properly.



Leakage / Run Test – Menu B – F2 [Not available in Battery Mode of TnPB Series]

The Leakage Test is an alternate method to perform insulation resistance tests. Leakage testing is a major function of the TnP series.



Please Note: A Visual Inspection test must be carried out before any others (refer to First Test Section)

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 since 2001) allows for a **leakage test** to be carried out **instead**. The TNP- Series appliance testers have been designed to perform these tests. 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 i.e. Class 1 = > 5mA as Fail.

The Limit of imbalance measured on the TnT-+ M, appliance tester 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.

Procedure:

1. Complete a **Visual Inspection**. For details refer to the *First Test* section. If the device passed the Visual Inspection, continue with the following instructions, if not, refer to the *First Test* section.
2. Press the return key to view Main menu B.
3. Press a function key (as follows) to start the test/s. Press F1, F2 or F3 depending on the type of device you are testing). **F1** = Earth Leakage, limit set to MAX then 5mA fail. **F2** = D/insulated leakage and ext. leads, limit set to MAX then 5mA fail. **F3** = RCD leakage.

CONFIRM IF SAFE TO CONTINUE? OK/QUIT. IF OK, DEVICE WILL POWER SWITCH ON. ENSURE ITEM AND ENVIRONMENT FOR SAFE OPERATION!

4. Results are displayed, read and record appropriately.
5. Unplug DUT.
6. Press Enter until you return to the main menu.

If the result was a pass - Tag with the appropriate tag including "next test due" date and "return to service".

If the result was a fail - Tag with a **DANGER TAG** and remove from service.

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 - Series appliance testers. These limits are set according to the **AS/NZ3760**. Should these values change in future it can be simply altered in firmware. A Pass / Fail will also be displayed at the end of the test.

The run time period can be adjusted (by 5sec increments). The value can be changed by selecting the leakage test time in the options menu. See the **special functions** section of the manual for more details. The factory default setting is 20sec. The value for the leakage runtime is also used for the power test (plus models only).

Caution: Before operating ensure the equipment is firmly secured to eliminate the possibility of causing injury or damage. This function will power the Unit on, please make sure the drills or any blades of any rotating devices have been removed prior to any testing and have clearance from body or object. Appliances may jump off benches and may need to be secured by clamping them, or they may cause serious damage if not secured properly.



The leakage test time is adjustable. These can be done by turning on the TnP in settings mode / Tester mode. Turn the unit on while pressing F3. This is explained in later section.

RCD Test – Time Test / Ramp Test– Menu B – F3

Please Note: when any RCD testing is to be carried out on any circuit that is protected by an RCD in the main switchboard (upstream), it's most likely to trip this upstream RCD. When performing RCD trip time or Ramp current tests on any (portable) RCD devices, the **RCD in the switchboard may trip faster**. This is due to increased upstream levels of **leakage current** from the **additional circuits** and devices connected to it. The fixed RCD's can also have better connectivity, sensitivity and mechanical mechanisms.

To avoid tripping large areas in the work place monitored by the switchboard RCD it is suggested that an RCD (**Isolation Transformer**) be used. These are designed specifically for the purposes of field RCD tripping.

DO NOT use these Transformers for any other purpose. Ratings 240VAC in 240VAC Out @ 30VA Fuse protected Primary winding 500mA

To perform RCD tests the TnP supply lead needs to be plugged in to the RCD device to be trip tested. For tripping switchboard mounted (Fixed) RCDs Plug TnP into GPO marked RCD protected or if known to be protected circuit. (Diagram 2) (**Isolation Transformer Required**) If testing portable RCD devices on power boards or extension leads plug TnP into power board or lead (**Isolation Transformer Required**) [**Not required if using TnP Battery series with 4.3 advanced motherboards**]

TnP500, TnP500W, TnP500X & TnP500WX – all are required to be connected as per below. Use adapter cable that is provided with X units 20A for 500X and 500WX units.

Diagram 1 For Testing Portable RCD



Diagram 2 For Testing Fixed RCD -All models



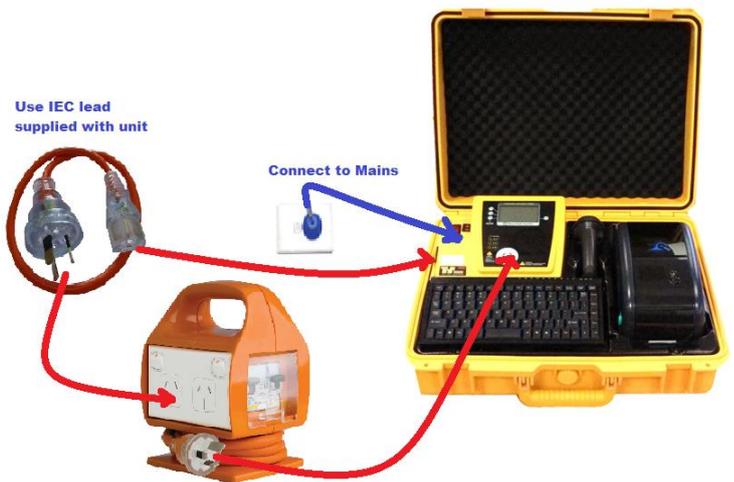
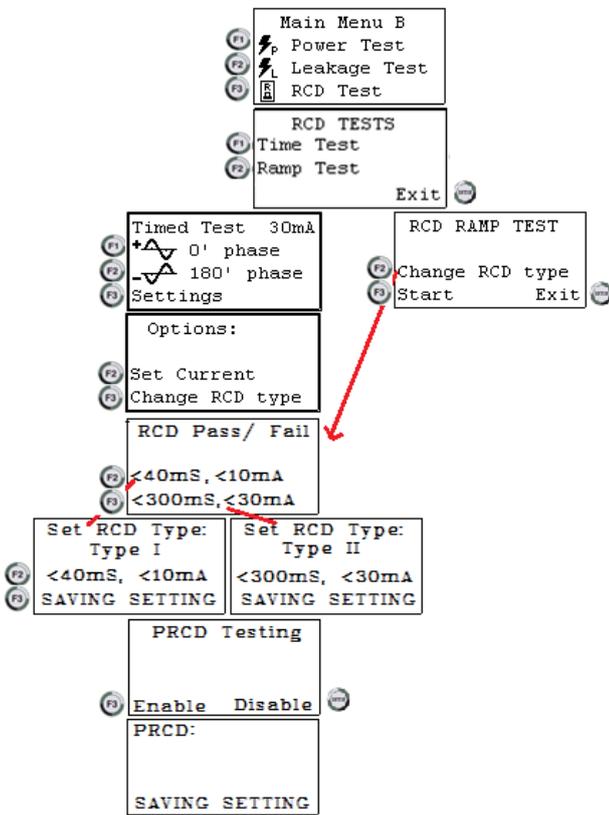
For testing Portable RCD in TnP series – with 4.3 Motherboard and Internal Lithium-ion Battery [Separate Isolation Transformer – not required]

Note* Portable RCD must have hard re-set button (unlike RCDs like in Diagram1 above where re-set button only works when RCD is powered. In such cases, please connect TnP series as per diagram 1)

Connect Portable RCD – with hard re-set switch- as per diagram 3.

Enable Portable RCD from Main Menu B > F3 / RCD Tests > F1 /Time Test > F3 /Settings > F3 / Change RCD Type > select F2 or F3 > Select F3 to enable PRCD or Enter to disable PRCD.

Enable Portable RCD from Main Menu B > F3 / RCD Tests > F2 / Ramp Tests >> F2 / Change RCD Type > select F2 or F3 > Select sf3

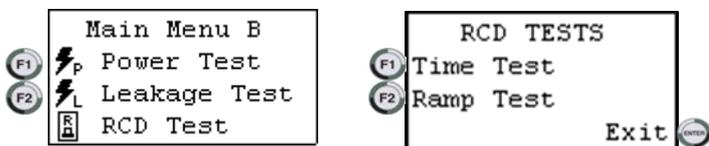


to enable PRCD or Enter to disable PRCD.

For testing Fixed / Wall/ Board RCD in TnP series; Power the unit from RCD board / GPO, connect as per diagram 2 in previous page. Disable PRCD function as per the flowchart above, to test fixed RCD / wall / Board RCD.

Diagram 3 PRCD setup for TnP series

➤ To do RCD test, select F3 in Menu B, press Return/Enter button.



