

Wavecom



# TnP Prime 20A

*Portable Appliance Test and Print Kit*

## User Manual

+ Certificate of Warranty and Product Support Information

# Wavecom Certificate of Warranty

Your Wavecom Appliance Tester comes with a conditional 24 month warranty.

Your warranty applies for 12 months from the date of purchase, and will be extended an additional 12 months if your Tester is calibrated within 12 months of the date of purchase (see rear cover of this manual).

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

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

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

# Product Support

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

You can register via the WinPATS App (this is done automatically during the setup process), or online at:

[https://www.wavecom.com.au/wcm\\_product\\_registration.php](https://www.wavecom.com.au/wcm_product_registration.php)

## Safety Information

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

The Manufacturer also advises that appliance testing should be conducted by a *Competent Person* who is suitably trained (see P.5 AS/NZ 3760:2010 for the definition of *Competent Person*), as well as any additional legislation or rulings in different states. If in doubt, the manufacturer suggests the user contact their responsible authority.

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

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

## Important Calibration Information

Your Wavecom Appliance Tester should be calibrated every 12 months. A correctly calibrated tester is essential for ensuring testing accuracy is maintained, and for complying with the AS/NZS 3760:2010.

To book your tester in for calibration, go to:

[https://www.wavecom.com.au/calibration\\_services.php](https://www.wavecom.com.au/calibration_services.php)

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

**For Western Australian customers:**

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

**For all other customers:**

Wavecom Calibrations  
257 Grange Road,  
Findon, SA 5023

<b>Important Information</b>	<b>5</b>
Contents	5
TnP Prime Diagrams	5
Precautions	6
<b>Operating the TnP Prime</b>	<b>10</b>
Powering on the Tester	10
Using the TnP Prime with WinPATS	10
Setting up the Barcode Scanner	16
LED Indicators	16
TnP Prime Testing Menu – Main Menu A	18
TnP Prime Testing Menu – Main Menu B	19
Meter Mode ® [Not available in Battery Mode]	24
<b>Specifications</b>	<b>26</b>
<b>Technical Information</b>	<b>27</b>
Visual Inspection	27
Class 1 (Earthed Appliance) Construction	27
Class 2 (Double Insulated) Construction	28
Testing of Electrical Equipment	28
Leakage Test	29
Earth Continuity Test	29
3 Phase Testing	29
Integrated Tests	29
No Connection No Test	30
<b>Wavecom Thermal Transfer Printer</b>	<b>31</b>
Loading the printing ribbon	32
Loading the media	34
LED and Button Functions	35
Power on Utilities	35
Gap/Black Mark Sensor Calibration	36
Dump mode	37
Printer Initialization	37
Set Black Mark Sensor as Media Sensor and Calibrate the Black Mark Sensor	38
Set Gap Sensor as Media Sensor and Calibrate the Gap Sensor	38
Troubleshooting	38
Maintenance	40
<b>Wavecom Tags</b>	<b>41</b>
<b>Other Information</b>	<b>43</b>
<b>Tester Serial, WinPATS Coupon Code &amp; Purchase Information</b>	<b>Rear Cover</b>

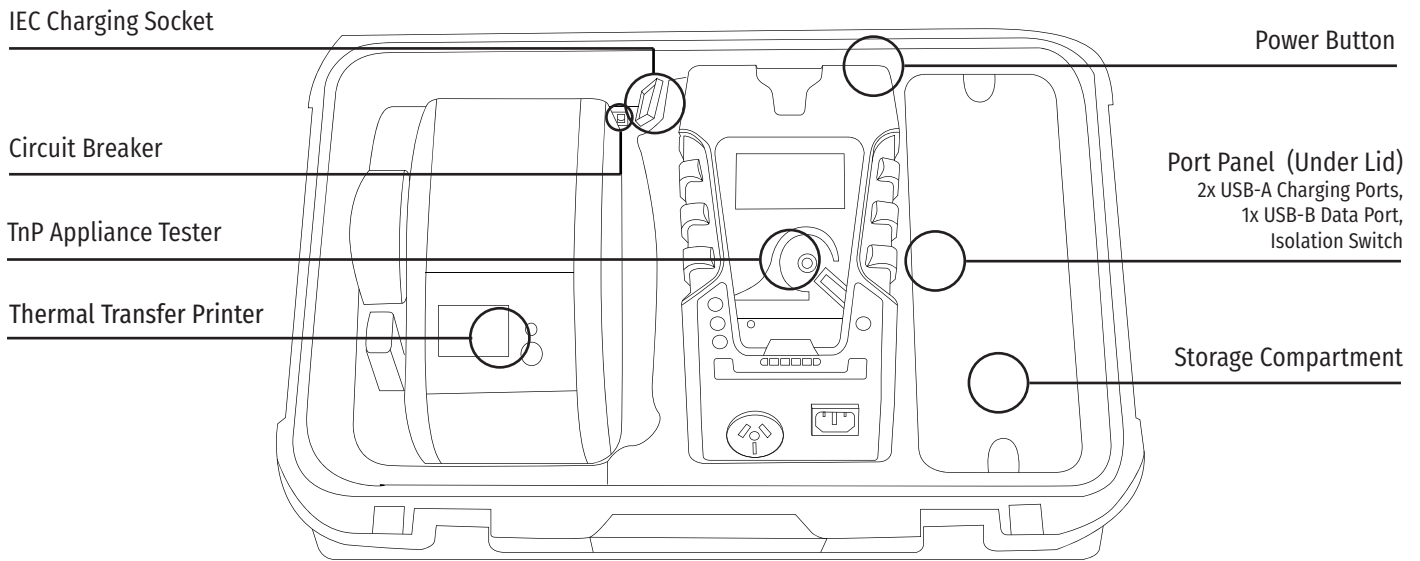
# Important Information

## Contents

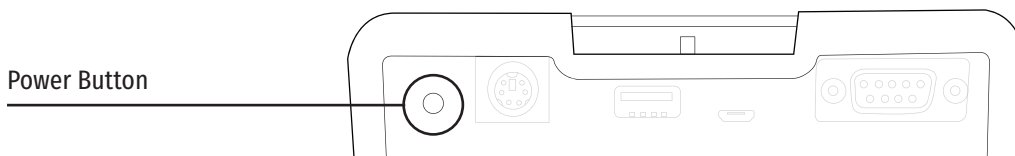
- TnP Prime Integrated Appliance Tester
- 8 inch 4G-Ready Android tablet with mount accessories
- Tablet Charging Cable
- USB-OTG Adapter
- Advanced Bluetooth Laser Barcode Scanner
- Wavecom Thermal Transfer Printer
- WinPATS voucher (valued at \$30<sup>+GST</sup>) for App Purchase through Google Playstore
- Shockproof Industrial Case (IP67 Rated)
- 1 Roll (500) of White Labels
- 1 Roll of Printing Ribbon
- IEC Test Lead (500mm Orange)
- USB A to USB B Interface Cable
- Earth Lead with Alligator Clips (1800mm Black)
- IEC Power Cable (10A units)
- IEC 20/10 Power Cable with Circuit Breaker (20A Units)
- 12 Month Calibration Certificate
- 24 Month Conditional Warranty
- User Manual
- Quickstart Guide

## TnP Prime Diagrams

### Case Diagram



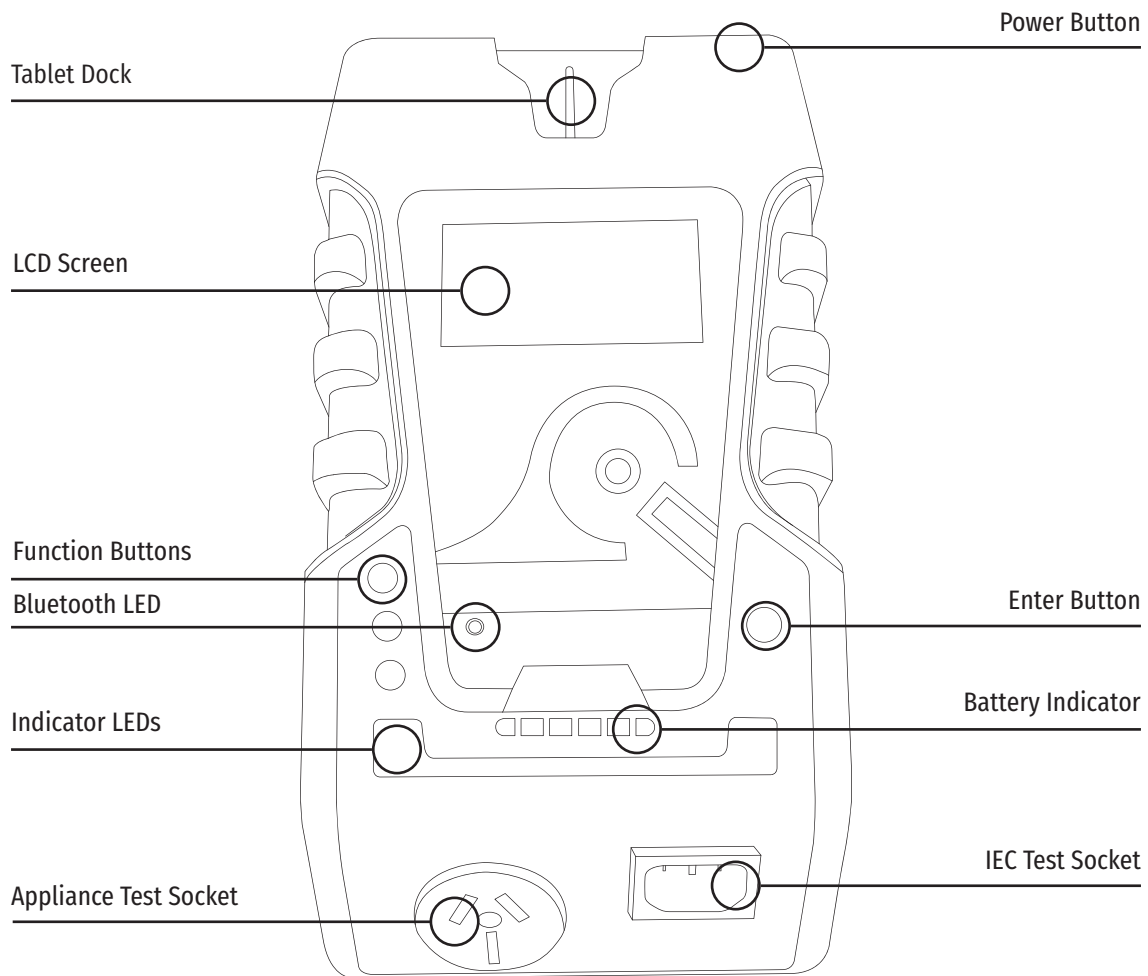
### Rear Panel of Tester Diagram



### Storage Compartment Port Panel Diagram



## Tester Diagram



## Precautions

### 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.

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.

