T14 + Li-Ion User Manual

Version 260623

Introduction

This newly developed **T14** Advanced Battery tester is designed to operate on 6V, 8V, 12V and 24V systems and is able to perform the following tests:

1. Battery Tests: Analyses and tests 6V, 8V,12V normal batteries and 12V Starter Li-Ion batteries using advanced microprocessor-controlled testing method which takes about 8 seconds to obtain the test results without draining power.

2. Starter Test: Checks the cranking effectiveness of 6V, 8V, 12V and 24V batteries to predict when the battery will fail to crank a vehicle.

3. Alternator Test: This test checks the alternator's condition by testing it under different loads and performing a diode ripple test on 6V, 8V, 12V and 24V vehicle systems.

4. Grounding Test: Analyses the condition of the electrical return circuit [Chassis Ground] on 6V, 8V and 12V vehicle systems.

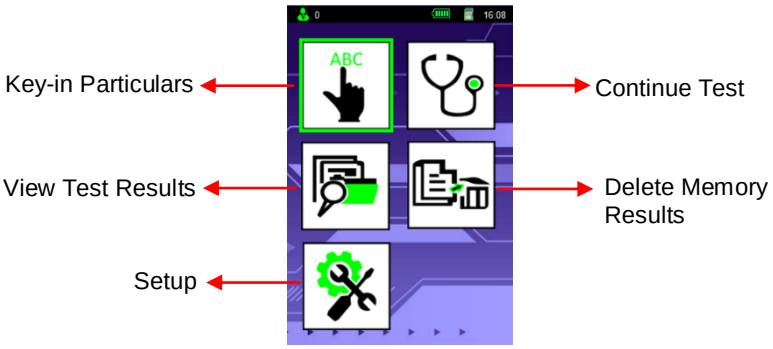
Front panel indications:

Switching ON the unit

There are two ways that **T14** unit can be switched ON:

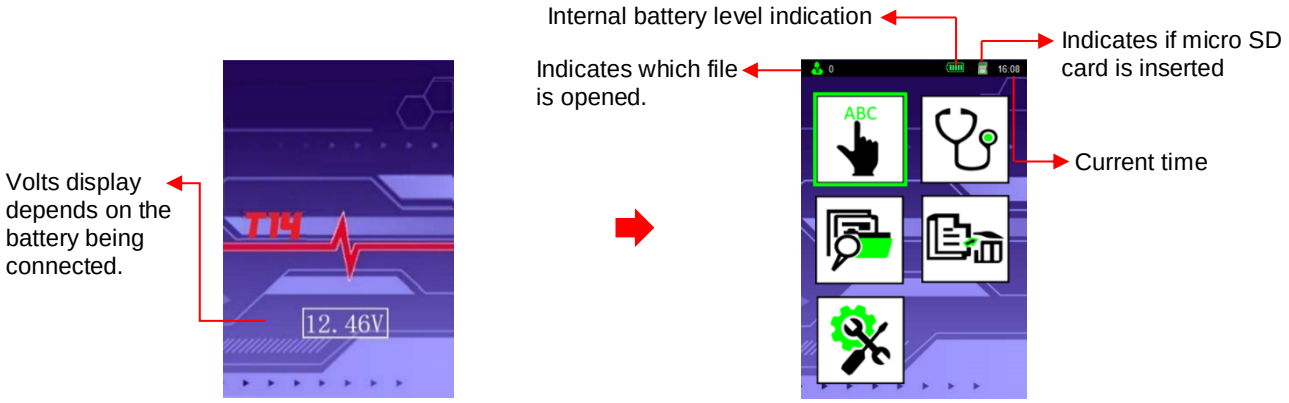
1. Press and hold the  key for a moment, the LCD will light up with the wakeup screen display. This function allows quick access to the main menu screen as shown below for selection of various modes like [**Enter Particulars** before Test], [**Continue Tests**], [**View Previous Test Results**], [**Delete Memory Results**], [**Setup**] and **Printout** of previous test results from the saved memory files without having to be connected to an external 12V battery source. If it is connected to the testing battery while conducting tests, then it will switch to the external battery source mode to conserve its internal battery power.

Wakeup Screen



Main menu Screen

2. Once the red test clip is clamped to the positive (+) terminal and the black test clip is clamped to the negative terminal (-) of an external battery (6V, 8V, 12V or 24V), it will turn ON the Tester. Then it displays the battery voltage and can proceed to the Home menu screen once the Enter ↵ key is pressed.



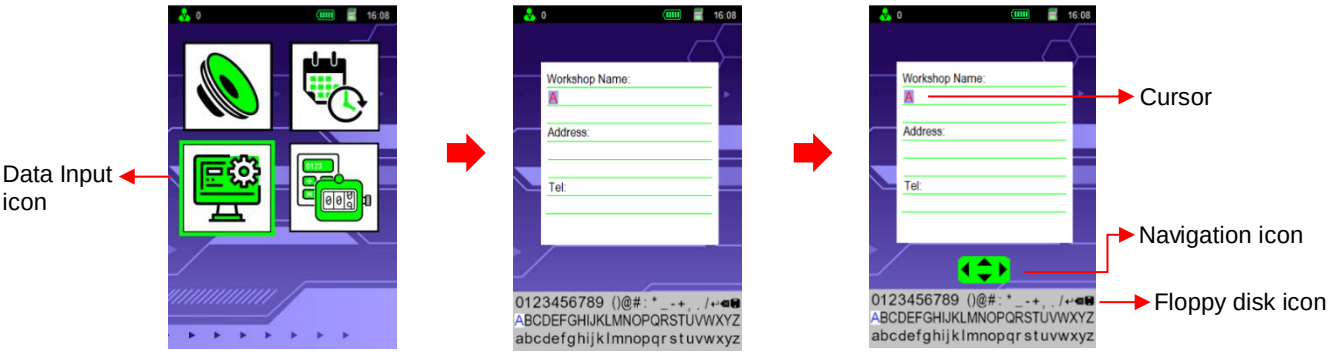
Wakeup Screen

Home menu Screen

Initial Setup

1. To enter Workshop information, select the [**Setting**] icon then press Enter [↵] key and then choose Data Input icon. Once in this mode the workshop name, address and telephone number can be entered using its virtual keyboard.

Home menu Screen



Use the directional keys to select [Data Input] icon and then press Enter [↵] key.

Use the directional keys to input the required alphabet or number from the virtual keyboard.

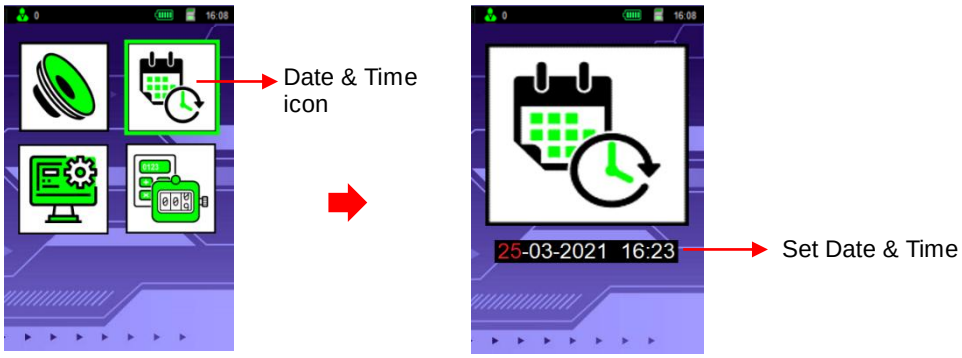
When moving cursor between rows, select the ' ↵ ' symbol from the virtual keyboard and press Enter [↵] key to confirm.

Then the 'Navigation' icon appears, use the direction keys to move cursor between rows.

Once the row is selected, press Enter [↵] key again will release the function to permit alphabet or number input.