To enter the RCD menu from Main Menu B, press and release the F3 button.

Press F1 to select the time test.

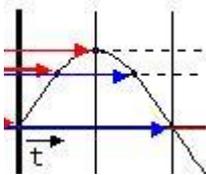
Trip Time Testing: This principal is designed to trip RCD devices at a fixed current and to determine the trip time of the RCD device.

This function is factory set to 30mA for fast testing the user can set the current to X0.5, X1.0, X 5 using the RCD Multiplier.

I.E. (30mA X 0.5 =15mA)
 (30mA X 1.0 = 30mA (this also is effective on any set test current of the RCD tester from 5mA to max) 500mA output.)
 30mA X 5.0 = 150mA These tests should result in no-trip, trip & fast trip times respectively.

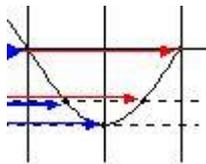
F1 - 0 degree

This is the positive half of the mains supply cycle. (50HZ Aust/NZ). Press F1 – The preset mA test current will then be used in the following test and begin the trip test from the positive half of the sine wave.



F2 - 180 degree

This is the negative half of the mains cycle, (50HZ Aus/NZ). Press F2 - The preset mA test will then be used in the following test and begin the trip test in the negative half of the sine wave.



```

Timed Test 30mA
+▲ 0' phase
-▲ 180' phase
Settings
    
```

Performing a Time Test:

The displayed trip time is in milliseconds. This is the time taken for the RCD device to trip once the injected fault current has been applied. The TnP RCD injects a true fault current value using a real-time compensation calculation of the actual voltage at the time of test hence delivering a true and accurate trip current.

RCD Test Options:

F3 – Change to select tested: 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. See the next section for explanation. From the options menu, press F2 to change the current level and F3 to change the RCD type.

```

Options:
Set Current
Change RCD type
    
```

Adjusting the current level:

The TnP 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 and release F2 from the options section to display test current.



Up - This button 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



Down - This button 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.



Set - This button sets the selected current for the next trip time test. The TnP RCD will then return to the current trip time test screen.

Changing RCD Type:

Depending on the RCD, the RCD type needs to be selected from the options menu. These options change the pass / fail values when performing RCD tests. Please make sure that you have the correct RCD type selected. The RCD types are:

Type I: Has a trip time of < 40mS and a trip current of < 10mA. These types of RCD's are mainly used on sites containing medical equipment. These types of RCD's must be compliant with AS3551. (please refer to this AS3551 standard if unsure)

Type II: Has a trip time of < 300mS and a trip current of < 30mA. Unless specified on the RCD device nearly all RCD will be this type. This is the default setting on all new units.



Selects type I and saves to memory



Selects type II and saves to memory

RCD Timed Test (continued):

Press the F1 key to select the 0-degree test and the F2 key to select the 180-degree test.

Use the F1/F2 keys to scroll through the multipliers X0.5 X1.0 X5.0 of the set current.

Maximum output current = 500mA. I.E if set test current were 100mA then 100 X 5.0 =500mA.

If set test current = 200mA then maximum output 5 x 200mA =1A is out of range. Unit will not deliver this output current and display on Screen "OUT of RANGE".

Press F3 to start test. TnP will display results for 5 seconds after mains supply is tripped. If the power is not reset by the time the unit loses power, then the result will be displayed on power on.



Caution: Pressing F3 at this point will cause tripping if RCD fitted to circuit

RAMP CURRENT TEST. This testing principal 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 has a nominal leakage current of 2mA, which should be added to the result of test. E.g. if RCD tripped at 22mA + 2mA(TnT RCD)=24mA trip current.

RCD RAMP TEST	
Change RCD type	
Start	Exit

RCD Trip Current. Press F2 to show the Trip current screen.

Caution: Pressing F3 at the RCD ramp test screen will cause tripping if RCD fitted to circuit. F2 can be pressed to change the RCD type at this point. See "Changing the RCD type" for details.

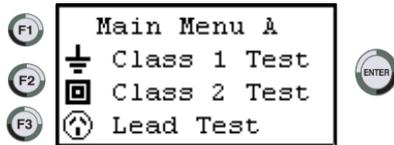
The Trip Current Test will ramp the mA current up until the RCD breaker trips. Current range 2.55 - 500mA. This test can go for up to 10 sec to scroll through full range if RCD faulty or not fitted. Repeated testing in this mode will cause heating of TnP. Should over heating occur the internal temperature sensor will cause display to indicate "over temp allow to cool" This requires the TnP device to be best left unplugged for several minutes allowing unit to cool.

[All TnP Models except TnPb series] TnP will display results for 5 seconds after mains supply is tripped, using small internal 300mAh battery. If the power is not reset by the time unit loses power, then the result will be displayed when power is back on. Once power is back on by resetting the RCD, option to continue (Enter) or re-test (F3) will come on the tester. Pressing enter / continue, Tag will be printed.

In TnP 500 Battery series, even after RCD trips, tester runs from battery and lets user print the Tag. In case of Portable RCD, mains power stays on and user can perform any number of PRCD as User desires. For testing main boards / fixed / wall RCD, once RCD trips off and cuts power to the unit, user can still print the tag and do other required things on battery backup. To re-test the RCD, user have to re-set the RCD to provide mains power back to unit.

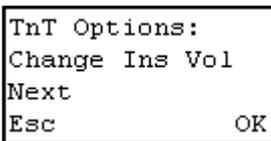
Options Menu / Settings

Main Menu A

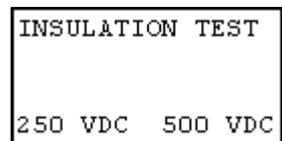


Hold enter  and press F2  to get into settings – options Menu. Options will start from Change Ins. Voltage. Press next / F2  to go to next settings option, or ESC/  to exit from TnT Menu. Press enter  to get in to that specific settings and perform changes.

Change Insulation Voltage



Press OK, and screen will show options for 250VDC or 500VDC. Select the required voltage by pressing F3 or enter button.



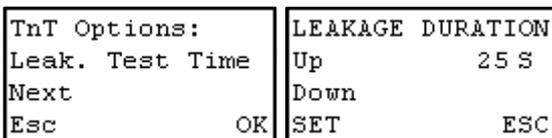
Some DUT contain MOV's (metal oxide varistor) or commonly known as spike protection devices. These limit the mains voltage to about 280VAC. If you attempt to perform a 500VDC insulation test on one of these devices you will get a failed result. To fix this problem select the 250V option.

- Press the  key to select the 250V option.
- Press the  key to select 500V option.

You can also set the unit back to 500V by switching the mains power off and on again. The default insulation voltage is 500V.

Change Leakage Test Time

The **leakage test** time is adjustable. You may need to adjust timing in this feature if the DUT has a long power up time or requires special power on procedure. Default time for **Leakage Test** is 20 seconds. From this menu you can change the test time from 5 seconds to 28800 seconds. Adjusting to any less than 5 seconds will put the test time to infinite.



- Press the  key to increase the test time.
- Press the  key to decrease the time.
- Press the  key to set the new leakage / power test time.
- Press the  key to escape out of the menu. No changes saved.

Change Audio Settings

Enabling the audio option will make the TnP use a sound to indicate a pass or a fail at the end of a test. If the TnP unit has never been altered, then the audio beep is disabled.

```
TnP Options:
Audio Option
Next
Esc          OK
```

- Press the  key to disable.
- Press the  key to enable.

Change Result hold time

Press Enter and F2 to enable options then F2 until you get to result hold time this allows you to change the time that the results values are showed on the TnP display screen

```
TnP Options:      RESULTS DELAY
Result Hold time  TIME: 3 Seconds
Next              DECREASE
Esc              INCREASE      OK
```

- Press the  key to increase time.
- Press the  key to decrease time

Note Carefully: This setting will change the default display times and will remain until user re-sets to another preferred value.

The feature enables the user to change the displayed time of the **Test Result** from approx. 1 – 90 seconds.

To enable Result Hold time option, from Main menu A, hold ENTER key and press **F2** key. Release ENTER key. Further pressing **F2** key four times cycles you to the Result Hold setting screen. Pressing ENTER key (OK) will display the settings page. Select your preferred timing by pressing **F2** or **F3** buttons (Increase or Decrease) as observed on the LCD screen. Once the required result is shown on the LCD screen, press the ENTER key to lock new Result Hold time. The TnP-500 will return to Main menu A.