## Using the Tablet

The TnP Prime comes with an Android tablet to be used with the WinPATS App to control your tester, save your test results and generate reports. In the next section you will find a short introduction to using the TnP Prime with your tablet, and more detailed, step by step guides are available on our website - [www.wavecom.com.au](http://www.wavecom.com.au)

The tablet provided is intended for use with WinPATS only - using additional apps (other than those already installed) may interfere with the functions of WinPATS and may slow down the app significantly. We strongly recommend that you do not install other apps on this tablet, to ensure the stable operation of the WinPATS App.

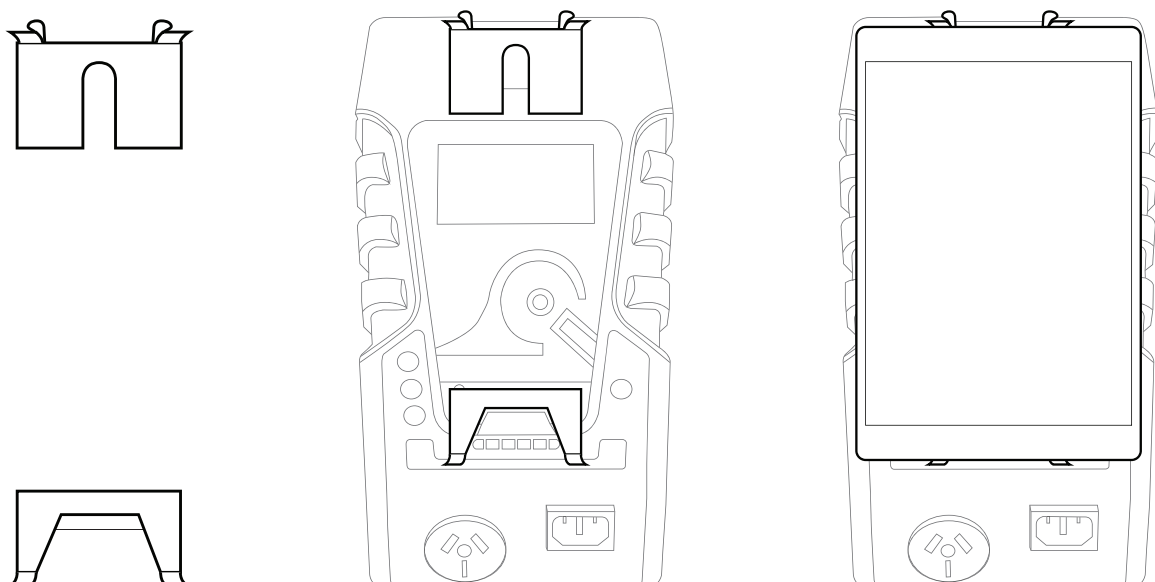
Before using your tablet with WinPATS, you must set it up as per the manufacturers instructions, and connect it to the internet (via 4G or wifi). We also recommend that the tablet is fully charged before the first use.

Your tablet warranty is covered by the manufacturer (Telstra). While Wavecom are happy to provide support to help you use your tablet for WinPATS, any issues that arise from the tablet (and not the WinPATS App) will need to be resolved with the manufacturer.

With your TnP Prime you will have two tablet docking accessories. These are to be attached to your tablet so you can secure your tablet to your TnP Prime.

To attach the docking accessories, we recommend docking them to the TnP Prime as shown below.

Then, peel off the backing plastic to expose the adhesive and place your tablet onto the docking accessories. Take care to ensure that your tablet's camera and charging port are not blocked by the docking accessories.



## Using the Lithium Ion Battery

### Using the TnP Prime on Mains Power

To use the TnP Prime on mains power, simply plug in the supplied power cable and connect it to a mains power outlet. Your TnP Prime will automatically connect to mains power and begin charging the battery.

### Using the TnP Prime on Battery Power

When unit is not connected to mains, simply press and hold the power button at the rear of the tester till unit you hear a beep and the LCD screen turns on. Use the same button to turn off the unit when in battery mode.

Mains Supply tests, Leakage tests and Meter Mode functions are not available on battery power. To perform RCD Tests, the TnP Prime is required to be connected to mains power.

**Important: Ensure that the battery isolation switch is ON while operating the unit & performing tests. The isolation switch is located inside the storage compartment**

### To Charge the Battery

Internal lithium-ion battery (98Wh, 6700mAh) can power the TnP Prime for around 3000 sets of tests. The battery is charged simply by plugging the TnP Prime into mains power, and it takes around four hours to fully charge.

*Note: Turning off the red Isolation Switch (located inside the storage compartment) isolates the battery completely and prevents the battery from charging.*

While the TnP Prime is charging and not in use, the display can be turned off by pressing and holding the ENTER button until you hear a beep and the LCD screen backlight turns off. You will then see charging information displayed on the screen. Once the battery is fully 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.

## Transporting Lithium Ion Battery Products

It has come to the attention of Wavecom Instruments Pty Ltd, that 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 **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 be transported by air.** Products that contain internal batteries are allowed, as long as the 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:

[www.iata.org/publications/dgr/Pages/index.aspx](http://www.iata.org/publications/dgr/Pages/index.aspx)

This letter is not intended to constitute legal advice, and you should obtain your own professional advice. Please contact Wavecom Instruments Pty Ltd for more information.

## ***Warnings***

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

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

When sending the TnP Prime for calibration, please turn off the battery isolation switch which is located in the storage compartment of the tester. If you have any questions about the battery of your TnP Prime please contact Wavecom for further advice.

## ***Thermal Circuit Breaker***

The TnP Prime uses a 16A rated thermal circuit breaker which will trip after 30 minutes of continual 20A testing. To avoid tripping the circuit breaker avoid running >16A tests for extended periods of time. If the circuit breaker trips, wait a short time for the breaker to cool down, then simply flip the breaker back into the on position.

# Operating your TnP Prime

## ***Powering on the Tester***

**To use your TnP Prime, ensure the red isolation switch (located in the storage compartment) is switched ON.** We recommend that the TnP Prime is fully charged before the first use.

Your TnP Prime will be powered on automatically when you connect it to mains power. To power on your TnP Prime in battery mode, press and hold the rear power button until the unit beeps and the LCD screen turns on.

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

## ***Using your TnP Prime with the new WinPATS App***

Setting up the new WinPATS App is simple, but can take some time. We recommend setting up WinPATS before you need to use it on site. You will need to download the WinPATS App from the Google Play Store onto your Android tablet. On our website, you can find a set of videos that will guide you through the various functions and features of the new WinPATS App. This guide will walk through setting up WinPATS and connecting to your tester.

Once you have downloaded the WinPATS App, open it and create up a 4 digit pin code. This will help keep your data secure.

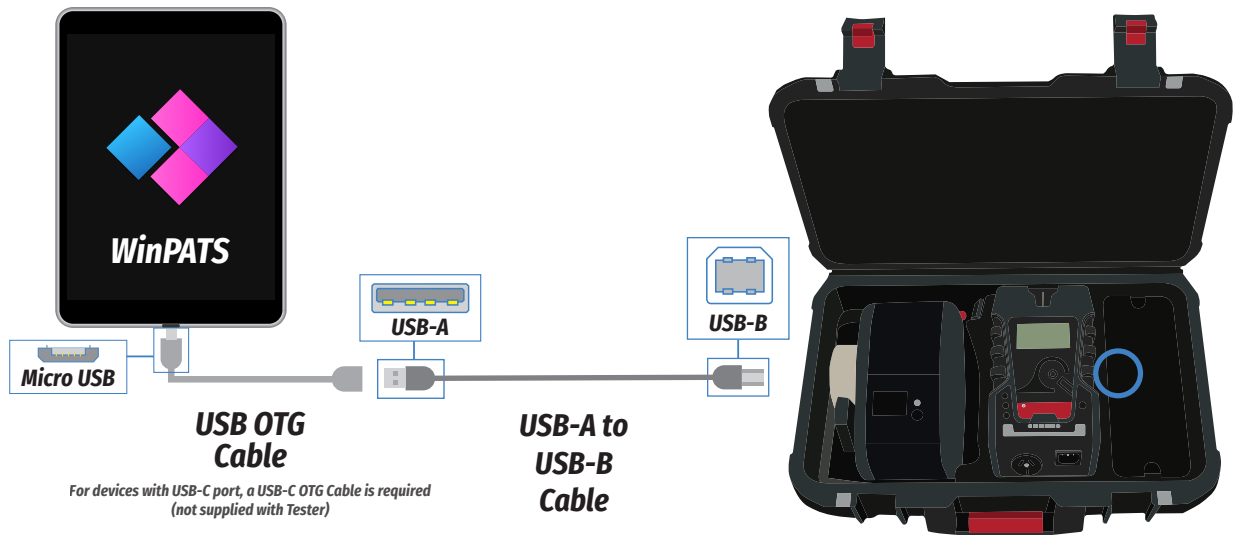
Next, it's time to set up your Company Account. If your employer or organisation has an account already, you can log in straight away using the details provided to you. Otherwise, tap Register Company to set up your Company Account - you will be prompted to enable WinPATS' permissions - this allows you to use the full set of WinPATS features.

Now, fill in your details - a valid ABN is required to register a new company. You should use the address and contact details of your head office. Once your details are entered, check they are correct, then tap Register.

You will be sent a One Time Password to the email you entered in the previous step. This is used to verify your email address - enter the OTP to continue. This OTP is only valid for 10 minutes - if your OTP expires, simply go back and then tap 'Register' again. If you don't see your OTP email, check your spam folder.

Now you can pay for your WinPATS License - you should have a coupon code on the rear of this booklet which provides you with one free license for the WinPATS App. Your coupon code is linked to your tester, and you will need to connect your Android tablet to your TnP Prime to authenticate your code. Using the USB-OTG cable supplied with your tester, connect your tablet to your tester in the following chain: *Tablet > USB-OTG > USB-A to USB B Cable > USB B port of your TnP Prime (located inside the storage compartment)*. See diagram on page 11. Then, enter your coupon code and tap APPLY. You should see the Total Amount number drop to zero. Tap PAY to proceed.