To save the all keyed-in information, select "Floppy Disk" icon from the virtual keyboard and then press Enter [↵] key to confirm. This information [Workshop name, Address, etc.] will appear together with the Test results after print out.

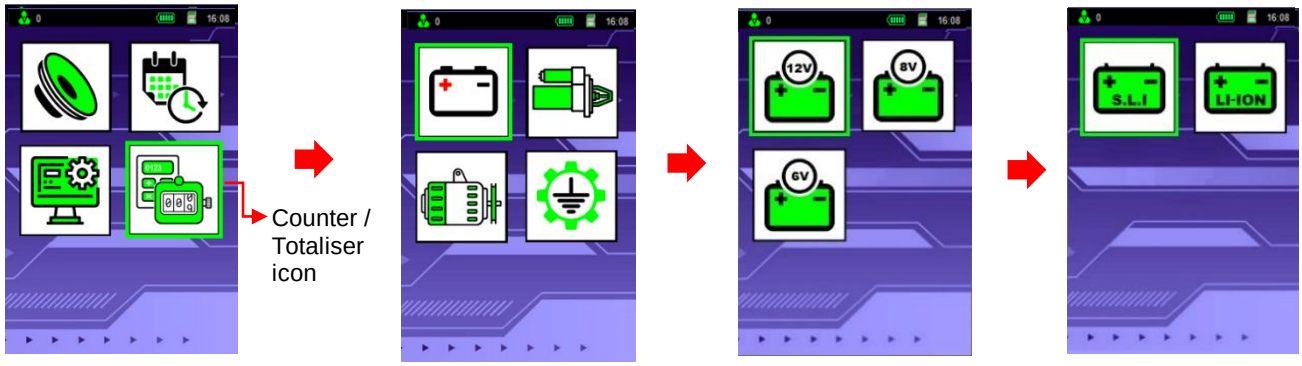
2. To change the **Date & Time**, select [Setting] mode and choose [Date & Time] icon.



Use the directional keys to select [Date & Time] icon and then press Enter [↵] key.

Use the directional keys to select and increase or decrease the values of [Date & Time]. Then press Enter [↵] key to confirm.

3. When [**Counter / Totaliser**] mode had been selected, the number of tests conducted with Battery, Starter, Alternator and Ground Tests will be recorded at the Counter displays which can be reset to zero if needed while the Totaliser displays below it cannot be reset.

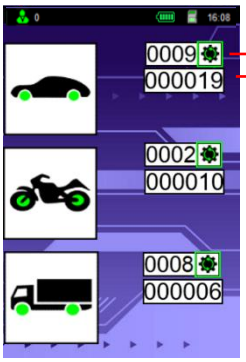


Use the directional keys to select [Counter / Totaliser] icon and then press Enter [↵] key.

Use the directional keys to select [Battery] icon and then press Enter [↵] key.

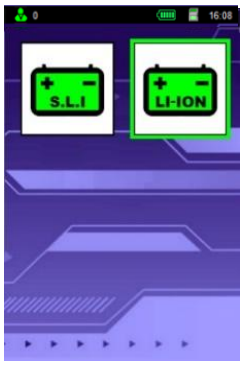
Select [6V, 8V or 12V Battery] icon and then press Enter [↵] key.

Select [Standard Battery] icon and then press Enter [↵] key.

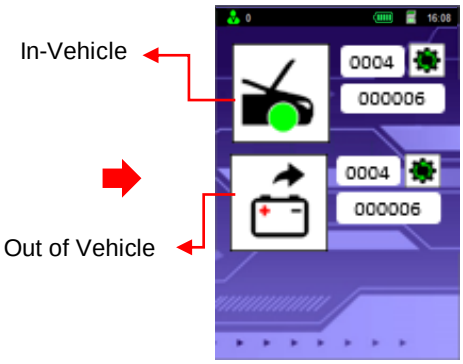


Use the ▲or ▼ keys to select vehicle type and then press Enter [↵] key to reset Counter to zero.

OR

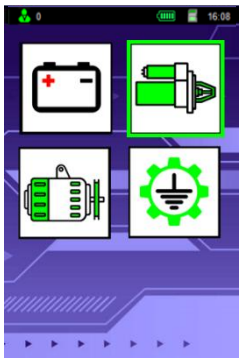


Select [Li-Ion Battery] icon and then press Enter [↵] key.

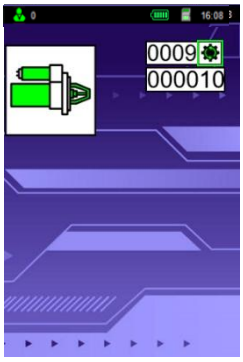


Press Enter [↵] key to reset Counter to zero.

Starter Test

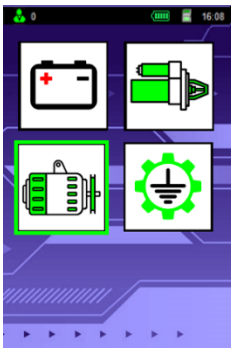


Use the directional keys to select [Starter] icon and then press Enter [↵] key.

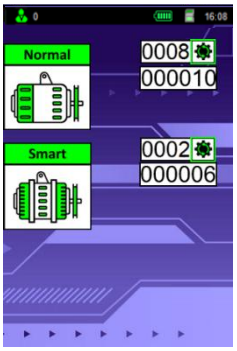


Press Enter [↵] key to reset Counter to zero.

Alternator Test

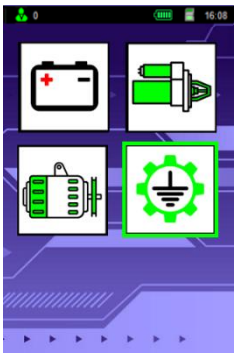


Use the directional keys to select [Alternator] icon and then press Enter [↵] key.

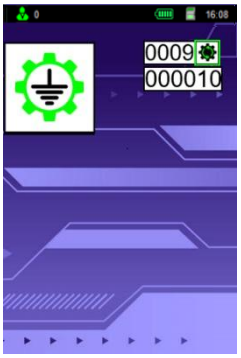


Use the ▲ or ▼ keys to select vehicle type and then press Enter [↵] key to reset Counter to zero.

Grounding Test

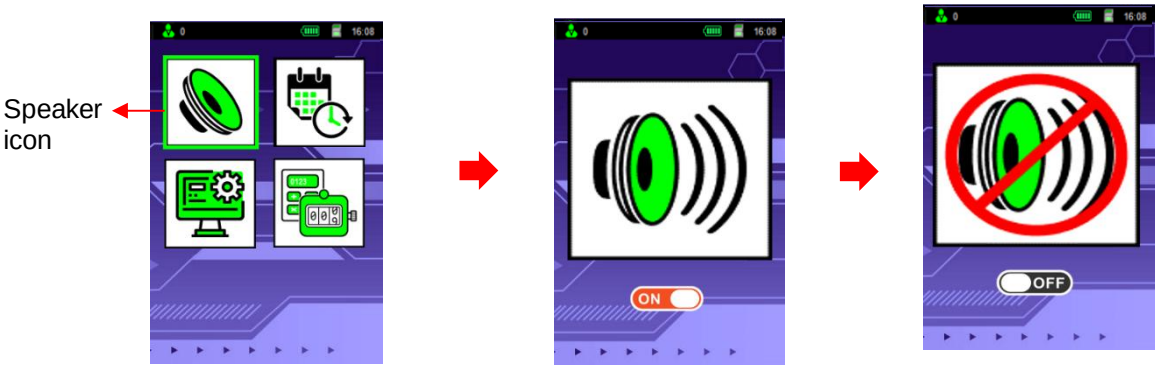


Use the directional keys to select [Grounding] icon and then press Enter [↵] key.