Please note: as a further convenience, if Result Hold time during **normal testing** needs to be reduced, simply press the ENTER key to rapidly move to the next test sequence. Alternative, is to re-set the Result Hold setting again, as above.

Change Battery Time-out settings – Only in TnP series

Press Enter and F2 to enable options then F2 until you get to Battery T/set. Press enter / OK to change the battery time out settings. This is the time for which unit will stay on while under battery operation if not used for that long time. This is to save the battery power when unit is idle. User can set the battery time-out settings up to 60 Minutes from 1 minute.

```
TnP Options:      SET BATTERY ON
Battery T/Set     TIME: 10 Minutes
Next              DECREASE
Esc              INCREASE      OK
```

Change Label Options settings

Changing the label options changes the way the printer behaves or how the tag is printed. When selecting this option you will be prompted with 3 different options. Enable / Disable, choosing a label set and modify the due date.

Enable / Disable

Selecting this option will **enable** or **disable** the tag information being sent to the zebra printer. The printer can also be disabled by switching the printer off from the power switch located on the side of the printer. Once the printer is switched back on it will not print out the records that were created while the printer was switched off.

- Press the  key to disable.
- Press the  key to enable.

Choose Label Set:

If you have more than one logo in the printer's memory (multiple company logos) this function will allow you to select the various logos. If you have one logo stored in the printer then you only need to choose Label 1. If you choose anything else a blank tag will be created. If you have multiple logos then the next one to choose would be label1 and so on. If you are unsure which one to choose select the Label 0.

- Read the onscreen message and then press the  key.
- Press the  key to increase the label number.
- Press the  key to decrease the label number.
- Press the  key to select the displayed label number.

Customise Next Test Due Dates

Enabling this feature will allow **customise next test due** dates when testing equipment. When this feature is disabled (default setting) the **next test due** date is determined by the test date plus the frequency of test. When enabled a custom date can be set after visual test in TnP models.

- Press the  key to enable.
- Press the  key to disable.

Stop Labels Spooling On Power On

If the printer is spooling tags on power on then it has reverted back to the factory default settings. To stop this choose the F3 key when prompted. The printer must be switched on and have a solid green light. If not, the printer won't receive the command.

- Press the  key to enable.
- Press the  key to disable.

Change Barcode Options settings

Barcode options refers to modifying the auto generate barcode function. The **barcode options** can be selected in two ways. Either holding F3 down when on the new barcode screen or by the TnP options menu. Both have the same menu options expect when entering **barcode options** VIA TnP options. These menu options are:

- Set the number of digit for barcodes.
- Set the auto generate barcode number
- Use leading zeros for the auto generate number.
- Search all sites on barcode search (only available from TnP options menu).

Search All Sites Allows the TnP to **search all sites** listed in the site names section for the given barcode. If this option has not been altered, then by default **search all site** is disabled. When disabled the TnP can only search for barcodes that are in the site selected (Indicated by the site name in new barcode / search barcode screen).

Search all sites is useful disabled and enabled. For example, you may have many items with the same barcode number in different sites. Disabling this feature allow you isolate a particular barcode with ease. If you have a barcode but you are unsure which site it is in, then you should enable **search all sites**.

Be careful when **search all sites** is enabled. If a barcode is found in another site, the site name will change when you return the new barcode screen.

Set Date / Time

Kill Switch



To stop operation, press the **return/enter** key at **any time**. The unit will power down after 20 seconds as factory default



Caution: This test turns the Equipment ON. The power / leakage test can handle up to **10 Amp** (Resistive) Load MAX. **Exceeding** this value will blow the external M205 ceramic fuse. Care should be taken when testing inductive loads (i.e. AC motors) with large start up currents.

If 10A HBC fuse is blown the appliance will **not operate** in Leakage test modes. Replace fuse only with M20 10A HBC fuses. Any other fuse voids warranty and manufacturers design.

Caution: DO NOT OPEN TnP - Series case as there are no serviceable parts inside and you can void your Warranty

Other Features

Barcode Printing Function - Only on Selected Memory Models This utility will print out barcode labels from what is typed on the screen. The idea is to save time by storing these barcodes in a book or collection. From here you can quickly scan a barcode without having to retype the text back into the TnP unit. To access this feature:

- Hold the  key from the new barcode / search barcode screen.

You will be required to select your printer model. The Wavecom printer has a different print orientation to the Wavecom model. Selecting the wrong printer model will make the tag print incorrectly.

- Press the  key if you have a Wavecom or plus model printer.
- Press the  key if you have a Wavecom model printer.

Type the text you want for your barcode. If you go past the end of the screen the text will wrap. A maximum of 32 characters can be entered.

- Press the  key to print the barcode.
- Press the  key to return back to the new barcode screen.

Meter Mode ® [Not available in Battery Mode of TnPB Series]

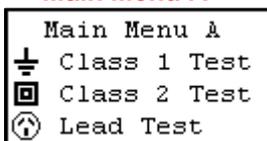
Meter Mode Screen



How to Activate Meter Mode

- Hold **F3** from main screen display for 2 seconds

Main Menu A

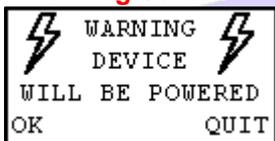


Volts Screen

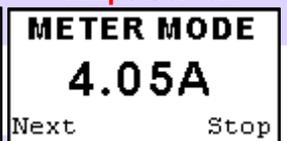


- Screen will change to show volts by default when socket is (not powered)
- Plug appliance into testers , test socket , Press F3 to go into power mode and will show
- **(Warning device will be powered)**
- Press F3 again to continue and **(power the device)**. If you continue the A-N LED on the tester will flash green  and device will power up. Otherwise press enter to exit.

Warning Screen



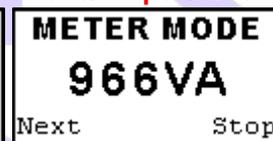
Amps Screen



Watts Screen



Volts/Amps Screen



- Press the enter key to stop the power mode and return to volts.
- Pressing F3 key will start power mode again.
- **TnT stays in Meter Mode** regardless of power on/off until you exit
- Pressing **Return key** will **exit** meter mode and return the main menu.
- If the TnP-500 is reset in meter mode it will return to meter mode when powered up again.

Meter Mode Uses

Meter Mode is a new and versatile function of the new Gen 4 tester that will allow you to display **Electrical Parameters** from a Power outlet source or from the appliance under test.

Typical Applications

Example.: Measuring the Power of a bar heater, or electric power drill check the ratings and compare them to that on the compliance plate etc. Quick test of Power outlet Voltages in rooms or locations split from multiple circuits.

Meter Mode Features – (Four Discrete Options)

Electrical parameters are displayed as Volts, Amps, Watts, and Volt / Amps

These electrical parameters will be displayed on the Testers main screen display. Select from the 4 Test available in Meter Mode.

Meter Mode Measures and displays volts in AC, Current in Amps, Power Measurement in Watts and VA in Volt/AMPS

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

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 times amps (V*A).

***Meter Mode[®] is a unique function of all TnP-500 + Gen 4 Models.**

Uses of Volt-Amp Measurement

- Because it represents the amount of energy computing systems may draw from a power grid, the VA is used to determine the kind of wiring and circuit breakers required to support the computing equipment in question.

Watts and VA (Detailed Explanation)

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

Safety Precautions

Make sure you have a clear and safe area when powering any equipment, remove any drills bits etc before testing any equipment. Always read equipment compliance plates.

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.

SPECIFICATIONS TnP® Series

Mains Supply Test

- ❖ Checks Polarity and continuity of mains supply by LED indicators (A-N, A-E, and N-E). (Flashing red LED indicates test fail)

CLASS 1 Earthed Appliance

- ❖ Appliance Check: Ensures appliance is plugged in and turned on.
- ❖ Earth Bond Test: 200mA test current. Pass level Less than 1.0Ω. Measurement: 0.01Ω to 10Ω.
- ❖ Insulation Test: 500VDC / 250VDC. Pass level Greater than 1MΩ. Measurement: 0.1Ω to 10MΩ. *See also Leakage Test

CLASS 2 Double Insulated Appliance

- ❖ Appliance Check: Ensures appliance is plugged in and turned on.
- ❖ Earth Bond Test: 200mA test current. Pass level Less than 1.0Ω. Measurement: 0.1Ω to 10Ω.
- ❖ Insulation Test: 500VDC / 250VDC. Pass level greater than 1MΩ. Measurement: 0.1Ω to 10MΩ. *See also Leakage Test

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 10Amp load operation.
*TnP-500X model is capable of up to **20 Amp load**

Note 1: Pass level for CLASS 1 is 5 mA; pass level for CLASS 2 is 1 mA

Note 2: Leakage test may be performed if for any reason a standard CLASS 1 or CLASS 2 is not possible.