Once you have entered your code or paid, you can now Log In and set up your password. Enter the Company ID and temporary Password which was emailed to you, which will enable you to log in for the first time. You will now be prompted to set up a new password.



You can now set up your User Account - this is your individual profile. If you are the first or the only Test and Tag technician at your organisation, you should set yourself as an 'ADMIN' user, which will allow you to use the full features of WinPATS. Technician users have reduced access to features - this is designed for organisations with multiple technicians and/or multiple sites.

Once your details are complete, tap ADD to create your account. Confirm your details are correct, then tap CONFIRM to finish registering your user account.

When you start WinPATS for the first time you'll be required to perform a data sync. This creates a new cloud database for you, or connects your WinPATS App to your company's existing database. If your database has many items, this may take up to 5 minutes, but usually only takes a few seconds.

## Connecting via Bluetooth

To control your TnP Prime via Bluetooth, you will need to perform a short setup procedure. Ensure you have both your tablet with WinPATS installed, and your TnP Prime in front of you.

### *Go to the Bluetooth settings in your Tablet's settings menu*

Ensure that Bluetooth is enabled, then select your TnP Prime from the list of available devices (ensure you select the correct tester by referring to the serial number. Your TnP Prime's serial number is located on the side of your tester, and on the rear cover of this booklet).

You may now be prompted to pair your two devices using a PIN code. If so, your TnP Prime will display a code on the screen. Enter this code into WinPATS and tap OK. You will be asked to confirm the connection - tap Confirm after checking the details are correct.

*Note: If you have any issues with the PIN code, you can disable this function from the TnP Prime settings menu. Power on your TnP Prime, then hold Enter and press F2 to open the settings menu. Navigate to 'Bluetooth Configuration' and press Enter. When prompted with 'Use Security PIN for Bluetooth' select 'Disable' by pressing F3.*

### *Go to the WinPATS App*

To connect your TnP Prime, go to the Test menu in the WinPATS App (at the top of the screen). You should be prompted to connect a Wavecom Appliance Tester as soon as you open the Test Menu for the first time. Tap 'BLUETOOTH' to begin the Bluetooth setup process.

WinPATS will scan for any available TnT or TnP testers and display them in a list - select your tester from the list by tapping it. If you see multiple TnT or TnP products in the list, use the serial number of your TnP Prime to identify your tester.

You will now be asked to register your TnP Prime - this allows you to receive product support, service and calibration reminders from Wavecom. Once complete, tap Register. You're now ready to start testing with WinPATS!

## Connecting via USB

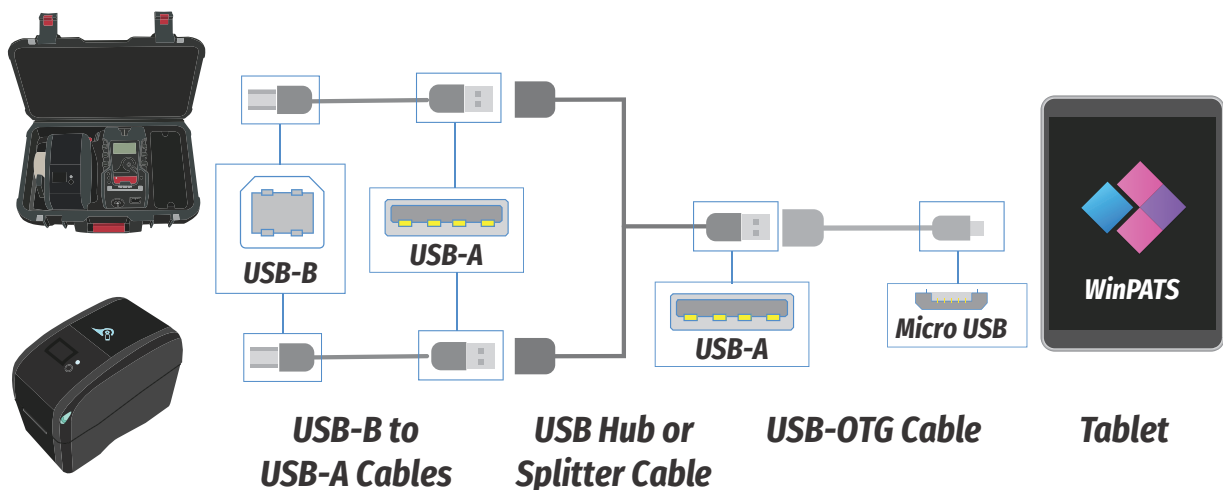
You can also connect to your TnP Prime via USB if needed. Follow the following diagrams to connect your TnP Prime to your tablet or PC, with or without your printer. Please note that you need to connect your printer in addition to your TnP Prime as shown.

### Connecting your TnP Prime to your Tablet via USB

To connect your TnP Prime to your tablet via USB, you will need:

- A USB-A to USB-B cable (1 Included)  
(2 Cables are required if connecting your TnP Prime and your Printer)
- A USB Hub or USB Splitter cable
- A USB-OTG Cable (Included)

Connect your cables in the sequence shown below. Your TnP Prime USB-B port is located inside the storage compartment, and the Printer USB-B port is located at the rear of the printer. Once connected, open WinPATS on your tablet. You should see the Test icon and the Print icon (if you connect the printer) at the top of the screen change to green.

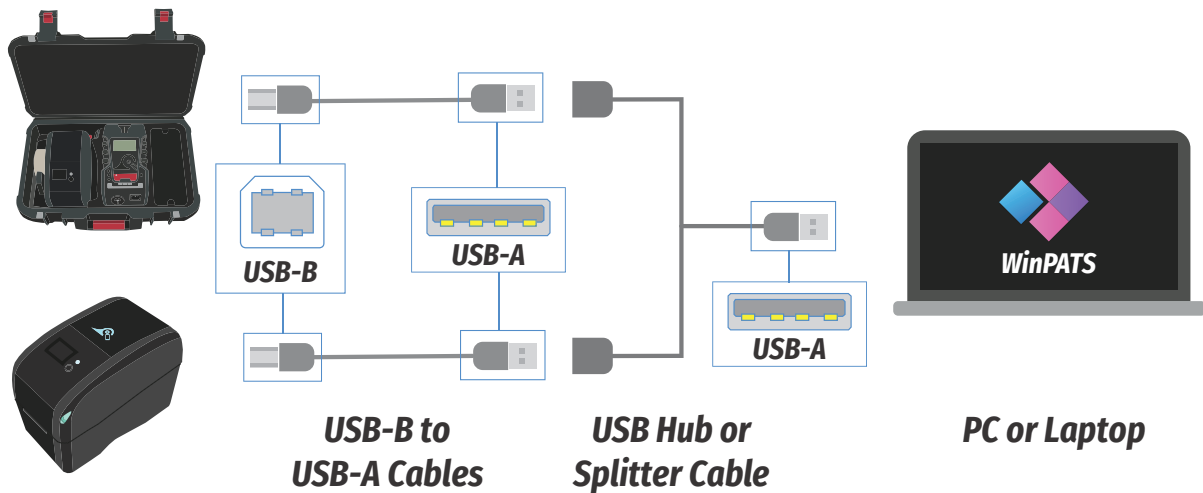


### Connecting your TnP Prime to your PC via USB

To connect your TnP Prime to your PC via USB, you will need:

- A USB-A to USB-B cable (1 Included)  
(2 Cables are required if connecting your TnP Prime and your Printer)
- A USB Hub or USB Splitter cable

Connect your cables in the sequence shown below. Your TnP Prime USB-B port is located inside the storage compartment, and the Printer USB-B port is located at the rear of the printer.



## Adding a User

*Note: You will have already created a WinPATS User during the setup process. Follow this process to add another user, or to edit the details of your users. This feature requires Admin access, Technician level users will need to enter the Company Password to access this feature.*

**Important: To avoid duplication of data a User must only be logged in and active on one tablet at a time.**

To add a new User to WinPATS, open the Side Menu, then tap the User Profile Picture at the top of the menu. If required, enter the Company Password. You can now view the Users at your company using the dropdown menu, then edit, suspend (lock the user but keep the profile) or delete the user.

To add a new User, tap the '+' symbol next to the dropdown menu. Fill out the form, including selecting a profile picture and assigning Admin permissions (if required), then tap 'Add' when complete. You can now select this user from the dropdown menu.

When changing users, select your user from the menu, then tap 'Confirm' to switch to that user.

## Adding a Customer

*Note: You can also add a new customer during the 'Adding an Item' process if needed.*

To add a new Customer to WinPATS, open the Side Menu, then tap 'Database+', then tap 'Customers'. You can view your existing customers in the list, and add a Site, edit their details and delete the customer by tapping a customer in the list.

Tap 'Add Customer' to open the new Customer form. Fill out the form - please note, a valid ABN is required to add a new customer. When complete, tap 'Add Customer'. You will now be able to assign sites and items to this customer.

## Adding a Site

*Note: You can also add a new site during the 'Adding an Item' process if needed.*

To add a new Site to WinPATS, open the Side Menu, then tap 'Database+', then tap 'Sites'. You can view your existing sites (and filter by Customer) in the list, and edit or delete your sites by tapping a site in the list.

Tap 'Add Site' to open the new Site form. Fill out the form, and tap 'Add Site' when complete. You will now be able to assign locations (places within a site) and items to this customer.

## Entering a New Item

To add a new item to WinPATS, open the Side Menu, then tap 'Database+', then tap 'Add Equipment'. Fill out the form, including selecting the Customer and Site. Set the Current Status, Test Frequency and Test Sequence - this allows WinPATS to tell your TnP Prime which test to run when you test this item.

If you wish to add multiple versions of your item (for instance, if your company has purchased 5 identical new printers), you can change 'Add Multiple Identical Equipment' to 'Yes'.

When you have added all the information to your item, tap 'Add Equipment'. You can now test this item by searching for it in your database.