Press Enter [↵] key to reset Counter to zero.

4. To turn the **Beeper** sound ON or OFF, select the Settings mode and choose [Speaker] icon.

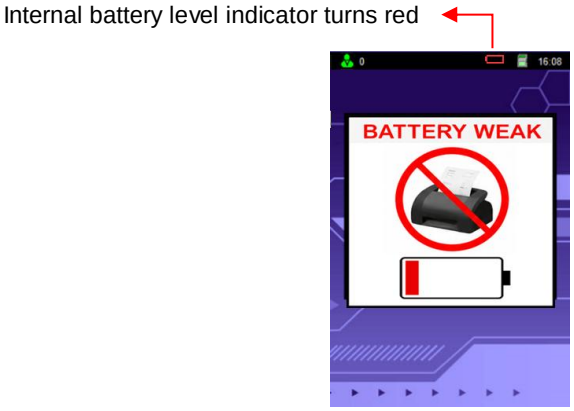


Use the directional keys to select [Speaker] icon and then press Enter [↵] key.

Use the ◀ key to turn sound OFF and ▶ key to turn ON. Press Enter [↵] key to confirm and exit to menu.

Low internal battery power warning

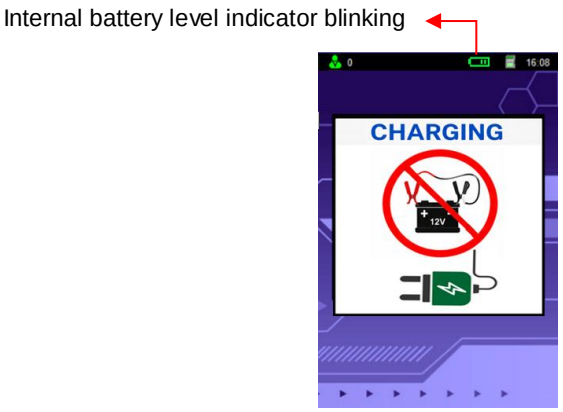
A warning message will pop up in the display when the Tester has detected that its internal battery power has run low especially during printout as shown below:



When encountering the above situation, just plug in the 5V Li-Ion battery charger (supplied) to the Tester to charge it.

Please note that while charging is in progress, all functions like printout, view previous test results, delete results, etc. can be carried out except conducting battery tests. This is because the charging process will affect the battery test results.

If the battery test is deliberately conducted, then it pops up a warning message as shown below warning that the test cannot be carried out.



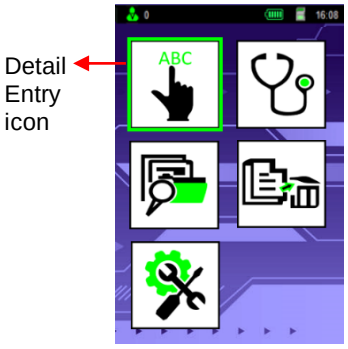
Begin Tests

When a vehicle has been running, its battery will carry a surface charge. In order to correctly test the battery, the surface charge must be removed by turning the headlights ON for 30 seconds with the engine off. Leave the battery at rest with the ignition OFF for at least 60 seconds before testing the battery.

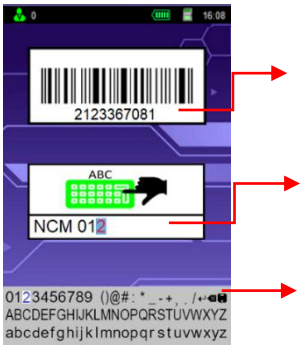
***Note**:*

- *The maximum cranking current for Normal and Li-Ion battery test in Car /Truck mode is 2,000A and Motorcycle mode is 600A.*
- *Motorcycle mode only conducts Battery test only while all other tests are available for Car/Truck and Li-Ion mode.*
- *For a 24V system (12V x 2 batteries) the batteries must be tested separately (individually) one at a time.*

1. To enter the License plate, VIN or Customer number, select the [Detail Entry] symbol in the main menu.

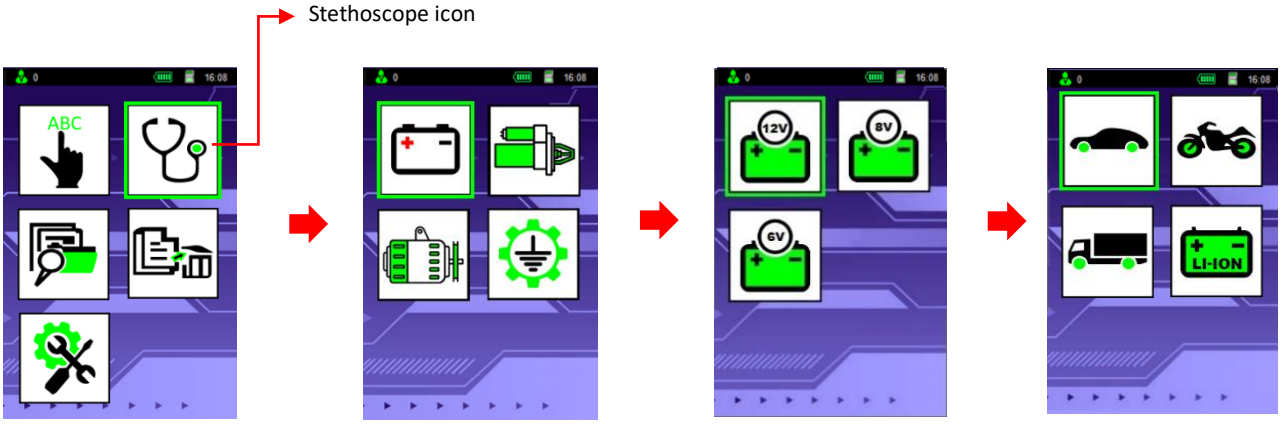


Use the directional keys to select [Detail Entry] icon and then press Enter [↵] key.



Use the directional keys to input the required alphabet or number from the virtual keyboard. To save, move cursor to "Disk" symbol in the virtual keyboard and then press Enter [↵] key to confirm. It will exit to Test menu.

2. To perform Tests [Battery, Starter, Alternator or Ground] straight away without Details Entry, just select [Stethoscope] icon.

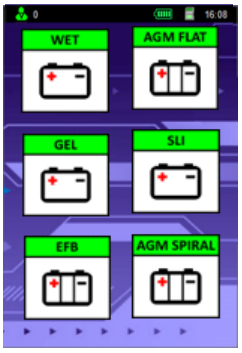


Use the directional keys to select [Stethoscope] icon and then press Enter [↵] key.

Use the directional keys to select Battery icon and then press Enter [↵] key.

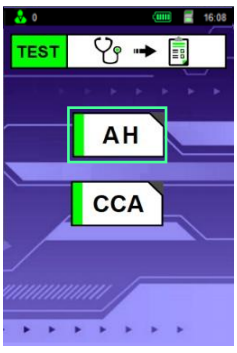
Use the directional keys to select 6V, 8V or 12V battery that is being tested and then press Enter [↵] key.

Use the directional keys to select Car, Motorcycle or Truck and then press Enter [↵] key.



Use the directional keys to select **Battery Type** and then press Enter [↵] key.

Use the directional keys to select **Rating** (CCA, SAE, etc.) and then press Enter [↵] key.



AH battery selected

Input AH Rating value

Testing in progress…

Select Before or After charge

Final Test Results

Test Results in QR code

Weak terminal connections

When the Tester detects the connections to the battery terminals were insufficiently secured to accurately perform a test, it will display the following icons on the screen. Disconnect the tester from the battery, remove dirt and oxide from the terminals with wire brush and then reconnect it back. Repeat the test procedure again.