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 10Amp (20Amp for TnP-500X)
- ❖ 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 10Amp
- ❖ Voltage: 200 to 265VAC
- ❖ Apparent Power: 0 to 2400VA
- ❖ Power: 0 to 2400W

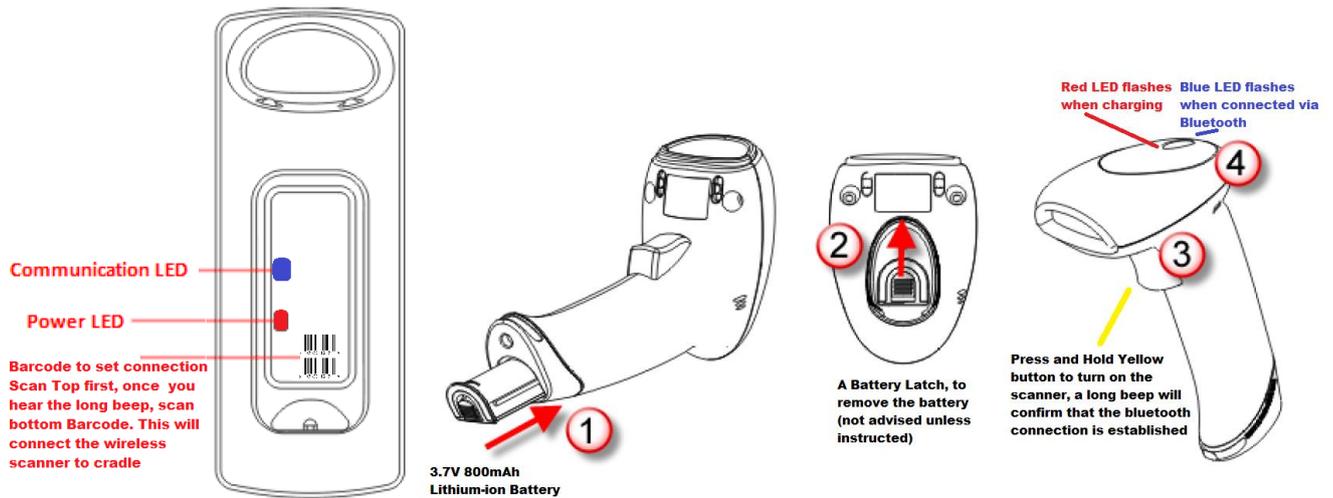
Wireless BARCODE scanners 1560P – for TnPW series

		1500P / 1500WA	1560P	1502	1562	1504B	1504A	1564A	
Category		Linear Imager		Laser		2D Imager			
		Corded	Bluetooth® Class 2 (2.4 GHz) Version 4.0+EDR	Corded	Bluetooth® Class 2 (2.4 GHz) Version 2.1+EDR	Corded		Bluetooth® Class 2 (2.4 GHz) Version 4.0+EDR	
RF Communication of Bluetooth® scanner	Coverage	--	90 m ³ / 295 ft. line of sight	--	90 m ³ / 295 ft. line of sight	--		90 m ³ / 295 ft. line of sight	
	Standard profile	--	SPP, HID	--	SPP, HID	--		SPP, HID	
Performance	Optical sensor	2500 pixels		Laser		1280 x 800 pixels	752 x 480 pixels		
	Light source	Red LED 625 nm	Red LED 618-626 nm	Visible laser diode at 650 ± 15 nm		White LED (2x)	625 ± 5 nm LEDs (2x)		
	Resolution	3 mil		4 mil		3 mil - 1D barcode / 5 mil - 2D barcode			
	Depth of field	Code 39 3 mil	6.9 to 10.7 cm / 2.7 to 4.2 in.		Code 39 4 mil: 1 to 4 cm / 0.4 to 1.6 in.		3.5 to 9.5 cm / 1.4 to 3.7 in.	6.9 to 10.7 cm / 2.7 to 4.2 in.	
		Code 39 5 mil	6 to 17 cm / 2.4 to 6.7 in.		1 to 12 cm / 0.4 to 4.7 in.		3.5 to 14.5 cm / 1.4 to 5.7 in.	3.6 to 18.5 cm / 1.4 to 7.3 in.	
		UPCA 13 mil	4 to 40 cm / 1.6 to 15.7 in.		1.5 to 51.5 cm / 0.6 to 20.3 in.		6 to 34 cm / 2.4 to 13.4 in.	4 to 30.5 cm / 1.6 to 12 in.	
		PDF417 5 mil	--		--		3 to 10.5 cm / 1.2 to 4.1 in.	7.1 to 11.4 cm / 2.8 to 4.5 in.	
		QR Code 10 mil	--		--		2 to 16 cm / 0.8 to 6.3 in.	2.5 to 16.5 cm / 1.0 to 6.5 in.	
	"Long barcode 8.2 cm, 8 mil"	1500P : 10 to 20 cm / 3.9 to 7.9 in 1500WA: 7.5 to 14.5cm / 3 to 5.7 in		--		--	--		
	Scanning angle	Pitch ± 70° Skew ± 70°		Pitch ± 65° Skew ± 50°		Pitch ±60° Skew±60°			
	Minimum PCS	25% (1500WA: 30%)		45%		30%			
	Scan rate	520 scans/ second (1500WA: 100 scans/ second)		100 scans/ second		30 scans/ second	60 scans/ second		
	Ambient illumination	100,000 lux							
	Hands-free scanning	Auto-sense and continuous modes		Continuous mode		Auto-sense and presentation modes			
	Barcodes support	Codabar, Code 39, Code 93, Code 128,GS1 DataBar (RSS), Industrial 2 of 5, Interleave 2 of 5, ISBT-128, Italian and French Pharmacodes,Matrix 2 of 5, MSI, Plessey, Telepen, UPC / EAN / GS1-128, and more				1D: All of the barcodes that 1500 series 1D scanners can support 2D: PDF417, MicroPDF417, DataMatrix, QR code, Micro QR code		1D: All of the barcodes that 1500 series 1D scanners can support except French Pharmacodes, Plessey and Telepen 2D: PDF417, MicroPDF417, Composite, RSS, TLC-39, Datamatrix, QR code, Micro QR code, Aztec, MaxiCode Postal Codes: US PostNet, US Planet, UK Postal, Australian Postal, Japan Postal Dutch Postal (KIX)	
Programmable features	Data editing, interface selection, symbology configuration								
Language support	US and UK English, French, Italian, Belgian, Norwegian/Swedish, Spanish, Portuguese, German, Japanese and Turkish								
Physical	Dimension L x W x H	15.3 x 6.1 x 9.3 cm / 6.0 x 2.4 x 3.7 in.							
	Weight without cable / with battery	1500P: 149 g / 5.2 oz. 1500WA: 145 g / 5.1 oz.	173 g / 6.1 oz.	149 g / 5.2 oz.	177 g / 6.2 oz.	149g / 5.2 oz.	154 g / 5.4 oz.	185 g / 6.5 oz.	
	Color	Black							
	Switch	Tactile Switch							
Electrical	Memory for Bluetooth® scanner reserver buffer / batch mode	--	4 K / 512 K	--	4 K / 512 K	--	--	10 K / 4 MB	
	Working hours for Bluetooth® scanner	--	36 hours based on 1 scan / 5 seconds	--	24 hours based on 1 scan / 5 seconds	--	--	26 hours based on 1 scan / 5 seconds	
	Voltage	+5 V ±10% / 3.7 V 800 mAh Li-ion battery							
	Power consumption ² Standby / Operating	1500P: 20 mA / 286 mA 1500WA: 50 mA / 265 mA	20 mA / 250 mA	35 mA / 210 mA	25 mA / 210 mA	50 mA/ 280 mA	22mA / 150 mA	22mA / 166 mA	
User Environment	Temperature	Operating: 0°C to 50°C / 32°F to 122°F Storage: -20°C to 60°C / -4°F to 140°F							
	Humidity	Operating: 10% to 90% Storage: 5% to 95%							
	Impact resistance	1.5 m (4.9 ft) multiple drops onto concrete	1.2 m (3.9 ft) multiple drops onto concrete						
	Ingress protection	IP30							
	Electrostatic discharge	±8 kV contact ±15 kV air							
	Regulatory Compliance	BSMI, CE, RCM, FCC, IC	BSMI, CE, RCM, FCC, IC, NCC, SRMC, JRL	BSMI, CE, RCM, FCC, IC, KC	BSMI, CE, RCM, FCC, IC, KC, NCC, SRMC, JRL	BSMI, CE, RCM, FCC, IC, KC		BSMI, CE, RCM, FCC, IC, KC, NCC, SRMC, JRL	
Configuration	RoHS, REACH, WEEE, ErP Setup options include Windows®-based ScanMaster software, by direct connection or printing out barcode settings								

1560/62 BT **DOES NOT** require any initial programming and can be used immediately, these configuration instructions are for reference purposes.