## Testing Items

*Note: There are multiple ways an item can be tested using WinPATS. This part will cover the two most common methods. Both of these methods require that your TnP Prime to be connected to your tablet (see above 'Connecting via Bluetooth').*

### Testing from the Test Menu

At the top of the WinPATS home screen you should see the 'Test' icon. Tap this to open the Test Menu. Here you will see 6 options:

<b>Quick Test</b>	This allows you to run a test first, then create an item or assign the results to an existing item after the test is complete
<b>New Test</b>	This allows you to select an existing item from your database, or add a new item, then conduct tests on it. Using this method means you can use the 'Test Procedure' assigned to the item to run the test, meaning you don't need to manually select a test.
<b>New to Service</b>	This is the same as 'New Test', but will categorise the item as 'New to Service'
<b>Out of Service</b>	This is the same as 'New Test', but will categorise the item as 'Out of Service'
<b>Visual Check Only</b>	This is the same as 'New Test', but will categorise the item as 'Visual Check Only'
<b>Data Logger</b>	This feature is still in production

Select the best option for your situation. If you select **Quick Test**, select the test you wish to conduct from the list. Set up the item to be tested by plugging it into the TnP Prime (along with any accessories as required), adjust any options (such as test voltage), then tap 'Start Test'.

Conduct the Visual Test, and if the item passes, the test will be conducted in stages automatically, and the results displayed on screen. If you wish to continue without saving, simply tap the 'Home' button. If you wish to save these results, tap 'Save Results'.

You will be taken to a screen where you can either search for an item in your database, or add an existing item. Follow the relevant steps and your test results will be assigned to the item you select/create. If required, you can print a tag at the end of this process. Otherwise you can now continue with your testing.

If you select **New Test** (or New to Service, Out of Service, or Visual Check Only), you will create or select the item you wish to test first. Either search for an existing item in your database, or add a new item.

Once you have created/selected the item, review the Assigned Test Sequence and ensure the correct test will be conducted. Set up the item to be tested by plugging it into the TnP Prime (along with any accessories as required) then tap 'Start Test'.

Conduct the Visual Test, and if the item passes, the test will be conducted in stages automatically, and the results displayed on screen. Your results will be saved, and you can now print your tag (or save it to the Print Queue to print later). You can now continue with your testing.

### *Testing from the Item Information Screen*

You can also conduct tests from the Item Information Screen. If you: Search for an Item from the Asset Lookup on the Home Screen, scan a barcode or find the item in your Inventory (Side Menu > Database+ > Inventory). Once you are on the Item Information screen, review the Assigned Test Sequence and ensure the correct test will be conducted.

Set up the item to be tested by plugging it into the TnP Prime (along with any accessories as required) then tap 'Start Test'. Conduct the Visual Test, and if the item passes, the test will be conducted in stages automatically, and the results displayed on screen. Your results will be saved, and you can now print your tag (or save it to the Print Queue to print later). You can now continue with your testing.

## **Printing Tags**

The WinPATS App can print tags to your TnP Prime printer via Bluetooth. You can print tags at the end of a test as part of the testing process, or save tags to print later from the Print Menu.

To print a tag during the test process, carry out the test as described above. Once the test is complete, tap 'Save Result'. After the result is saved, you will see the 'Save Result' button change to 'Print Tag'. To print a tag now, tap this button. To save a tag to print later, tap the arrow at the bottom of the screen (in the centre). This will open a sub menu, including the option 'Print Later'. Tap this to save the tag to print later from the Print Menu.

To access to Print Menu, tap the 'Print' icon at the top of the Home Screen. You will see a list of tags that have been saved to print later. To print a tag from the list, tap on it. You will see a number of options appear: Print Tag, Print Mini and Delete. To print a standard tag, tap 'Print Tag'. To print a small form tag, tap 'Print Mini'. To delete the item from the print menu, tap 'Delete'.

You can also adjust print settings and more by tapping the  'More' symbol above the list of tags.

## Editing Items

Items in your database can be edited from the Inventory screen. To open the Inventory screen, open the Side Menu, tap 'Database+' then 'Inventory'. Double tap (or press and hold) an item in the Inventory list to open the Item Information screen.

You can then tap 'Update Details' to change any of the details of the items. You can then edit any of the fields, and tap 'Update Item' when complete.

You can also edit multiple items at once - view the 'Managing your Inventory with WinPATS' video on the Wavecom Youtube channel for more information.

## Deleting Items

Items in your database can be deleted from the Inventory screen. To open the Inventory screen, open the Side Menu, tap 'Database+' then 'Inventory'. Double tap (or press and hold) an item in the Inventory list to open the Item Information screen. Tap 'Update Details', then scroll to the bottom of the 'Update Details' screen and tap the red Trash icon to delete that item.

## Setting up the Barcode Scanner

To use the supplied Bluetooth 1662 BT scanner you will need your tablet and Bluetooth scanner in front of you. Your Bluetooth scanner comes with a quick start guide which may be useful for troubleshooting, but you can set up your scanner using the following instructions. We recommend that you ensure the scanner is fully charged before using it on site.

First, ensure the battery is installed in your barcode scanner. The LED on your scanner should begin flashing blue, indicating it is ready to be paired to your tablet. Now, open the Bluetooth Settings menu of your tablet and turn Bluetooth on (if it is not already on). Tap 'Pair New Device' to begin scanning for Bluetooth devices.

Your scanner should appear in the list - you can identify your scanner by the first 4 numbers "1662" followed by the serial number (e.g 1662CFJ000123). The serial number of your scanner is located on the label of your scanner box. Tap your scanner in the list to pair it with your tablet. If you see a prompt to enter a PIN code, simply tap 'Pair' without entering anything - the PIN setting is disabled by default on the scanner and is not required.

Your scanner should now be paired with your TnP Prime. To test your scanner, open the WinPATS App and return to the Home screen. Scan one of the barcodes on the outside of the scanner box, and you should see the barcode appear in the 'Search Barcode' field on screen.

**Important: After pairing the barcode scanner, you may find that the on screen keyboard of your tablet no longer appears when you tap a text field. To fix this, tap any text field (such as the 'Search Barcode' field on the WinPATS home screen). You will see a keyboard icon appear in the bottom right corner of your screen. Tap this icon, then turn 'Show Virtual Keyboard' on. Your tablet will remember this setting and will display the keyboard from now on.**

If you encounter any issues consult the quick start guide included with the scanner, or contact us for support.



## LED Indicators

### Battery LEDs

The battery LED indicators display how much charge is remaining in your TnP Prime. Use the table below for reference.

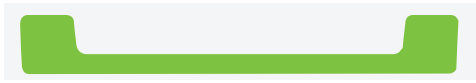
	100% - Battery is fully charged
	80%
	60%
	40%
	20% (LED 2 will be flashing)
	0% (LED 1 will be flashing)

### Indicator LEDs

The indicator LEDs are used to display various statuses and results. Use the table below for reference.

	TnP Prime is running on battery power, no Bluetooth connection
	TnP Prime is running on battery power, active Bluetooth connection
	TnP Prime is running on mains power, and is charging, no Bluetooth connection
	TnP Prime is running on mains power, and is charging, active Bluetooth connection
	TnP Prime is fully charged, no Bluetooth connection
	TnP Prime is fully charged, active Bluetooth connection
	When an appliance fails a test, the Indicator LEDs will turn red while the test results are on screen
	When an appliance passes a test, the Indicator LEDs will turn green while the test results are on screen

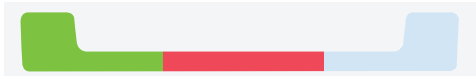
If there is a fault with the mains power connection, you may see one (or more) of the Indicator LEDs turn red. This may indicate a serious issue with the mains power supply - consult a qualified professional before proceeding. This won't apply when using battery power.



Standard Mains Supply Test result with no issues.



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



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

You may also see more than one, or all of these turn red. For more information, see Mains Supply Test (Page 26)

## TnP Prime Testing Menu – Main Menu A

If you are using your TnP Prime with the WinPATS App, you do not need to operate the TnP Prime manually - all functions can be controlled directly from the App.

### Class 1 - Earthed Appliance Test - Menu A - F1

**The Class 1 Test completes the following sequences as part of its procedure:**

- Integrated Supply Mains Test - Refer to Integrated Test section
- Integrated NCNT Test - Refer to Integrated Test section
- Earth Bond Test (@ 200mA): 200mA test current, pass level less than 1Ω
- Insulation Test (@ 250V or 500V): pass level greater than 1MΩ

*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 AS/NZS:3760 Standard. Should it still fail, remove it from service. (Refer to the Technical Information section to change test voltage).

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

#### Procedure:

1. Complete a Visual Inspection.
2. Plug device into appliance test socket.
3. Plug the IEC Clamp Cable into the IEC socket of the TnP Prime
4. Connect earth clip to any exposed metal on the device. If this is not possible, you can use a metal mesh braid to establish an earth connection (sold separately)
5. Navigate to Main Menu A, then Press the F1 key to begin the test
6. The test will be conducted
7. Once complete, read and record results appropriately

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.

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

**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 1M $\Omega$

**Procedure:**

1. Complete a Visual Inspection, and inspect the compliance plate to ensure the appliance is a Class 2 appliance. Look for the double insulated symbol, seen here.
2. Plug the appliance into the appliance test socket of the TnP Prime
3. Navigate to Main Menu A, then Press the F2 key to begin the test
4. Read and record results appropriately



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.

*Note: 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. Always read the compliance plates before testing, especially on surge protected powerboards. If unsure always refer to the AS/NZS:3760:2010 Standard. Should it still fail, remove it from service.*

## Lead Test (Extension Lead Test) – Menu A - F3

*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.*

**The Lead Test completes the following sequence as part of its comprehensive testing procedure:**

1. Integrated Supply Mains Test - Refer to Integrated Test section
2. Earth Bond Test (@ 200mA): 200mA test current, pass level less than 1 $\Omega$
3. Insulation Test (@ 250V or 500V): pass level greater than 1M $\Omega$
4. Continuity and Polarity Test 240VAC @ 2mA Checks continuity & polarity of leads

**Procedure:**

1. Complete a Visual Inspection
2. Plug in the IEC-550 Orange Lead adaptor lead supplied into the IEC socket.
3. Plug male end of extension lead or power board into the appliance test socket.
4. Connect the IEC-550 Orange lead to your extension lead
5. Navigate to Main Menu A, then Press the F3 key to begin the test
6. Read and record results appropriately.

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.

## **TnP Prime Testing Menu – Main Menu B**

Use the Enter button to switch between Menu A and Menu B. All tests on Menu B require a Mains Power source.

### **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. 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

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.

**The Power Test completes the following sequence as part of its comprehensive testing procedure:**

1. Integrated Supply Mains Test - Refer to Integrated Test section
2. Power Test

**Caution:** Before operating ensure the equipment is firmly secured to eliminate the possibility of causing injury or damage. This function will power the appliance on, and in the case of appliance with movable parts these parts may begin to move. Ensure the appliance can power on safely before proceeding.