Checks Battery Voltage before Test:

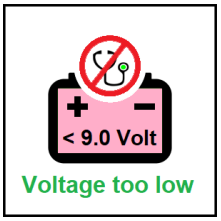
During starting of battery tests, the tester will always check its state of charge (SOC) voltage first. Depending on the battery voltage selection (6V, 8V or 12V) for the following test examples:

Test on 12V Battery selected:

During testing when it detects the voltage is above 15V, it will immediately pop up the [no 24V] sign as shown below. If the voltage is below 12V then it will be displayed as shown below (as a reminder that the battery needs to charge first before test). If the operator insists to proceed with the test, then pressing Enter [↵] key will continue the testing process. The test will not proceed if the battery voltage is below 9.0V as shown below.

This display will show if the battery is 24V. The testing will not continue unless the test is done on 12V battery.

This display will show if the voltage is below 12.0V, press Enter [↵] key if still wants to continue the test.



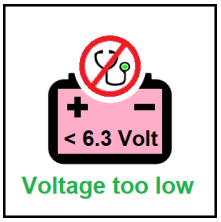
This display shows that voltage is lower than 9.0V. The test will not continue. Recharge the battery first before repeating another test.

Test on 8V Battery selected:

While testing when it detects the voltage is above 10V, it will immediately pop up the [no 12V] sign. If the voltage is below 7.73V then it will be displayed (as a reminder that the battery needs to charge first before test) and if the operator still wants to continue testing, press Enter [↵] key will continue the testing process. The test will not proceed if the voltage is below 6.30V as shown below.

This display will show if the battery is 12V. The testing will not continue unless the test is done on 8V battery.

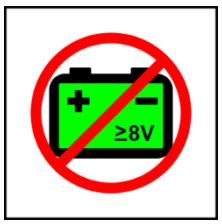
This display will show if the voltage is below 7.73V, press Enter [↵] key if still wants to continue the test.



This display shows that voltage is lower than 6.30V. The test will not continue. Recharge the battery first before repeating another test.

Test on 6V Battery selected:

While testing, when it detects the voltage is above 8.0V it will immediately pop up the [more than 8V] sign as shown below. If the voltage is below 5.90V then it will be displayed (as a reminder that the battery needs to charge first before test) and if the operator still wants to continue testing, press Enter [↵] key will continue the testing process.

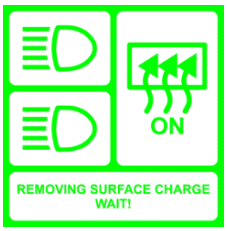


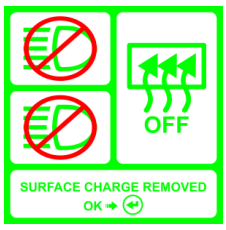
This display will show if the battery is more than 8.0V. The testing will not continue unless the test is done on 6V battery.

This display will show if the voltage is below 5.90V, press Enter [↵] key if still wants to continue the test.

Presence of Surface Charge

If the Tester detects the presence of surface charge in the battery, the display screen message [Removing Surface Charge. Wait!] will pop up. Following the procedures as shown in the graphics. Once completed, proceed with the Battery test.





The display will show when the Surface Charge has been removed.

STEP 1. Turn ignition key to ON position.

STEP 2. Switch ON Low and High Beams.

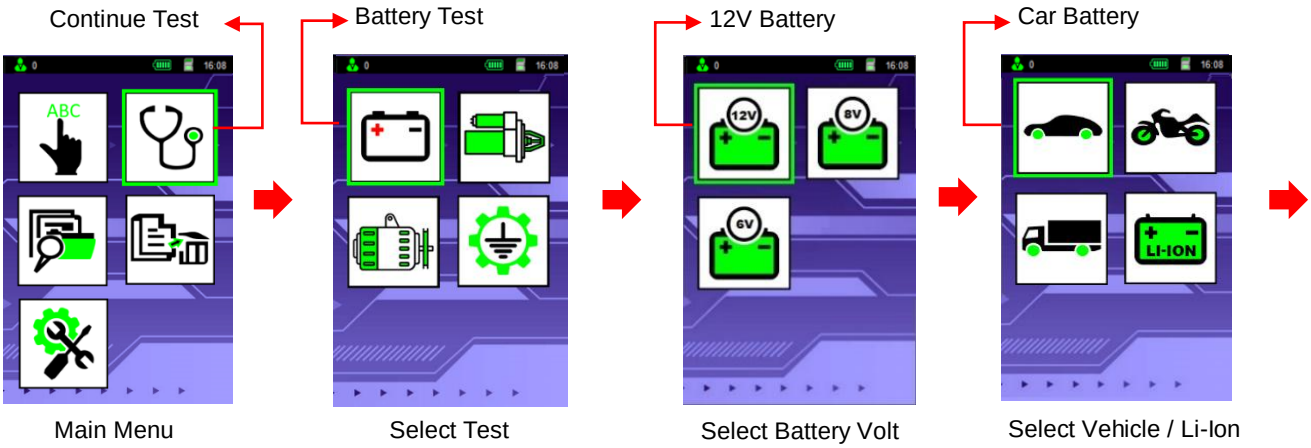
STEP 3. Switch ON Heater or Demister

STEP 4. Then, switch OFF Low and High Beams and Heater or Demister

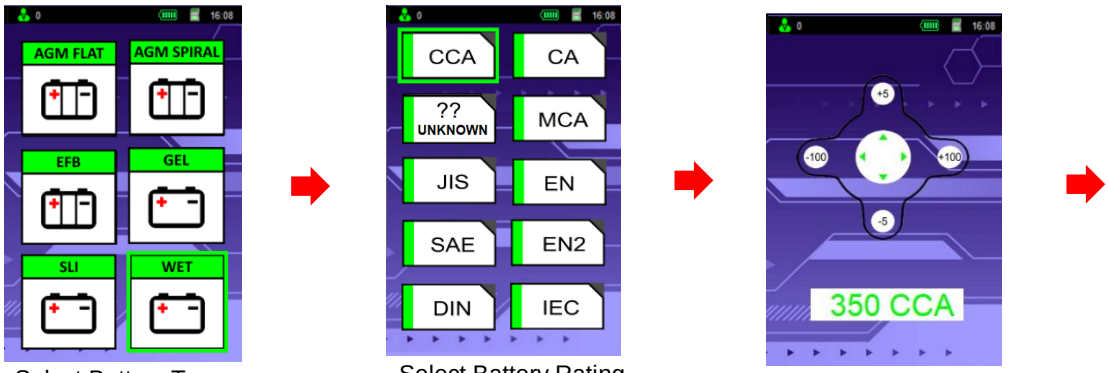
STEP 5. Turn ignition key to OFF position and then press Enter [↵] key to continue.

Normal Battery Test – 6V, 8V and 12V

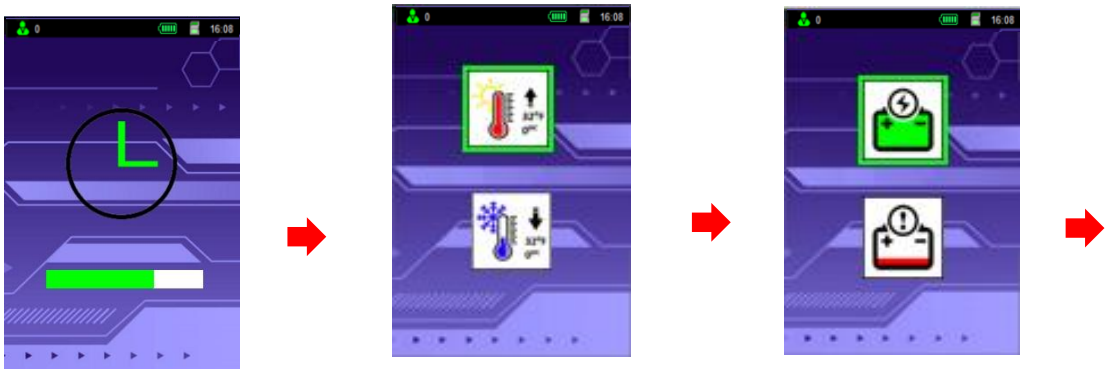
1. Before performing this test make sure the vehicle's transmission is in NEUTRAL mode or PARK position (Auto Transmission) and with the parking brake applied. With the engine OFF, connect the tester clamps to the battery terminals. Select [Battery] icon from test menu to begin test.