The A4 sheets of command and control bar codes that accompany these instructions should be studied and will be required during the batch data download operations, we recommend that copies are made and laminated to provide greater durability, the originals filed for reference. The Bar-Key.exe command charts can to be folded and laminated as A5.

Scanner Charging & Communication Dock



Capable of charging 1560/62, the built-in stand is specifically designed for the scanner to communicate with a host tester wirelessly, the connection between the scanner and the stand is made easy and reliable. The stand is also an Auto-Sense stand when used with the 1560 scanner set to Auto-Sense mode.

Two LED indicators are provided on cradle base for communications status and power status.

Power LED		Meaning
Red, solid	---	Power ON
---	---	Power OFF
Communication LED		Meaning
---	Blue, solid	Initialize
Red, solid	---	Failed to establish a USB connection
Red, solid	Blue, flashing	Serial command mode with USB Virtual COM or RS-232: wait 3 seconds for starting a serial command
Red, flashing	Blue, flashing	Serial command mode with USB HID: wait 3 seconds for pressing [Num Lock] or [Caps Lock] 5 times via keyboard
---	Blue, flashing	Wait for connection request from the scanner (Slow flash at 0.5 Hz)

A multicolour LED (Red / Blue / Green) is provided on scanner head.

(LED On Scanner Head)		
Status LED		Meaning
Red, solid	---	Charger power ON (LED on for 0.5 second)
Red, solid	---	Charging battery
---	Green, solid	Charging done
Red, solid	Green, solid	Pre-charging when battery voltage under 3V (Typical)
---	---	Power or battery not ready

Scanner LED			Meaning
Red, flashing	---	---	<ul style="list-style-type: none"> ▶ Charging (On/Off ratio 0.5 s: 0.5 s) ▶ Configuration Mode (On/Off ratio 0.5 s: 0.5 s)
Red, solid	---	---	Charging error
Red, flashing	---	---	Flashing red (On/Off ratio 0.3 s: 2.5 s) indicates the scanner is inactive and its CPU running at low speed to save power — <ul style="list-style-type: none"> ▶ No WPAN connection is established after waiting for two minutes
Red, on-off	---	---	<ul style="list-style-type: none"> ▶ Power on, with one long beep (high tone, LED on for 1 second) ▶ Data saved to buffer when transmit buffer is enabled and the scanner is out of range, with two short beeps (high-low tone) ▶ Transmit buffer full, with one long beep (low tone) ▶ Transmit buffer disabled, with one long beep (low tone) ▶ Memory full in memory mode, with two short beeps (high-low tone)
---	---	Green, on-off	Good Read, with one short beep (high tone) and beeper pitch and duration programmable
---	Blue, flashing	---	First, flashing blue (On/Off ratio 0.5 s: 0.5 s) for two minutes indicates the scanner is waiting for connection, and goes off if no connection is established, then flashing red (On/Off ratio 0.3 s: 2.5 s) indicates the scanner is inactive. It is ready for connection only while the LED is flashing blue — <ul style="list-style-type: none"> ▶ SPP Slave: waiting host to connect ▶ HID or SPP Master: trying to connect to host ▶ Using 3656: trying to connect to 3656
---	Blue, flashing	---	Flashing blue (On/Off ratio 0.1 s: 0.1 s) indicates the scanner receives a PIN code request from host (flashing more quickly than waiting connection).
---	Blue, flashing	---	Flashing blue (On/Off ratio 0.02 s: 3 s) indicates the scanner has established a WPAN connection successfully.
---	Blue, flashing	Green, flashing	Flashing blue and green (On/Off ratio 0.1 s: 0.1 s) indicates an error occurs while entering the PIN code. Press the trigger to get ready for re-connecting.

The scanner has a buzzer to provide user feedback in various operating conditions.

Beeping	Meaning
One long beep, high tone	Power on, with red LED on (1 second) and off quickly
One short beep, high tone	Good Read, with green LED on-off quickly
<ul style="list-style-type: none"> ▶ Programmable, default to 4 KHZ 	
Six short beeps <ul style="list-style-type: none"> ▶ High-low tone repeats three times 	<ul style="list-style-type: none"> ▶ Enter Configuration Mode, with red LED flashing ▶ Exit Configuration Mode
Two short beeps, low-high tone	Setup barcode read successfully
One short beep, high tone	<ul style="list-style-type: none"> ▶ More setup barcode required ▶ Input PIN code ▶ Clear PIN code
One short beep, low tone	More barcodes required to complete the "output sequence" requirements of Multi-Barcode Editor, with green LED on-off quickly (Upon completion, same as Good Read.)
One long beep, low tone	<ul style="list-style-type: none"> ▶ Transmit buffer full, with red LED on-off quickly ▶ Transmit buffer disabled, with red LED on-off quickly ▶ Configuration error (Wrong barcode...) ▶ PIN code input error ▶ Reject random PIN request ▶ Fail to send data in memory mode
Two short beeps, high-low tone	<ul style="list-style-type: none"> ▶ Data saved to buffer when transmit buffer is enabled and the scanner is out of range, with red LED on-off quickly ▶ Memory Mode – Memory full, with red LED on-off quickly
Two short beeps, high tone	Low Battery Alarm
Two long beeps, high-low tone	Multi-Barcode Mode – Buffer full
Three short beeps, tone ascending from low to high	<ul style="list-style-type: none"> ▶ WPAN connection established, with blue LED flashing ▶ WPAN connection resumed, with blue LED flashing
Three short beeps, tone ascending from high to low	WPAN connection out of range or suspended

Notes:

- ✓ The battery may not be full charged for shipment and will require a complete charge before first use. Make sure the scanner is correctly installed on the dock; connect the tester to mains power and scanner battery will start charging automatically.
- ✓ The scanner LED will be flashing RED while charging and will turn OFF when the charging process is complete. If a charging error occurs the scanner LED will stay solid RED.
- ✓ It takes approximately 3 hours for the battery to become fully charged.
- ✓ Battery charging stops when the temperature drops below 0° C or exceeds 40°C. It is recommended to charge the battery at room temperature (18°C to 25°C) for optimal performance.
- ✓ When the scanner battery is fully charged remove the scanner from the stand and hold down the trigger for approximately 2-3 seconds to turn the scanner ON. The scanner will respond with a long beep and its LED will turn ON and OFF shortly.
- ✓ To turn OFF the scanner in an emergency, remove the battery. Scanner will turn off automatically if idle for 10 minutes.
- ✓ When the battery charge becomes low the scanner will be unable to emit the scan beam and its power-on-beep will sound different to normal.
- ✓ Pairing: - In some cases where the 1560/62 BT has been programmatically reconfigured it may be necessary to re-pair (bind) the 1560/62 BT unit with the communication stand.
Pairing (sometimes refereed to binding) is the process of respectively scanning both the “Set Connection” bar code and the “Serial No” bar code located on the communication stand using the associated 1560/62 scanner unit. A rapidly flashing blue light on the communication stand will indicate successful pairing.

The barcode reader is now ready to use, simply open the application that you require to capture the bar code data and start scanning. For windows users, an ideal application to test the scanner is “Notepad”, a small editor program located among Windows accessories.

Once paired, 1560/62 scanner will automatically try to establish a connection with the communication stand, each time its powered on.