#### **Procedure:**

1. Complete a Visual Inspection. If the unit passed the Visual Inspection, continue with the following instructions. If not, refer to the First Test section.
2. Ensure the appliance is safely located and secured, as it will be powered and operational during this test.
3. Plug male end of appliance into Appliance Test Socket.
4. Press F1 to start the power test.
5. A warning message will appear on screen. If the appliance is safely located and secured press F3 to proceed. The unit will power on.
6. Read and record results appropriately.
7. Once the appliance has powered down and the test is complete, unplug the unit.
8. Press Enter to return to the main menu.

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

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.

## Leakage / Run Test – Menu B – F2 ‘

*Note: Leakage Tests can only be conducted when connected to mains power.*

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

This test determines errors of leakage not otherwise detected in a normal insulation test. If there are any doubts with insulation testing of the equipment, the Standard (AS/NZS:3760) allows for a leakage test to be carried out instead. The TnP Prime has 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 TnP Prime will read well in excess of the limits set in mA. However, should the supply circuit be protected by an RCD this device will trip anywhere between 10 to 30mA and trip the mains supply switch OFF. The Leakage Test allows the user to operate the appliance in normal operation conditions and measure its Operating Leakage current. The displayed parameter is mA. The mA Display Range 0.0 to 22.0 mA.

A predefined value for individual class types is programmed into your TnP Prime. These limits are set according to the AS/NZ3760. Should these values change in future it can be simply altered in firmware. The run time period can be adjusted (by 5 second increments). The value can be changed by selecting the leakage test time in the 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.

**Caution:** Before operating ensure the equipment is firmly secured to eliminate the possibility of causing injury or damage. This function will power the appliance on, and in the case of appliance with movable parts these parts may begin to move. Ensure the appliance can power on safely before proceeding.

### 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. Ensure that the appliance is safely located and secure as it will be powered and operational during this test.
  3. Plug the appliance into the Appliance Test Socket of the TnP Prime
  4. If testing a Class 1 Appliance, plug the IEC Clamp Cable into the IEC socket of the TnP Prime, then clamp it onto earthed metal on the appliance
  5. If testing an RCD, plug the IEC-550 Orange Cable into the IEC socket of the TnP Prime, then plug it into a socket on your RCD and turn that switch on
  6. Navigate to Main Menu B, then press F2 to enter the Leakage Test Menu
  7. Press a function key to start the test
    - F1 = Earth Leakage, limit set to MAX then 5mA fail
    - F2 = Double Insulated Leakage and Extension Leads, limit set to MAX then 5mA fail
    - F3 = RCD Leakage (not a full RCD Trip Time or Ramp Test)
  8. The TnP Prime will conduct the first part of the test without powering the appliance
  9. A warning will be displayed on screen - ensure the appliance is safely located, then press F3 to power the appliance and continue the leakage test
  10. Your results will appear on the screen - you can now print the tag and unplug the appliance
- If the result was a **PASS** - Tag with 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.

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

### Before Testing

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 may 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 Isolation Transformer be used. Wavecom Instruments offer an Isolation Transformer, designed specifically for the purposes of field RCD tripping. Do not use these transformers for any other purpose. Rated 240VAC In, 240VAC Out @ 30VA. Fuse protected, Primary Winding 500mA.

### Types of RCD

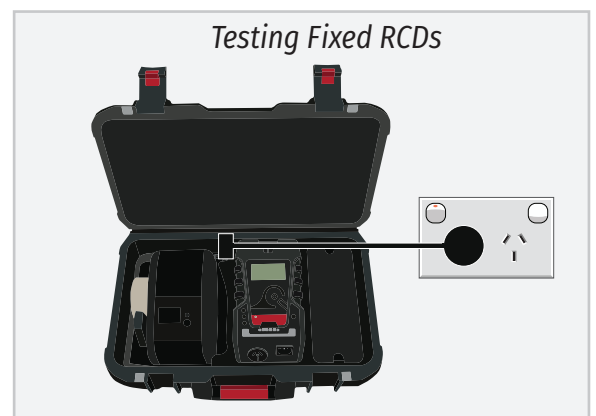
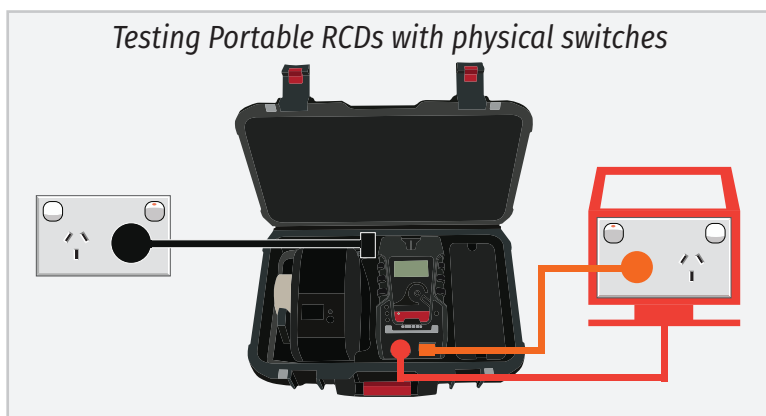
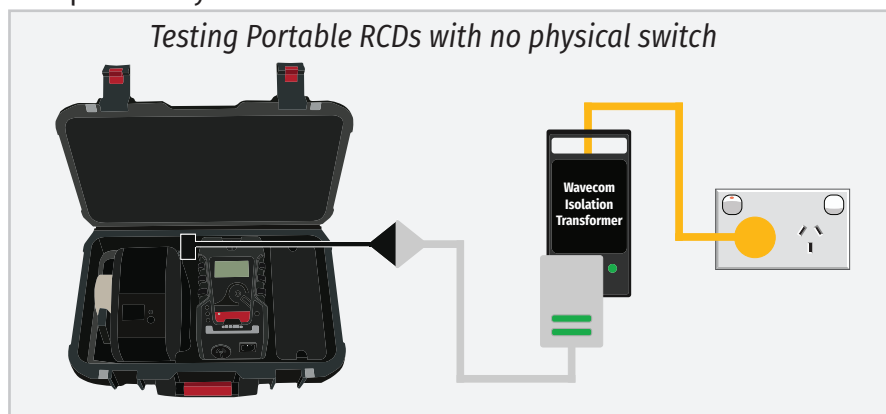
There are two types of RCD - Type 1 and Type 2:

Type 1 - 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 2- 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.

### RCD Testing Setp

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



### *RCD Trip Time Testing:*

This test is designed to trip RCD devices at a fixed current and to determine the trip time of the RCD device. During an RCD Trip Time test, the TnP Prime injects a true fault current value using a real-time compensation calculation of the actual voltage at the time of test, delivering a true and accurate trip current. The TnP Prime will measure the time the RCD takes to trip in milliseconds, and display it on the screen. This function is factory set to 30mA for fast testing, but the user can set the current to x0.5, x1.0 or x5.0 using the RCD Multiplier.

#### *For example:*

30mA \* 0.5 = 15mA

30mA \* 1.0 = 30mA - This also is effective on any set test current of the RCD tester from 5mA to 500mA output.

30mA \* 5.0 = 150mA

These tests should result in no-trip, trip & fast trip times respectively.

To enter the RCD menu from Main Menu B, press the F3 button. Then, to set up a Trip Time Test, press F1. Before performing an RCD Trip Time Test, the TnP Prime should be configured to ensure an accurate result.

### **RCD Test Options:**

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

### **Adjusting the current level:**

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

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

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

Enter - Sets the selected current for the next trip time test. The TnP Prime 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.

F1 - Sets RCD Type to Type 1

F2 - Sets RCD Type to Type 2

You will be prompted to enable or disable Portable RCD (PRCD) testing - unless you are testing a switchboard RCD, turn PRCD on.

### **Conducting the Trip Time Test**

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. Navigate to Main Menu B, and press F3 to enter the RCD Menu, then press F1 to select Time Test
3. Press F3 to enter the Time Test options menu, to ensure your TnP Prime has the correct settings for the type of RCD (cont...)

4. (cont...) Once your TnP Prime is set up correctly, select either the 0° (Positive) or the 180° (Negative) Phase to test. Both phases should be tested, and after the first test, you can select 'Retest' to test the other phase.
5. When ready, press F3 to begin the test - the RCD will trip, and the time will be recorded in milliseconds.
6. TnP Prime testers will switch to battery power (if charged) and stay on, but will need to be Mains Powered again to conduct further RCD tests.
7. You can now retest the other phase of the RCD, or simply print your tag and record your results.

### *RCD Ramp Testing*

This test is designed to trip RCD devices using a ramping up current value, to determine the trip current of the RCD device. This useful test allows the user to determine circuit leakage load/pre-loading of RCD circuit. This can assist in determining nuisance tripping issues (RCD is too sensitive) or determining RCD performance if suspected faulty or inconsistent in performance. The TnP Prime has a nominal leakage current of 2mA, which should be added to the result of test.

E.g. if RCD tripped at 22mA, add 2mA to get a value of 24mA trip current.

To enter the RCD menu from Main Menu B, press the F3 button. Then, to set up a Ramp Test, press F2. Before performing an RCD Ramp Test, the TnP Prime should be configured to ensure an accurate result.

#### **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.

F1 - Sets RCD Type to Type 1

F2 - Sets RCD Type to Type 2

You will be prompted to enable or disable Portable RCD (PRCD) testing - unless you are testing a switchboard RCD, turn PRCD on.

#### **Conducting the Ramp Test**

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. Navigate to Main Menu B, and press F3 to enter the RCD Menu, then press F2 to select Ramp Test
3. Press F2 to select your RCD Type, and turn Portable RCD testing on or off
4. Press F3 to begin the test - the TnP Prime will increase the current to the RCD until it trips, displaying the current on screen.
5. TnP Prime testers will switch to battery power (if charged) and stay on, but will need to be Mains Powered again to conduct further RCD tests.
6. You can now print your tag and record your results.

### **Meter Mode®**

#### **Meter Mode Features**

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

### Typical Applications

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

### How to use Meter Mode

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

### Explanation of Electrical Parameters

#### **Volts**

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

#### **Amperes (aka Amps)**

An amp is the unit used to measure electrical current as it flows past a specified point.

#### **Watts**

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

#### **Volt-Amps**

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

#### **Watts 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

### 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. In doubt please consult a qualified electrician when unsure or perform proper test procedures.