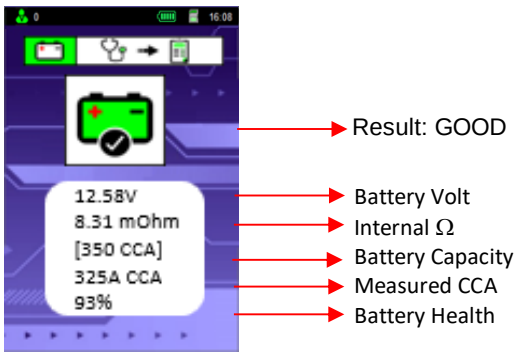
Main Menu | Select Test | Select Battery Volt | Select Vehicle / Li-Ion



Select Battery Type | Select Battery Rating | Key-in CCA capacity



Testing in progress… | Select Temperature | Select Before Charge or After Charge

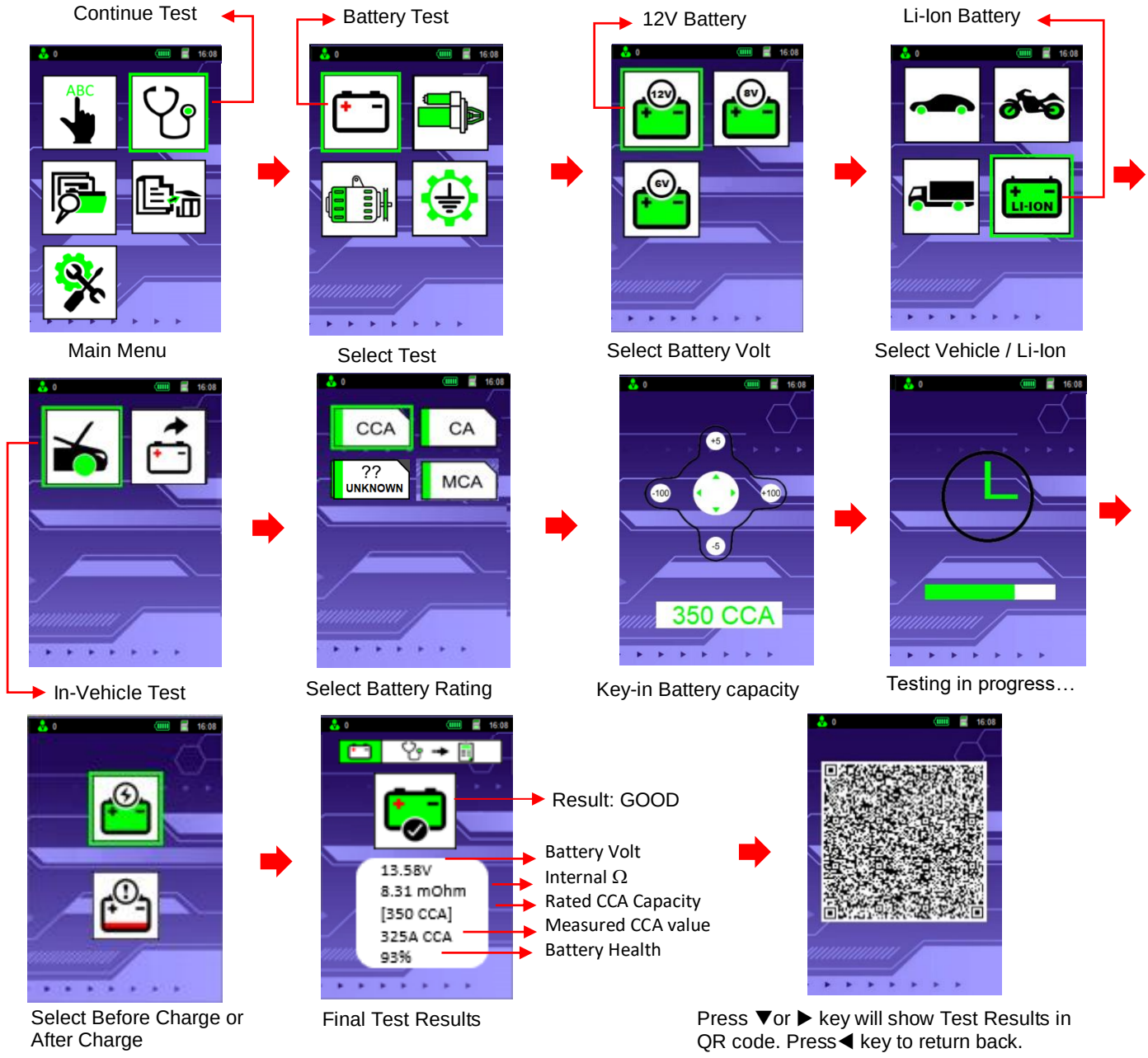


Final Test Results

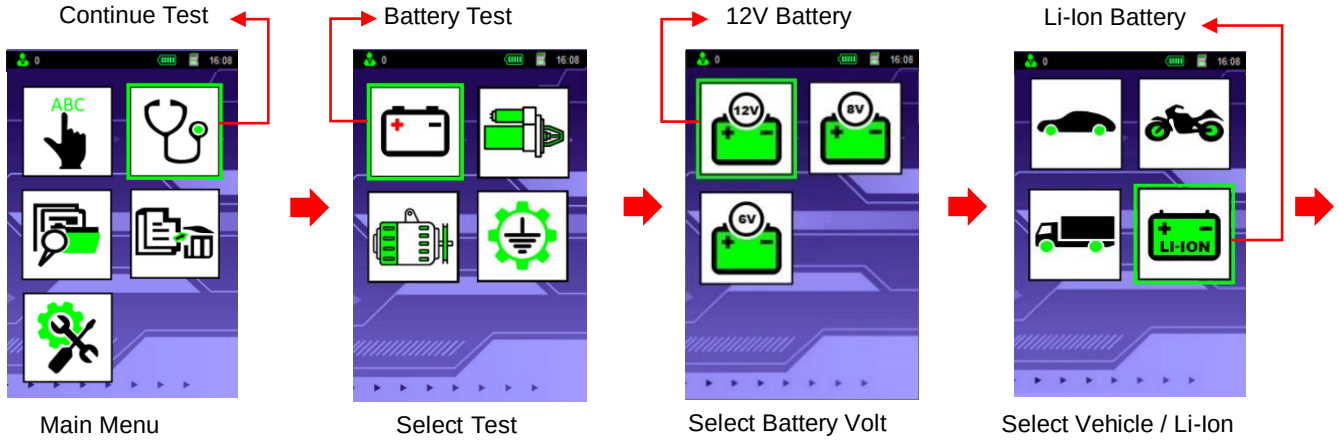
Press ▼or ▶ key will show Test Results in QR code. Press◀ key to return back.