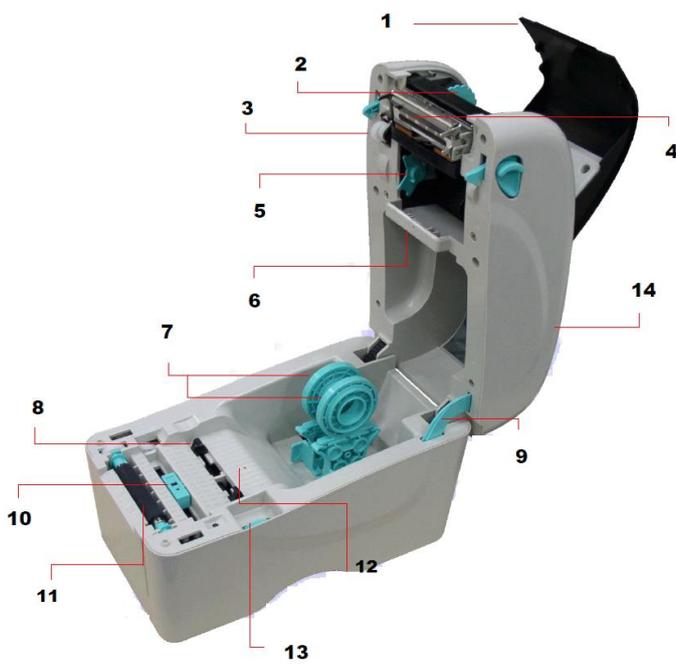
Please refer CipherLab user guide for advanced settings and setup barcodes 1560/1562 Barcode scanners. This is available at our website and can be requested through after-sales support.

Wavecom Thermal Transfer Printer



When TT040-50 is purchased as part of a Wavecom Test n Print Unit, the Printer is ready and fully set up to use. Owner’s Barcode Label Artwork may be installed as an option.

Please note that images in this section are for illustration purposes only. Actual Model of Printer in TnP may vary.



- 1. Ribbon access cover
- 2. Ribbon rewind hub
- 3. Ribbon rewind gear
- 4. Print head
- 5. Ribbon supply hub
- 6. Gap sensor (receiver)
- 7. Media holders
- 8. Media guide
- 9. Top cover support
- 10. Black mark sensor
- 11. Platen roller
- 12. Gap sensor (transmitter)
- 13. Media guide adjuster knob
- 14. Top cover

Rear Side of the Printer

- 1. Power switch
- 2. Power jack socket
- 3. USB interface
- 4. USB host (Factory option)
- 5. RS-232C interface / Ethernet interface (Option)
- 6. SD card socket (Not Applicable to this unit)

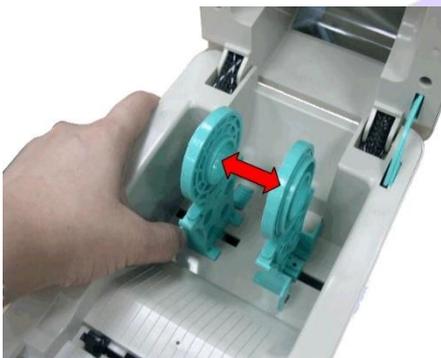


Loading the media

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. →



← Separate the media holders to the label roll width.



Place the roll between the holders and close them onto the core. Place the paper, printing side face up, through the media guides & media sensor. Place the label leading towards the edge onto roller. →



← Move the media guides to fit the label width by turning the media guide adjuster knob.



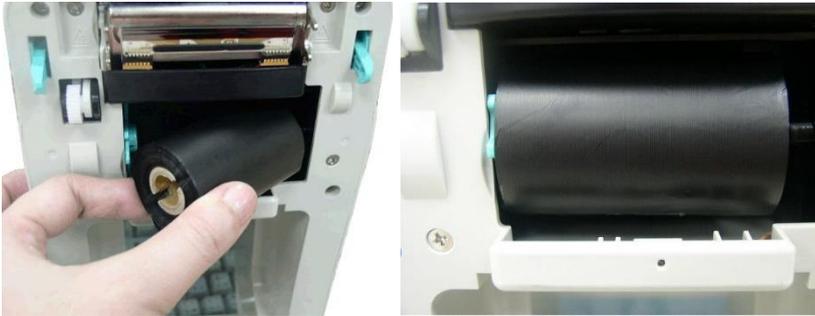
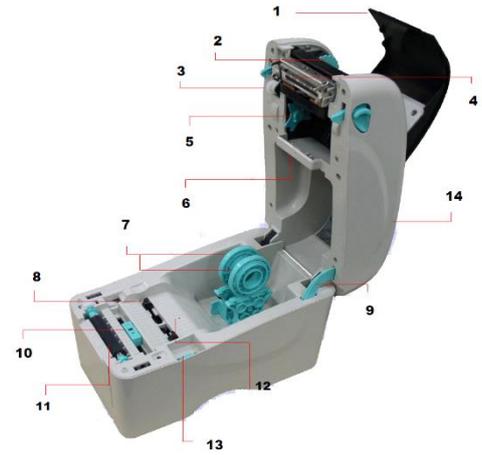
Hold the Top cover and press the top cover support to disengage the top cover support with lower inner cover. Gently close the top cover. Make sure the cover latches securely. →



Loading the Ribbon

Open the printer's top cover by pulling the top cover open levers located on each side of the printer and lifting the top cover to maximum open angle. (To this position →)

Insert the ribbon right side onto supply hub (5). Align the notches on the left side and mount onto the spokes. ↓

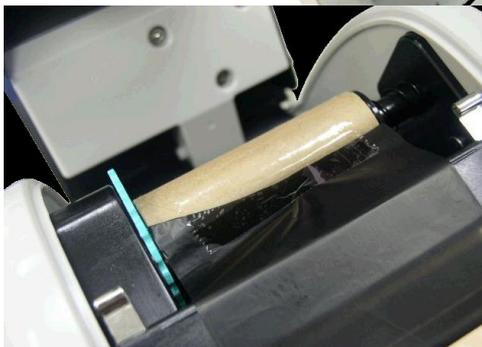


← Open the ribbon access cover.

Insert the paper core right side onto rewind hub. Align the notches on to the left side and mount on to spokes. →

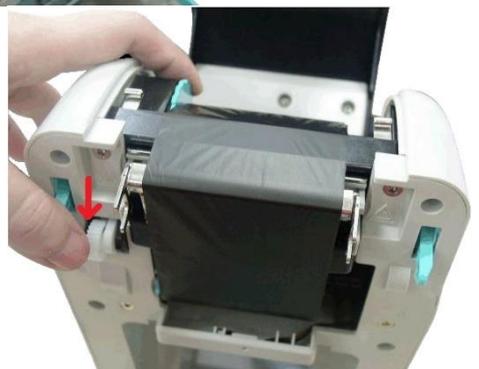


Pull the leading ribbon to pass the print head. ↓



← Stick the ribbon onto the ribbon rewind reel.

Turn the ribbon rewind gear until the ribbon plastic leader is thoroughly wound and the black section of the ribbon covers the print head. Close the ribbon access cover and the top cover. →



LED and Button Functions

This printer has one button and one three-color LED indicator. By indicating the LED with different color 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 Indicator

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

Regular Button Function

1. Feed labels

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

2. 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 blinking. Press the button again to continue the printing job.

Power on Utilities

There are six power-on utilities to set up and test printer hardware. These utilities are activated by pressing FEED button then turning on the printer power simultaneously and release the button at different color of LED.

Please follow the steps below for different power-on utilities.

1. Turn off the power switch.
2. Hold on the button then turn on the power switch.
3. Release the button when LED indicates with different color for different functions.

Power on utilities	The LED color will be changed as following pattern:						
LED color	Amber	Red (5 blinks)	Amber (5 blinks)	Green (5 blinks)	Green/Amber (5 blinks)	Red/Amber (5 blinks)	Solid green
Functions							
1. Gap / black mark sensor calibration		Release					
2. Gap / black mark sensor calibration, Self-test and enter dump mode			Release				
3. Printer initialization				Release			
4. Set black mark sensor as media sensor and calibrate the black mark sensor					Release		
5. Set gap sensor as media sensor and calibrate the gap sensor						Release	
6. Skip AUTO.BAS							Release

Dump mode

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. It allows users or engineers to verify and debug the program.