# TnP Prime Specifications

## *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 1.0  $\Omega$ . Measurement: 0.01 $\Omega$  to 10  $\Omega$ .

Insulation Test: 500VDC / 250VDC. Pass level Greater than 1M  $\Omega$ . Measurement: 0.1 $\Omega$  to 10M $\Omega$ . \*See also Leakage Test

## *Class 2 Double Insulated Appliance*

Appliance Check: Ensures appliance is plugged in and turned on.

Insulation Test: 500VDC / 250VDC. Pass level greater than 1M $\Omega$ . Measurement: 0.1 $\Omega$  to 10M $\Omega$ . \*See also Leakage Test

## *Extension Leads*

Earth Bond Test: 200mA test current. Pass level Less than 1 $\Omega$ . Measurement: 0.01 $\Omega$  to 10.0 $\Omega$ s

Insulation Test: 500VDC / 250VDC. Pass level Greater than 1M $\Omega$ . Measurement: 0.1 $\Omega$  to 10.0M $\Omega$ .

Continuity/Polarity Test: 250VAC check continuity and polarity of leads. Displays Pass/Fail.

## *Leakage Test*

Leakage Current: 0 to 30.0mA at 200 to 265V

Earth Leakage Test: 240VAC Mains. Pass level 1, 2.5, 5.0 mA leakage test levels with up to 10 Amp load operation (20 Amp load for TnP Prime 20A)

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 Prime 20A)

Voltage: 200 to 265VAC

Power Factor: 0.00 to 1.00

Apparent Power: 0 to 2400VA

Power: 0 to 2400W

## *Meter Mode<sup>®</sup>*

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

# Technical Information

## Visual Inspection

*Visual inspection has to be done before any other test is carried out using any of the range of TnP Prime appliance testers.*

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

- There is no damage or component defects to the accessories, plugs, outlet sockets or connectors (physical).
- There are no cracks &/or abrasions.
- There are no exposed inner cores or conductors (flexible) and the supply cords are not twisted or distorted.
- Any Fuse / 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.**

## **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 Prime 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 appliance plugged into the TnP Prime appliance testers' test socket. The Maximum allowable limit is less than 1.0Ω.

## ***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 Prime Range of appliance testers, these concerns are alleviated.

The TnP Prime can safely test electronic equipment as the tests are carried from Active-Neutral (shorted by a relay inside the tester) to Earth. In this mode no dangerous voltages pass through to the internal components of the appliance, or Device Under Test ('DUT'). If these tests are done using an Insulation Tester and the user tests Active to Neutral, this could potentially cause damage.

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 the DUT should be retested. If the 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 Prime.

## 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 Prime is designed to perform these tests).

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

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-Alligator Clip lead or optional accessory 'WCM-Probe kit'.*

The TnP Prime 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

The Earth Bond test duration can be controlled by the user by pushing the ENTER button during the test. This will extend the test time by 30 seconds. The TnP Prime will then add 30 seconds to the test time for each additional time you press ENTER. This feature has been incorporated to provide extra time to achieve an adequate physical connection, or confirm any possible INTERMITTENT issues. There may be situations where the condition of equipment, coatings applied, or suspect wiring breaks may alter the earth connection path of the device under test. This may save time by prolonging tests instead of conducting multiple iterations of the same test.

## 3 Phase Testing

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

3 Phase appliances can be tested by the TnP Prime 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.]

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. TnP Prime defaults to 500VDC, and will revert back to that when restarted.

## Integrated Tests

### Mains Supply Test

*Note: The Mains Supply Test only applies when connected to Mains Power - if you are using your TnP Prime in battery mode, you can disregard this.*

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.

If the central N-E light is on (red) 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 Prime supply. (If working with a generator or inverter, this is most likely to occur and you may need to consult an electrician before proceeding).

If both the A-E & A-N (green) lights are on but not the N-E (red), the Mains Supply Test has passed and you can continue with your testing.

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.

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

## **No Connection No Test**

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

If for some reason the NCNT 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 Prime 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.

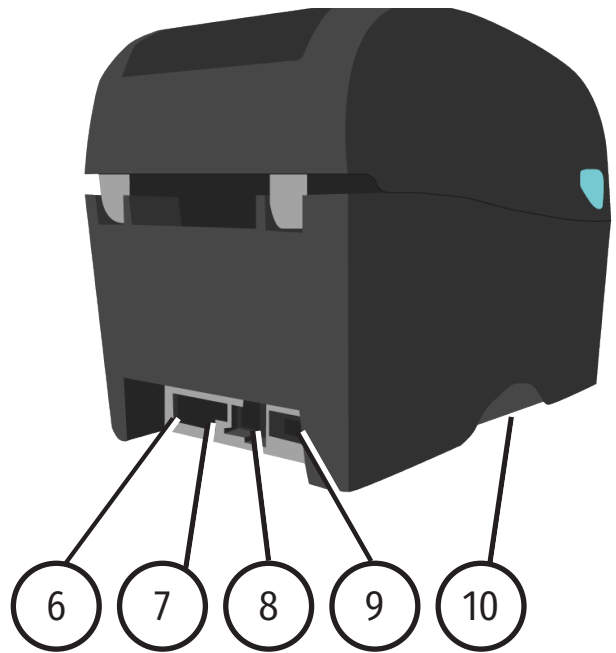
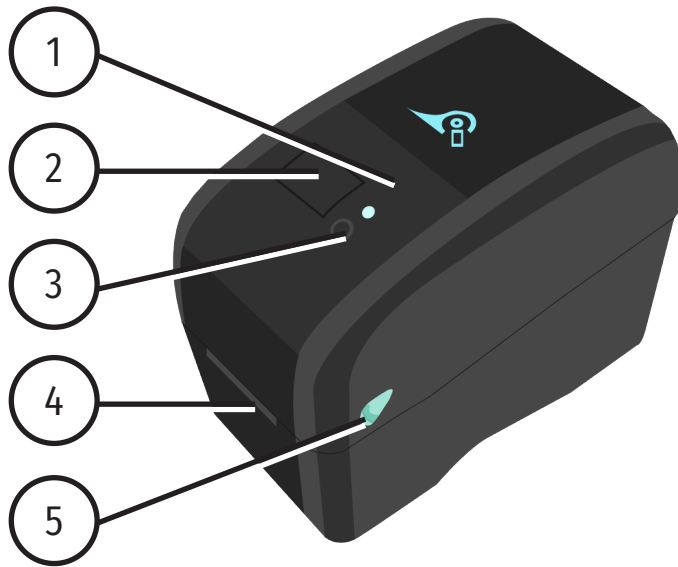
This function is to ensure that correct testing procedures are carried out in accordance with the Standard AS/NZ3760:2010.

\*Optional

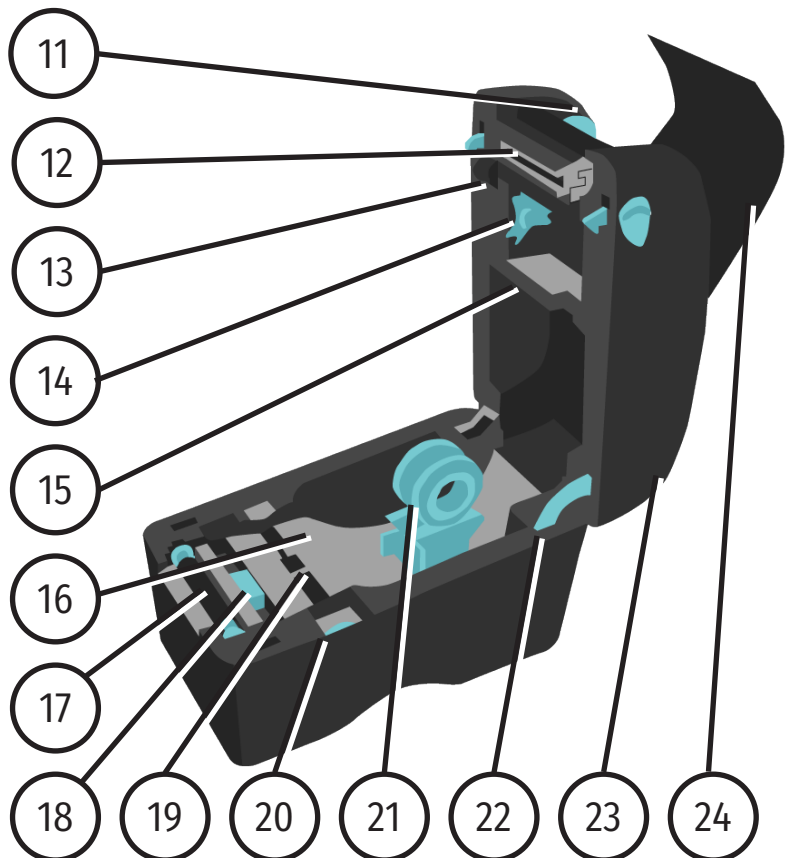
*Note: When using 3-Phase adaptors the NCNT function will need to be over ridden by pressing the 'OK' key prior to the TnP Prime performing the assigned test. Some single-Phase appliances controlled by contactors will also require manual over ride. In some instances, holding the 'ON' button will enable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

# Wavecom Thermal Transfer Printer

Your TnP Prime comes with an integrated Thermal Transfer Printer - the TT-040-50. The TnP Prime printer is ready and fully set up to use out of the box. We can also provide logo artwork for fully customised tags.