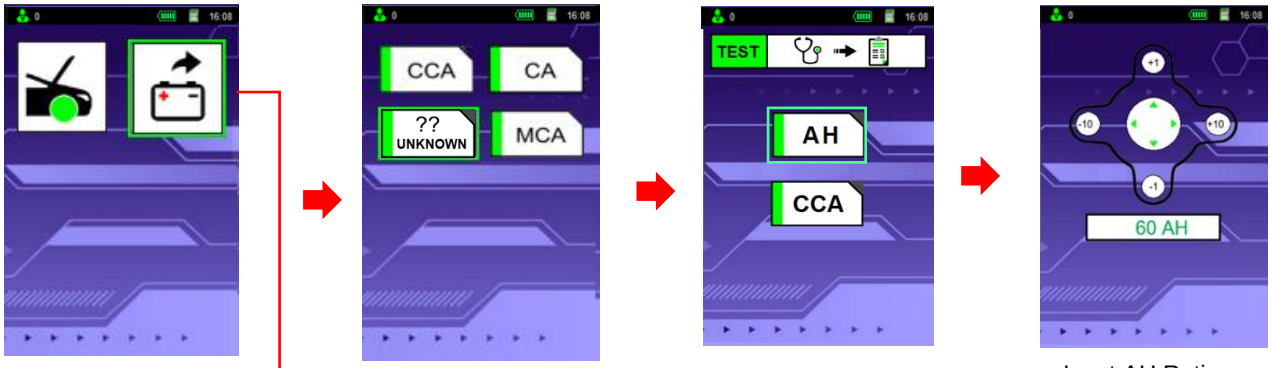
Lithium-Ion Battery Test – 12V (In-Vehicle Test)

1. Before performing this test make sure the vehicle's transmission is in NEUTRAL mode or PARK position (Auto Transmission) and with the parking brake applied. With the engine OFF, connect the tester clamps to the battery terminals. Select [Battery] icon from test menu to begin test.



Lithium-Ion Battery Test – 12V (Out of Vehicle Test) Unknown??



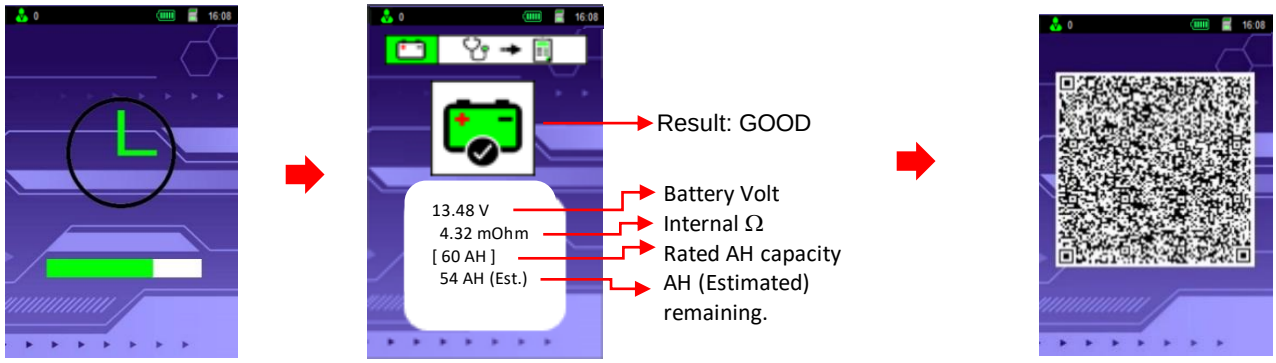


Out of Vehicle Test

Unknown Rating selected

Input AH capacity rating value

Input AH Rating value



Testing in progress…

Final Test Results

Test Results in QR code

Battery Internal Resistance (mOhm)

On average, good batteries have internal resistance ranges between 2 ~ 15 mOhm. Above these values, the battery is considered to be aged or sulphated. Motorcycle batteries may have a higher internal resistance and still be considered good due to their lower CCA values. Always refer to the values given by the battery manufacturer.

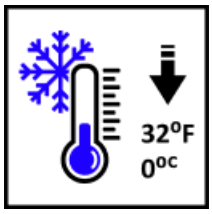
Low state of charge (SOC) Voltage

During testing, if it detects the voltage state of charge (SOC) is below 75%, the display will prompt the following graphic displays before showing the final Test Results.

1. *Surrounding Temperature Selection:*

Green highlighted frame indicates that is selected.

Above 0°C / 32°F

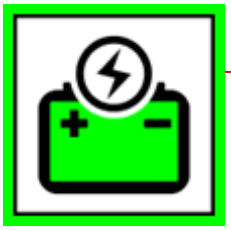


Below 0°C / 32°F

Use the ◀ or ▶ keys to select Temperature and then press Enter [↵] key to continue.

2. *Battery Status Selection:*

Before Charge

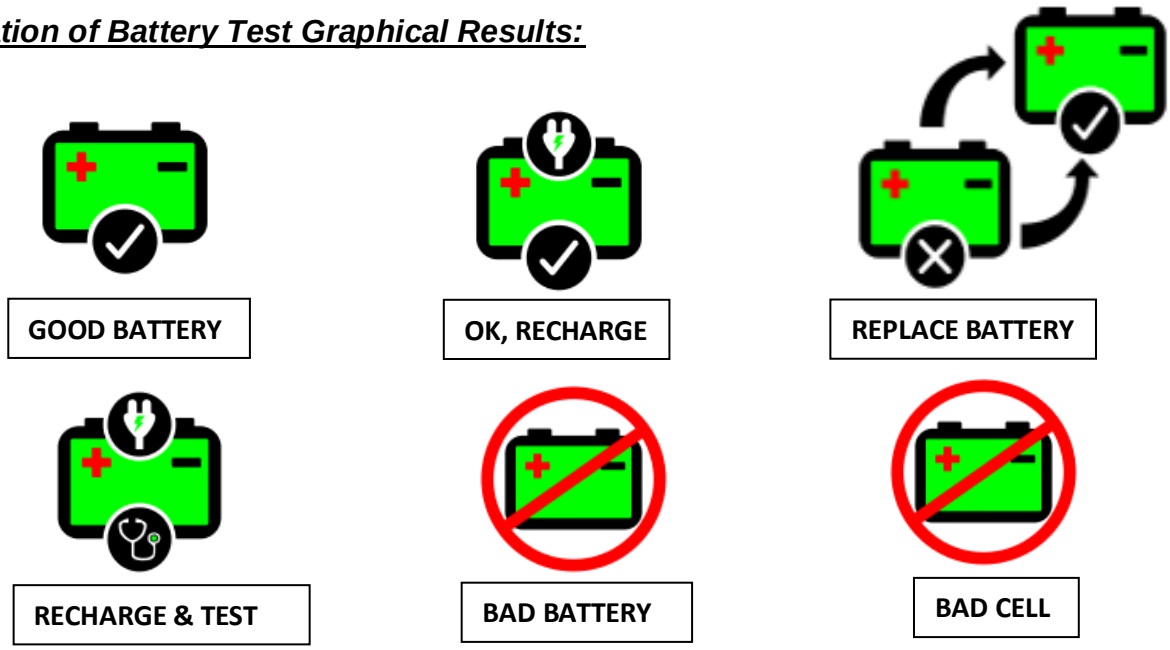


After Charge

Green highlighted frame indicates that is selected.

Use the ◀ or ▶ keys to select Before or After Charge and then press Enter [↵] key to continue.

Interpretation of Battery Test Graphical Results:

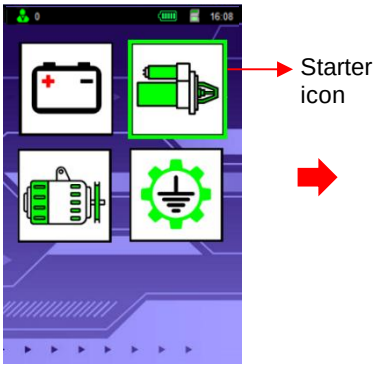


Note: *QR codes can be displayed by pressing ▶ key immediately after the test results shown up. Its purpose is to allow Smart phones to scan it and share the results through the Internet. To return back to the previous display, press ◀ key again.*

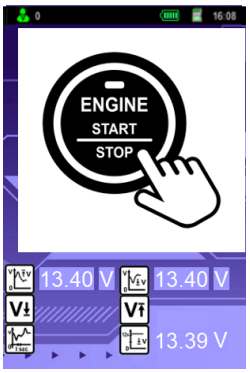
Starter (Cranking) Tests (6V / 8V / 12V & 24V system)

Before performing this test make sure the vehicle's transmission is in NEUTRAL mode or PARK position (Auto Transmission) and with the parking brake applied. Select [Starter] icon from test menu to begin test.