ASCII Data

```

SPEED 2.0      53 50 45 45 44 20 32 2E 30 0D
DENSITY 8     0A 44 45 4E 53 49 54 59 20 38
SET PEEL OFF  0D 0A 53 45 54 20 50 45 45 4C
DIRECTION 0   43 54 49 4F 4E 20 30 0D 0A 47
AP 3.00 mm    41 50 30 25 00 30 20 6D 6D 0A
0.0 mm        2C 30 2E 30 30 20 6D 6D 0D 0A
REFERENCE     52 45 45 45 52 45 4E 45 45 20
0.0 SET C    30 2C 30 2D 0A 53 45 54 20 43
UTTER OFF    55 54 54 4F 52 20 4F 46 46 0D
SIZE 100     0A 53 49 5A 45 20 31 36 30 2E
02 mm.05.0   30 32 20 6D 6D 2C 36 35 2E 30
4 mm.05.0    34 04 2C 31 04 39 2C 22 33 39
BARCODE 1    0A 42 41 52 43 4F 44 45 20 31
44.149.39    32 2C 30 2C 22 35 37 31 31 34
.120.1.0     22 2C 31 32 30 2C 31 2C 30 2C
SET 57114    30 2C 30 2C 22 35 37 31 31 34
PRIN 33.30   33 30 54 22 0D 0A 50 52 49 4E
T 1.1 SPE    54 20 31 2C 31 0D 0A 53 50 45
ED 2.0 DE    45 44 20 32 25 30 0D 0A 44 45
NSITY 8 S    4E 53 49 54 59 20 38 0D 0A 53

ET PEEL OF   45 54 20 50 45 45 4C 20 4F 46
DIRECTI     46 0D 0A 44 43 52 45 43 54 49
ON 0 GAP    4F 4E 20 30 0D 0A 47 41 50 20
3.00 mm.0   33 2E 30 30 20 6D 6D 2C 30 2E
0 mm.05.0   30 30 20 6D 6D 0D 0A 52 45 46
REFERENCE 0.0 45 52 45 4E 43 45 20 30 2C 30
ER OFF CUT  6D 0A 53 44 54 20 43 55 54 54
ZE 100.02   5A 45 20 31 30 30 2E 30 32 6D
mm.05.04 m  6D 6D 0A 43 43 4C 53 0D 0A 42 41
CLS BA      6D 6D 0A 43 43 4C 53 0D 0A 42 41
CODE 144    32 35 01 20 30 2C 32 2C 31
149.39.1    31 34 39 2C 22 33 39 22 2C 31
20.1.0.2    32 35 01 20 30 2C 32 2C 31
.571143BT   2C 22 55 37 31 31 34 35 38 54
.1 PRINT 1  2C 0D 0A 50 52 49 4E 54 20 31
                2C 31 0D 0A
    
```

Hex decimal data related to left column of ASCII data

- Note:**
1. Dump mode requires 2" wide paper width.
 2. Turn off / on the power to resume printer for normal printing.
 3. Press FEED button to back to the previous menu.

Printer Initialization

Printer initialization is used to clear DRAM and restore printer settings to defaults. Printer initialization is activated by the following procedures.

1. Turn off the power switch.
2. Hold on the button then turn on the power switch.
3. Release the button when LED turns **green** after 5 amber blinks. (Any green will do during the 5 blinks).
 - The LED color will be changed as following:
 - Amber → red (5 blinks) → amber (5 blinks) → **green (5 blinks)** → green/amber (5 blinks) → red/amber (5 blinks) → solid green

Printer configuration will be restored to defaults as below after initialization.

Parameter	Default setting
Speed	127 mm/sec (5 ips) (203DPI) 76.2 mm/sec (3 ips) (300DPI)
Density	8
Label Width	2" (50.8 mm)
Label Height	2" (50.8 mm)
Sensor Type	Gap sensor
Gap Setting	0.12" (3.0 mm)
Print Direction	0
Reference Point	0,0 (upper left corner)
Offset	0
Tear Mode	On
Peel off Mode	Off
Cutter Mode	Off
Serial Port Settings	9600 bps, none parity, 8 data bits, 1 stop bit
Code Page	850
Country Code	001
Clear Flash Memory	No
IP Address	DHCP

Set Black Mark Sensor as Media Sensor and Calibrate the Black Mark Sensor

Please follow the steps as below.

1. Turn off the power switch.
2. Hold on the button then turn on the power switch.
3. Release the button when LED turns **green/amber** after 5 green blinks. (Any green/amber will do during the 5 blinks).
 - The LED color will be changed as following:
Amber → red (5 blinks) → amber (5 blinks) → green (5 blinks) → **green/amber (5 blinks)** → red/amber (5 blinks) → solid green

Set Gap Sensor as Media Sensor and Calibrate the Gap Sensor

Please follow the steps as below.

1. Turn off the power switch.
2. Hold on the button then turn on the power switch.
3. Release the button when LED turns **red/amber** after 5 green/amber blinks. (Any red/amber will do during the 5 blinks).
 - The LED color will be changed as following:
Amber → red (5 blinks) → amber (5 blinks) → green (5 blinks) → green/amber (5 blinks) → **red/amber (5 blinks)** → solid green

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

This section lists the common problems that according to the LED status and other problems you may encounter when operating the printer. Also, it provides solutions.

LED Status / Color	Printer Status	Possible Cause	Recovery Procedure
OFF	No response	No power	<ul style="list-style-type: none"> * Turn on the power switch. * Check if the green LED is lit on power supply. If it is not lit on, power supply is broken. * 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.
Green with blinking	Pause	The printer is paused	* Press the FEED button to resume for printing.
Red with blinking	Error	The out of label or the printer setting is not correct	<ol style="list-style-type: none"> 1. Out of label <ul style="list-style-type: none"> * 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 <ul style="list-style-type: none"> * Initialize the printer by instructions in "Power on Utility".

Print Problem

Problem	Possible Cause	Recovery Procedure
Not Printing	Check if interface cable is well connected to the interface connector.	Re-connect 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 label	Label loaded not correctly.	Follow the instructions in loading the media.
Continuous feeding labels	The printer setting may go wrong.	Please do the initialization and gap/black mark calibration.
Paper Jam	Gap/black mark sensor sensitivity is not set properly (sensor sensitivity is not enough)	Calibrate the gap/black mark sensor.
	Make sure label size is set properly.	Set label size exactly as installed paper in the labeling 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 with printer.	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

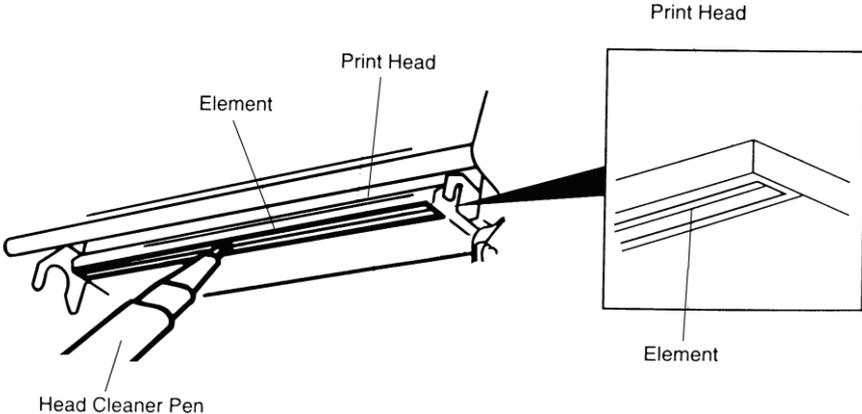
This session presents the clean tools and methods to maintain your printer.

1. Please use one of following material to clean the printer.

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

2. The cleaning process is described as following:

Printer Part	Method	Interval
Print Head	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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

Note:

- Do not touch printer head by hand. If you touch it accidentally, please use ethanol to clean it.
- Please use 100% Ethenol. 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.
- The maximum printing ratio per dot line is 15% for this printer. To print the full web black line, the maximum black line height is limited to 40 dots, which is 5mm for 203 DPI resolution printer and 3.3mm for 300 DPI resolution printer.

INSTRUMENTS

Important Information

Restrictions to the transporting of LITHIUM ION products

It has come to the attention of Wavecom Instruments Pty Ltd, that battery and /or products containing batteries are being shipped by customers through air freight. It is our understanding that, for the purpose of Air transport, lithium ion batteries are considered as dangerous goods under the International Air Transport Authority (IATA) regulations.

It is the responsibility of the shipper to ensure that the product being shipped and the packaging used comply with all regulations, noting that extensive penalties can be imposed by the relevant authorities for any breach.

The IATA and other laws and regulations covering the transport of goods are very comprehensive, and Wavecom Instruments makes no warranty that these regulations will permit particular shipments of its products by air freight.