- 1. LED Indicator
- 2. Media view window
- 3. Feed Button
- 4. Label Exit Chute
- 5. Top Cover Release Lever
- 6. Power Switch
- 7. Power Socket
- 8. USB Interface
- 9. RS-232C Interface
- 10. SD Card Slot
- 11. Ribbon Rewind Hub
- 12. Print Head
- 13. Ribbon Rewind Gear
- 14. Ribbon Supply Hub
- 15. Gap Sensor (Receiver)
- 16. Gap Sensor (Transmitter)
- 17. Platen Roller
- 18. Black Mark Sensor
- 19. Media Guide
- 20. Media Guide Adjuster Knob
- 21. Media Holders
- 22. Top Cover Hinge
- 23. Top Cover
- 24. Ribbon Access Cover

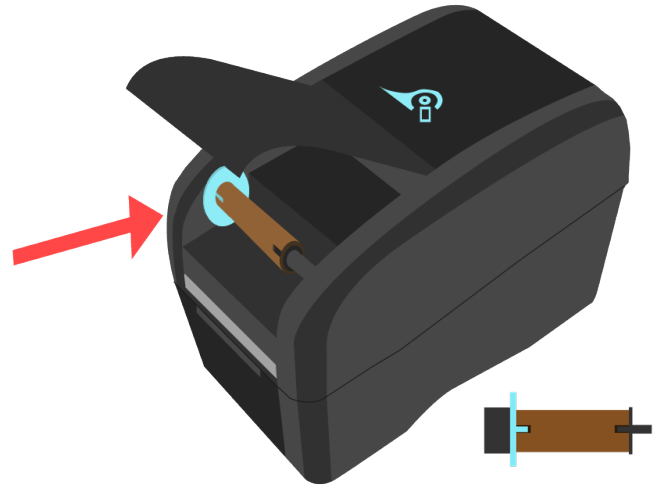


## Loading the Ribbon

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



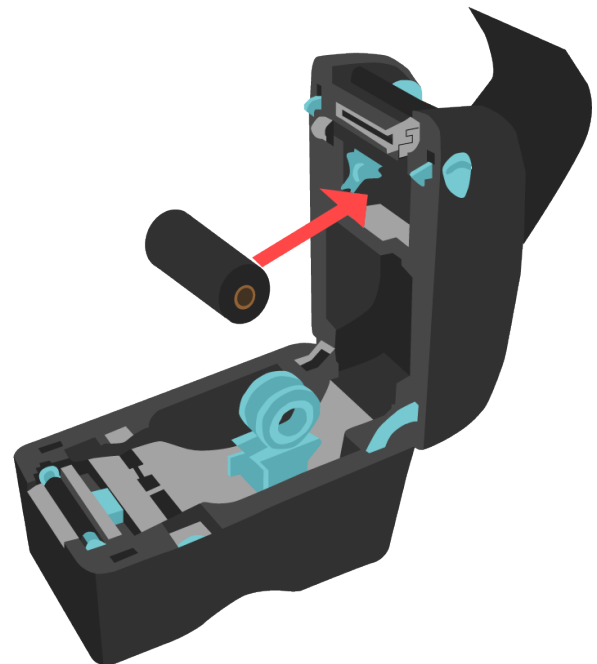
1. Open the top cover of your Printer



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

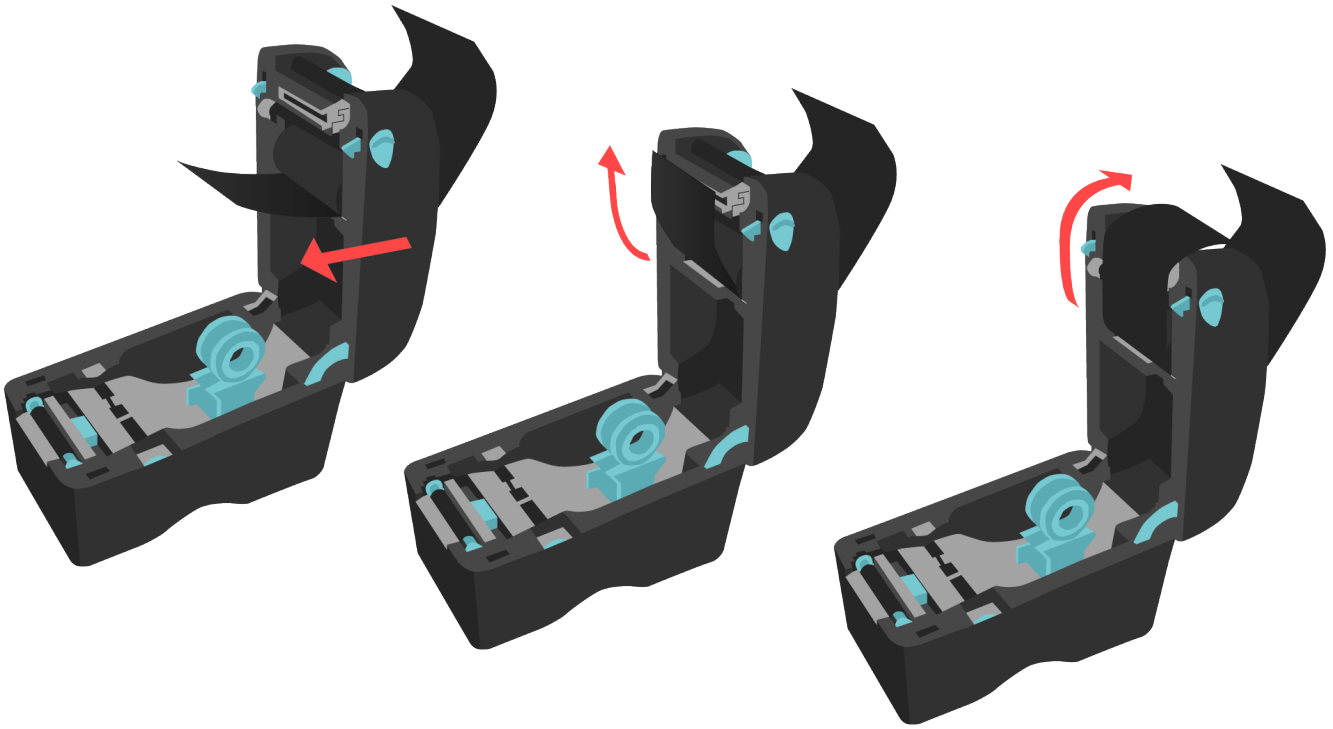


3. Open the printer. and get the thermal transfer ribbon ready. Ensure the ribbon unwinds from underneath as shown in Step 5

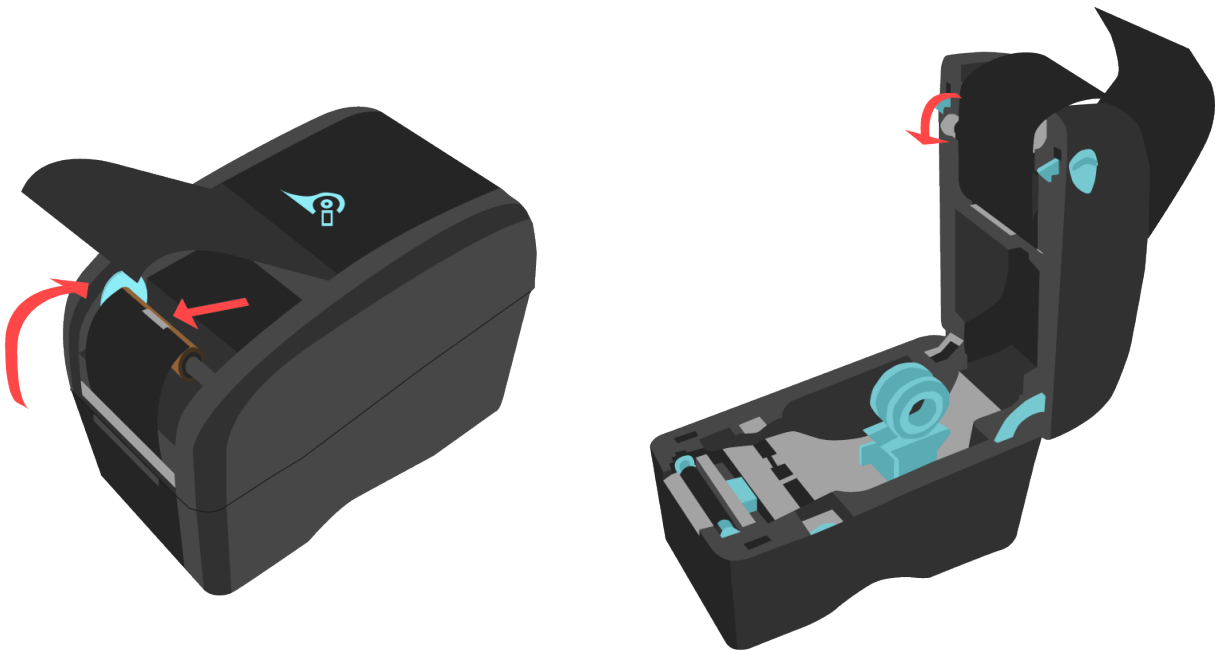


4. Push the ribbon into the right axle (black), then align the notches on the left and insert the ribbon onto the gear (blue)





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

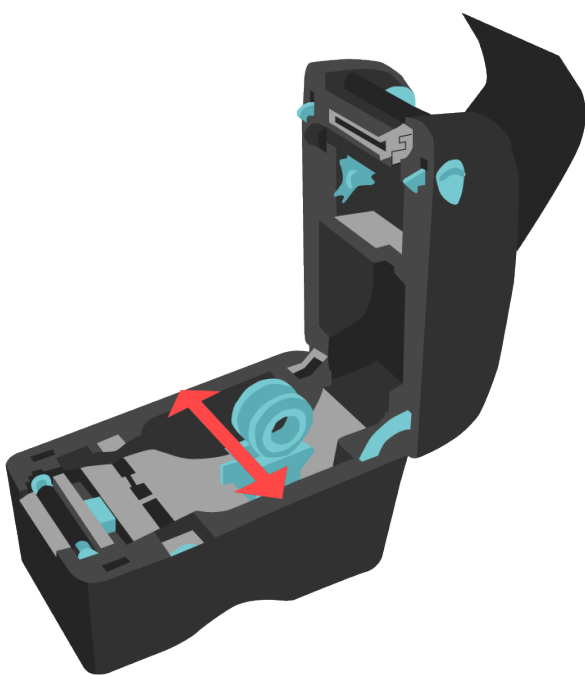


6. Attach the ribbon to the empty roll using a piece of tape - try to attach the ribbon as straight as possible.

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

## Loading the media

Loading media into the TT-040-50 Printer is quick and easy. To begin, open the printer top cover by pulling the tabs located on each side towards the front of the printer, and then lift the top cover to the maximum open angle.