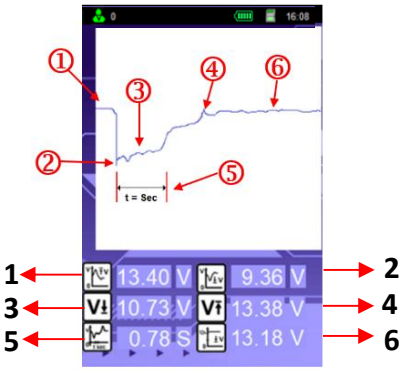
The test algorithm will automatically switch to the battery system according to the voltage it has detected e.g. 12V will test with 12V system algorithm, 24V with 24V system algorithm, etc.



Use directional keys to select Starter icon until it is highlighted, just press Enter [↵] key to continue.



Push Start or turn ignition key to START until engine starts running.



Captured wave form and readings during cranking showing conditions of the battery.

Interpretation of the 12V Starter Test results based on the above example:

1. Maximum Voltage captured during test: **13.40 V**
   Normally the state of charge (SOC) voltage of the battery before cranking the engine.

2. Maximum voltage dipped during cranking: **9.36 V**
   Indicates the maximum voltage dip captured when the Starter begins to turn the engine's flywheel during cranking. (**Note**: Reading this voltage together with Cranking voltage [**3**] and Period (in seconds) [**5**] can tell whether the battery is weak or has aged or if the battery is new then the Starter starts having problem.)

3. Average Cranking Voltage: **10.73 V**
   Indicates the actual average cranking voltage before engine runs. If this voltage dips below **9.6V** for 12V system or below **19.2V** for 24V system that means that the battery is weak and is coming to the end of its operating life.

4. Maximum Recovered Voltage: **13.38 V**
   Indicates the highest climb voltage before going into the charging while the engine is running.

5. Cranking period before engine ignition starts: **0.78S**
   Indicates the period (in seconds) during cranking before the engine starts which determines the condition of the battery. The shorter the cranking time the better the condition of the battery. Weak batteries will take longer time to start the engine.

6. Average Charging voltage: **13.18 V**
   This is the live charging volts measured while engine is running even though the waveform was freeze after cranking. It shows how much charging volts that the alternator produces while engine running.

Note: The above results will tell the full picture on the condition of the starter or battery under actual engine load test so that we can take precaution steps before it fails to start an engine.

Normal or Smart (Intelligent) Alternator Tests (6V / 8V / 12V & 24V system)

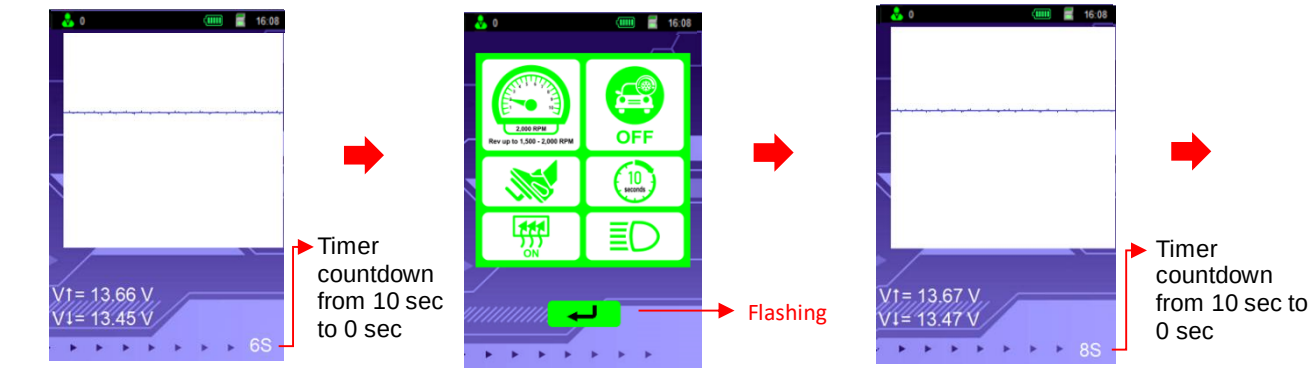
Before performing this test make sure the vehicle's transmission is in NEUTRAL mode or PARK position (Auto Transmission) and with the parking brake applied. Select [Alternator] icon from test menu to begin test.

Its test algorithm will automatically switch to the battery system according to the voltage it has detected e.g. 12V will test with 12V system algorithm, 24V goes with 24V system algorithm, etc.

Use directional keys to select [Alternator] icon until it is highlighted, just press Enter [↵] key to continue.

Use the ◀ or ▶ keys to select [Normal] or [Smart] and then press Enter [↵] key to continue.

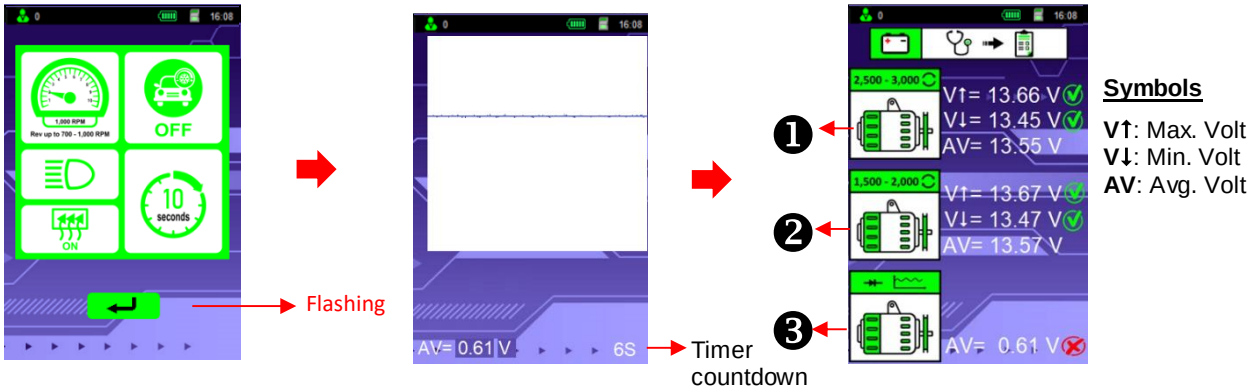
Test with electrical load OFF. Follow the on-screen instructions, and press Enter [↵] to continue.



Charging voltage at 2,500 ~ 3,000 RPM with all electrical loads switch OFF

Test with electrical load ON. Follow the on-screen instructions, and press Enter [↵] to continue.

Charging voltage at 1,500 ~ 2,000 RPM with all electrical loads switch ON



Test AC Ripples with electrical Load. Follow the on-screen instructions, and press Enter [↵] to continue.