Lithium ion batteries are not allowed to ship by air. Product that contains internal batteries are allowed as long as batteries are not damaged.

Should you require further information on the relevant regulations and requirements, please contact your dangerous goods adviser and/or review the IATA website on:

www.iata.org/ps/publications/dgr/pages/index.aspx

This letter is not intended to constitute legal advice, and you should obtain your own professional advice.

Please contact tech-support or sales support team of Wavecom Instruments Pty Ltd for more information.

Optional Accessories

500mm Earth Strap	Part No: TnT-ES 500
3-Phase Adaptor 20A & 32A 5pin + 5pin	Part No: WCM-3PH-MADP
HBC Fuse	Part No: WCM-HBC10AM205
Isolation Transformer for RCD testing	Part No: WCM-ISOT 11
Probe Kit	Part No: WCM-Probe
Wavecom Printer Labels	Part No: WCM-TAG - (Colour)
Wavecom Printer Ribbons	Part No: WCM-RIBBON
WinPATS Extended Support (12 months)	Part No: WCM-WinPATS Support
IEC 20amp-10amp Current Limited Adapter Cable	Part No: WCM-IEC2010 Suitable for TP500X Model Only

Disclaimer – E&OE

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

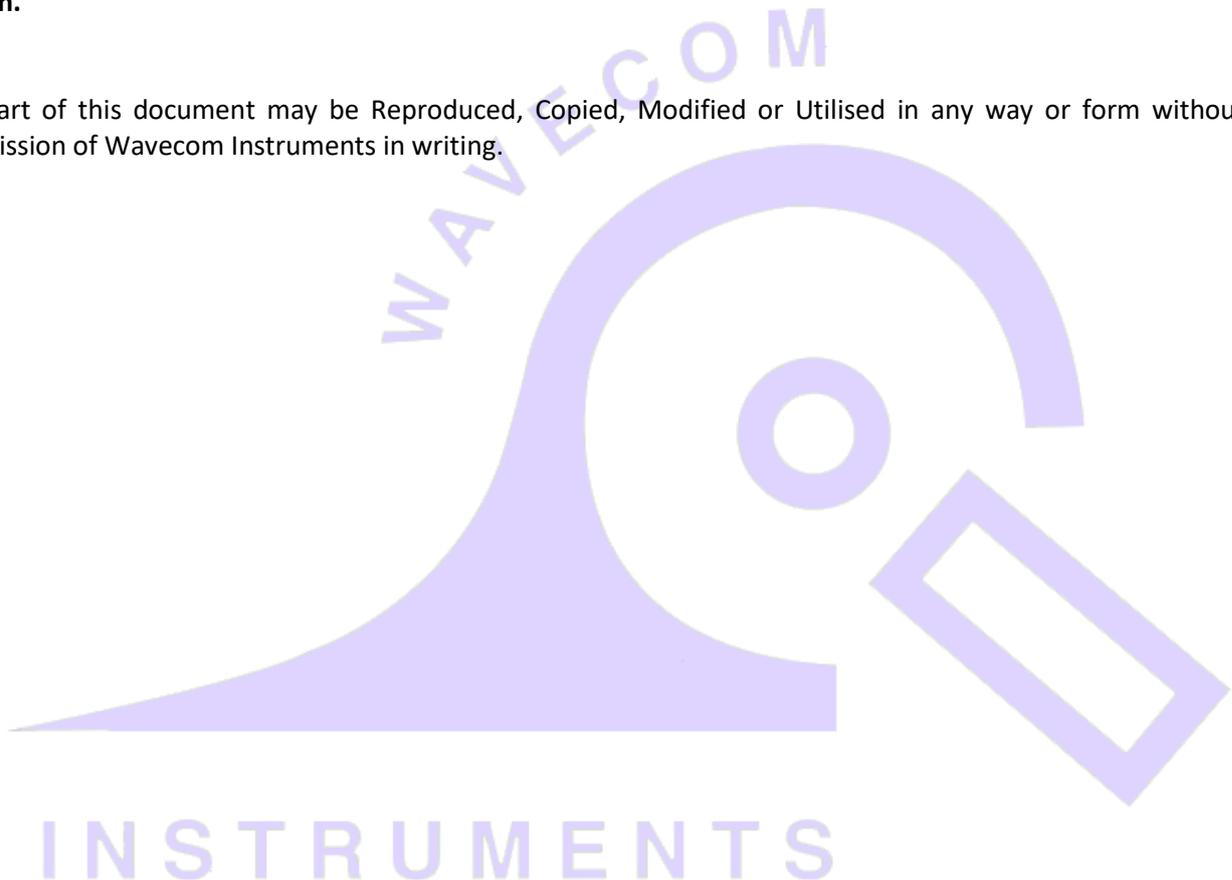
Updated Specifications & Model changes may be found on the Wavecom website: - www.wavecom.com.au

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.

This is partly based on the fact that Electronics & Electrical testing and specifications worldwide are constantly changing and that Local, State and National Regulatory Authorities may also have differing or additional requirements.

It is strongly recommended the Purchaser check Local Regulatory Standards that may be applicable in your region.

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WinPATS Professional Asset Management Software

A Full Version of **WinPATS** Software is included with models **TnP-500** (10A) & **TnP-500X** (20A).

WinPATS must be installed on a Laptop or PC from the Autorun menu on the CD provided. The USB-USB Driver supplied on the CD **must also be installed!**

***Brief Installation steps.**

Firstly, make sure you have registered **WinPATS** and have the correct REGISTRATION KEY

- ❖ Install WinPATS
- ❖ Install USB-USB Driver
- ❖ Locate Interface panel under Keyboard, USB PC socket R/H side 
- ❖ Connect from USB Port on TnP-500(X) to Laptop or PC – USB
- ❖ Check Device Manual for Comms Port Setting. See full WinPATS Manual for full details.
- ❖ Go to file option in WinPATS set Comm Port to same as the Silabs Driver Comm Port setting for communication to PC / Laptop.
- ❖ You now have the ability to upload / download data to & from the Test n Print 500(X) Unit.

***NOTE:** Please familiarise yourself with, and refer to the **WinPATS** manual for full details.

WINPATS can be downloaded from our website

https://www.wavecom.com.au/wcm_software_trails.php

INSTRUMENTS

WAVECOM TT040-50 Thermal Transfer BARCODE Printer

Please Note: there is a master POWER SWITCH at the rear r/h side of the printer. This should be left ON under all normal operation conditions.

Full instructions on the operation of the BARCODE printer can be found in the Owner's Manual located on the Main Software and Drivers CD supplied with the TnP-500 series unit.

Insert the disc into any PC, then from the Auto Run Menu select the tab for the Printer Manual. On this disc is information and operating instructions for the BARCODE printer, including steps with images on how to change the printer Media, Ribbon and general maintenance tips.

The user may either read this manual directly from the CD, or print a hard-copy for reference.



Wavecom Tags & Ribbons

Wavecom are a wholly owned and operated company who manufacture top grade Electrical Test Equipment in Adelaide Australia. 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

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 into ensuring easy and accurate scanning, this results in the user being able to conduct fast scanning without issues.

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 Tag | Part no: WCM-TAG-W (R,BI,G,O,Y, Br)

UV Tag | Part no: WCM-UV-TAG-W (R,BI,G,O,Y, Br)

Colour: (W) White, (R) Red, (BI) Blue, (G) Green, (O) Orange, (Y) Yellow (BR) Burgundy



**STANDARD TAGS
Per roll 500**

**UV TAGS
Per roll 400**

In support of the Wavecom Tags we offer two grades of ribbons which we have resourced that are very well suited for "On the spot printing" of Electrical Testing tags. Our standard ribbon (WCM-Ribbon) is recommended for locations where the printed tag is not exposed to harsh outdoor environment such as Factory, Office etc...

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 etc... 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

RIBBONS

**UV
RIBBONS**



In locations where a tag is exposed harsh chemicals or extreme heavy abrasive environments a printed tag may need additional added protection to protect the integrity of the print. Wavecom have available clear film overlays which 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 done it stays stuck.

The added benefit to users of the Wavecom tag printing units is they can print the test tag as normal. Before the tag is removed from the backing paper, or still attached to the printer, the clear laminate is placed over the printed tag. The combination of tag and overlay is then removed from the backing paper and applied to the appliance as per normal.

**Order information:
Clear Laminated Labels**

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