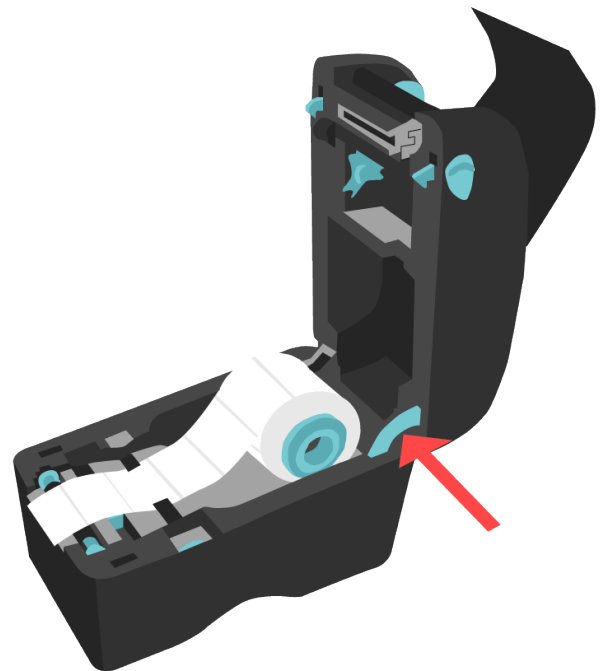
1. Separate the Label Holders by gently pulling them in opposite directions



2. Insert the media between the label holders as shown



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



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

## LED and Button Functions

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

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

### Regular Button Function

#### Feed labels

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

#### Pause the printing job

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

### Power on Utilities

There are six power-on utilities to set up and test printer hardware.

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

Functions	LED Colour & Action						
	Amber	Red (5 Flashes)	Amber (5 Flashes)	Green (5 Flashes)	Green/ Amber (5 Flashes)	Red/ Amber (5 Flashes)	Solid Green
Gap/Black Mark Sensor Calibration		Release					
Gap/Black Mark Sensor Calibration, Self Test and Enter Dump Mode			Release				
Printer Initialisation				Release			
Set Black Mark Sensor as Media Sensor and Calibrate the Black Mark Sensor					Release		
Set Gap Sensor as Media Sensor and Calibrate the Gap Sensor						Release	
Skip AUTO.BAS							Release

## Gap/Black Mark Sensor Calibration

Gap/black mark sensor sensitivity should be calibrated in the following circumstances:

1. A brand new printer
2. Change label stock
3. Printer initialization

### **Please follow the steps below to calibrate the gap/black mark sensor.**

1. Turn off the power switch.
2. Hold on the button then turn on the power switch.
3. Release the button when LED becomes red and flashing. (Any red will do during the 5 flashes).
4. It will calibrate the gap/black mark sensor sensitivity.
  - The LED colour will be changed as following order:
    1. Amber
    2. Red (5 flashes)
    3. Amber (5 flashes)
    4. Green (5 flashes)
    5. Green/amber (5 flashes)
    6. Red/amber (5 flashes)
    7. Solid green

*Note: Sensor calibration can be done by the power on utility.*

*Note: Please select gap or black mark sensor type prior to calibrate the sensor.*

## Gap/Black Mark Calibration, Self-test and Dump Mode

While calibrating the gap/black mark sensor, printer will measure the label length, print the internal configuration (self-test) on label and then enter the dump mode. To calibrate gap or black mark sensor depends on the sensor setting in the last print job.

### **Please follow the steps below to calibrate the sensor.**

1. Turn off the power switch.
2. Hold on the button then turn on the power switch.
3. Release the button when LED becomes amber and flashing. (Any amber will do during the 5 flashes)
  - The LED colour will be changed as following order:
    1. Amber
    2. Red (5 flashes)
    3. Amber (5 flashes)
    4. Green (5 flashes)
    5. Green/amber (5 flashes)
    6. Red/amber (5 flashes)
    7. Solid green
4. The printer will calibrate the sensor and measure the label length and then print the internal settings. Then it enter Dump Mode.

*Note: Sensor calibration can be done by power on utility.*

*Note: Please select gap or black mark sensor type prior to calibrate the sensor.*

## 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. Dump mode requires 2" wide paper width.

### Note:

1. Turn off / on the power to resume printer for normal printing.
2. Press FEED button to go 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 flashes. (Any green will do during the 5 flashes).
  - The LED colour will be changed as following:
    1. Amber
    2. Red (5 flashes)
    3. Amber (5 flashes)
    4. Green (5 flashes)
    5. Green/amber (5 flashes)
    6. Red/amber (5 flashes)
    7. 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 Dimensions	2" (50.8 mm) x 2" (50.8 mm)
Sensor Type	Gap sensor
Gap Setting	0.12" (3.0 mm)
Print Direction	0
Reference Point	0,0 (top left corner)
Offset	0

Parameter	Default setting
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

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 flashes. (Any green/amber will do during the 5 flashes).
  - The LED colour will be changed as following:
    1. Amber
    2. Red (5 flashes)
    3. Amber (5 flashes)
    4. Green (5 flashes)
    5. Green/amber (5 flashes)
    6. Red/amber (5 flashes)
    7. Solid green

## Set Gap Sensor as Media Sensor and Calibrate the Gap Sensor

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 flashes. (Any red/amber will do during the 5 flashes).
  - The LED colour will be changed as following:
    1. Amber
    2. Red (5 flashes)
    3. Amber (5 flashes)
    4. Green (5 flashes)
    5. Green/amber (5 flashes)
    6. Red/amber (5 flashes)
    7. 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 / Colour	Printer Status	Possible Cause	Recovery Procedure
OFF	No response	No power	<ul style="list-style-type: none"> <li>* Turn on the power switch.</li> <li>* Check if the green LED is lit on power supply. If it is not lit on, power supply is broken.</li> <li>* 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.</li> </ul>
Solid Green	ON	The printer is ready to use	* No action necessary.
Flashing Green	Pause	The printer is paused	* Press the FEED button to resume for printing.
Flashing Red	Error	The out of labels or the printer setting is not correct	<ol style="list-style-type: none"> <li><b>1. Out of labels</b> - Load a roll of label and follow the instructions in loading the media then press the FEED button to resume for printing.</li> <li><b>2. Printer setting is not correct</b> - Initialise the printer by instructions in "Power on Utility".</li> </ol>

## Print Problems

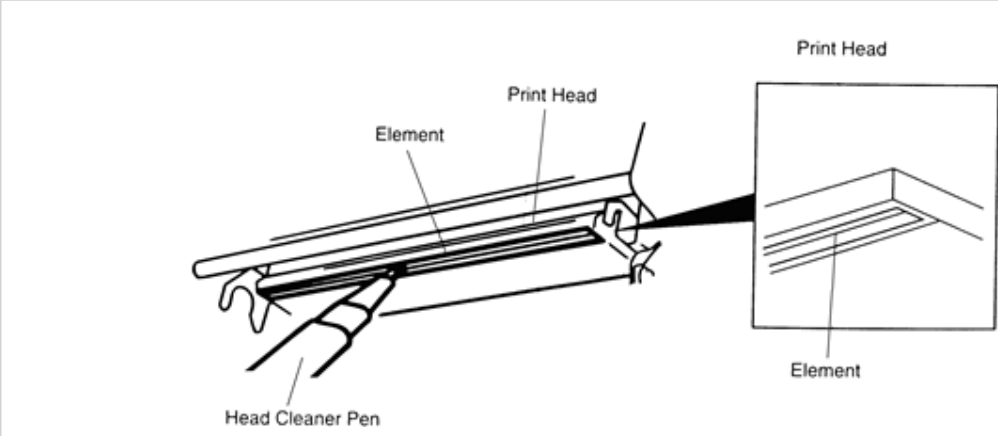
Problem	Possible Cause	Recovery Procedure
<b>Not Printing</b>	Check if interface cable is well connected to the interface connector.	Re-connect cable to interface.
	The serial port cable pin configuration is not pin to pin connected.	Please replace the cable with pin to pin connected.
	The serial port 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.
<b>No print on the label</b>	Label loaded not correctly.	Follow the instructions in loading the media.
<b>Continuous feeding labels</b>	The printer setting may go wrong.	Please do the initialization and gap/black mark calibration.
	Gap/black mark sensor sensitivity is not set properly (sensor sensitivity is not enough)	Calibrate the gap/black mark sensor.
<b>Paper Jam</b>	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.
	Top cover is not closed properly.	Close the top cover completely and make sure the right side and left side levers are latched properly.
<b>Poor Print Quality</b>	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.

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

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

Printer Part	Method	Interval
Print Head	<ol style="list-style-type: none"> <li>1. Always turn off the printer before cleaning the print head.</li> <li>2. Allow the print head to cool for a minimum of one minute.</li> <li>3. Use a cotton swab and 100% ethanol to clean the print head surface.</li> </ol>	Clean the print head when changing a new label roll
		
Platen Roller	<ol style="list-style-type: none"> <li>1. Turn the power off.</li> <li>2. Rotate the platen roller and wipe it thoroughly with 100% ethanol and a cotton swab, or lint-free cloth.</li> </ol>	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% Ethanol. 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.



# Wavecom Tags & Ribbons

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

## Wavecom Printable Tags

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

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

### Order Information:

Standard Tags (500 Tags per Roll)

Part no: WCM-TAG-(W, R, BL, G, O, Y, BR) - eg. WCM-TAG-W

UV Tags (400 Tags per Roll)

Part no: WCM-UV-TAG-(W, R, BL, G, O, Y, BR) eg. WCM-UV-TAG-W

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

## Wavecom Printing Ribbon

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

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

### Order information:

Standard Ribbon

Part no: WCM-RIBBON

UV Ribbon

Part no: WCM-UV-RIBBON

## ***Laminated Overlays***

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

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

### **Order information:**

Clear Laminated Overlays (1000 per Roll)

Part no: WCM-TAG-ALL-Clear-LAM

# Other Information

## Optional Accessories

500mm Metal Braid for Earthing Appliances	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
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 TnP Prime 20A Models 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](http://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.

No part of this document may be Reproduced, Copied, Modified or Utilised in any way or form without the permission of Wavecom Instruments in writing. Wavecom Tags & Ribbons.



Tester Serial Number



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

## Purchase Information

Date of Purchase

Sold By



The TnP Prime 20A is proudly designed and  
manufactured in Australia by Wavecom.

### Wavecom SA

257 Grange Road,  
Findon SA, 5023

P: 08 8243 3500  
F: 08 8243 3501  
E: [service@wavecom.com.au](mailto:service@wavecom.com.au)

### Wavecom WA

Unit 2/17 Casino Street,  
Welshpool WA, 6106

P: 08 9353 1943  
F: 08 9353 4319  
E: [saleswa@wavecom.com.au](mailto:saleswa@wavecom.com.au)

### Wavecom VIC

Asian Pacific Offices 18-19, Suite 8,  
79-83 High Street, Kew VIC, 2102

P: 03 9897 4711  
F: 08 8243 3501  
E: [service@wavecom.com.au](mailto:service@wavecom.com.au)