Checking the Diode AC ripple at 700 ~ 1,000 RPM with all electrical loads switch ON

Final Tests Results

The final Tests results can be compared with the tables below to indicate the state of the Alternator charging conditions:

1. **Without Electrical Load Test @ (Car: 2,500 ~ 3,000 RPM) or (Trucks: 1,400 ~ 1,800 RPM)**

Without Load	6V Limits	8V Limits	12V Limits		24V Limits	
	Normal	Normal	Normal	Smart	Normal	Smart
V↑	≤ 7.8V	≤ 10.4V	≤ 15.0V	≤ 16.2 V	≤ 30.0V	≤ 32.4V
V↓	≥ 6.2V	≥ 8.2V	≥ 13.3V	≥ 12.4V	≥ 26.6V	≥ 24.8V

2. **With Electrical Load Test @ (Car: 1,500 ~ 2,000 RPM) or (Trucks: 1,200 ~ 1,600 RPM)**

With Load	6V Limits	8V Limits	12V Limits		24V Limits	
	Normal	Normal	Normal	Smart	Normal	Smart
V↑	≥ 7.3V	≥ 9.7V	≥ 13.8V	≥ 12.4V	≥ 27.6V	≥ 24.8V
V↓	≥ 6.2V	≥ 8.2V	≥ 12.6V	≥ 12.0V	≥ 25.2V	≥ 24.0V

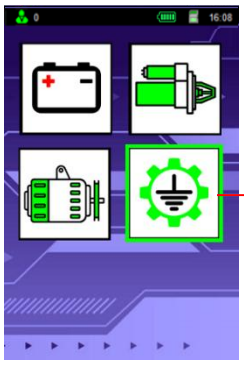
3. **Diode AC Ripple Test with Load (Idling speed: 700 ~ 1,000 RPM)**
   The AC ripple of the alternator is checked to see if it is within less than 0.5V limit. If one of the diodes is faulty, the AC ripple will produce higher than the accepted 0.5V. Indicating that the alternator is not functioning correctly.

Note: *QR codes can be displayed by pressing ▶ key immediately after the test results shown up. Its purpose is to allow Smart phones to scan it and share the results through the Internet.*

To print the results, press the printer symbol on the tester. Pressing the return key will exit the tests.

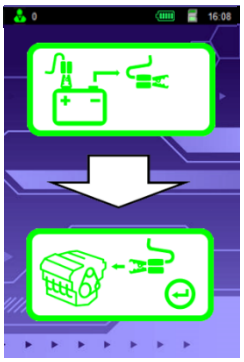
Ground Test (6V / 8V/ 12V system)

Before performing this test make sure the vehicle's transmission is in NEUTRAL mode or PARK position (Auto Transmission) and with the parking brake applied. With the engine OFF, connect the tester clamps to the battery terminals. Select [Ground] icon from test menu to begin test.



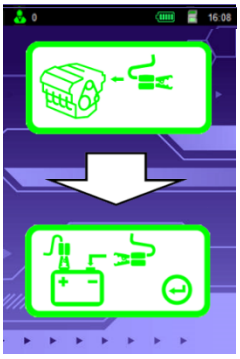
Ground icon

Use directional keys to select [Ground] icon until it is highlighted, just press Enter [↵] key to continue.



Transfer the black (-) clamp from battery and attached to the chassis or engine body. Then press Enter [↵] key to continue.

Testing in progress…



Transfer the black (-) clamp from chassis or engine body back to the battery (-) terminal. Then press Enter [↵] key to continue.

Testing in progress…

Test result shows that the ground connection is good.

OR

Test result shows that the ground connection has high resistance.

OR

Test result shows that the result is inconclusive.

***Note:** QR codes can be displayed by pressing ▶ key immediately after the test results shown up.*

To print the results, press the printer symbol on the tester. Pressing the return key will exit the tests.

View Saved Test Results

To view all the saved test results from the memory, power ON the unit by pressing  and hold for a few seconds. The display screen will light up showing the [Main menu] as seen below. Select [View] icon and press Enter [↵] key to continue.

File [0]

File name appear here

This [View] icon will appear when it has entered into the view test results mode

View icon

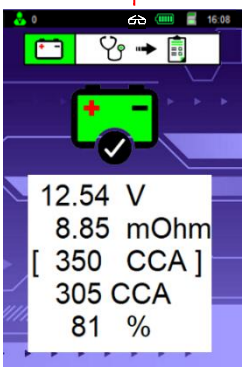
Main Menu

Use directional keys to select [View Files] icon until it is highlighted, just press Enter [↵] key to continue.

Saved test results list

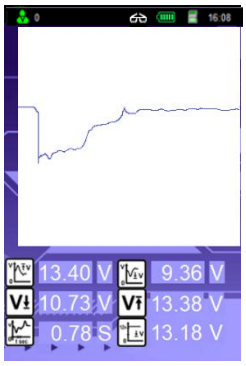
Use ▲ or ▼ key to select. Once you had selected the File [0], its name will also appear at the top left corner.

Indicate page 1/3. Use ◀/▶ to change.



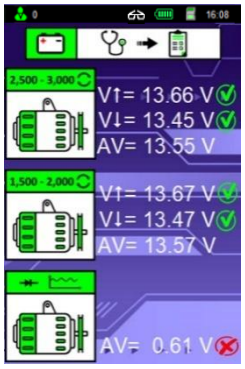
Battery Test Results

OR



Starter Test Results

OR



Alternator Test Results

OR

Ground Test Results

Results in QR codes

To print the results, press the printer symbol on the tester.

Delete Saved Results

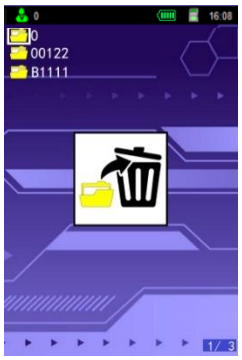
To delete the saved test results from the memory individually, select [Delete Files] icon from the menu display.

Delete icon

Use directional keys to select [Delete Files] icon until it is highlighted, just press Enter [↵] key to continue.

Indicate page 1/3. Use ◀/▶ to change.

Use ▲ or ▼ key to move the highlighted frame to select the file that needs to be deleted. Press Enter [↵] key to continue.



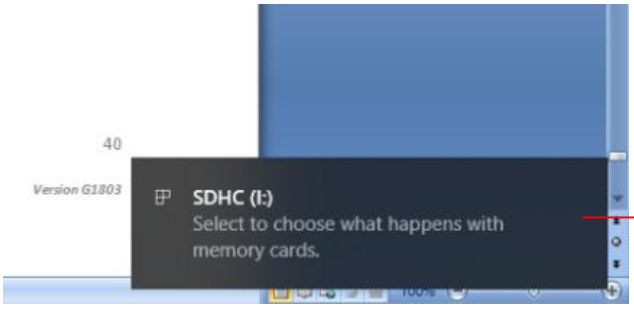
Once confirmed, press Enter [↵] key again will delete the file.

The above showed that the file [0] has been deleted.

Saving all the results from micro SD Card to Personal Computer (PC)

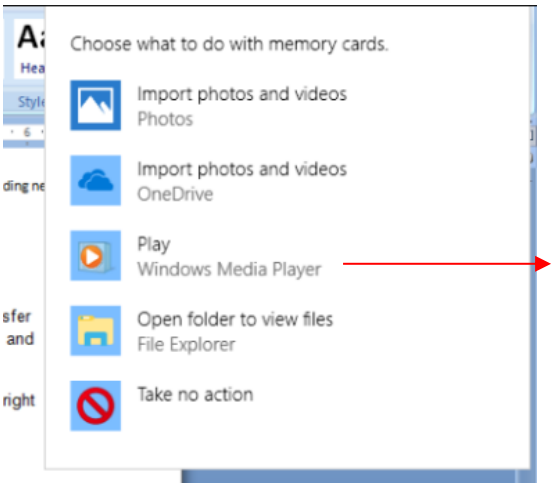
As we know that all the saved Test Results in T14 were being stored in the micro SD Card. To transfer all these saved results into the PC, we need to remove the card from the T14 – micro SD slot and then plugged it into the PC – micro SD card slot.

Once the PC had detected the micro SD card, a pop-up message will appear on the bottom right hand corner of the computer screen.



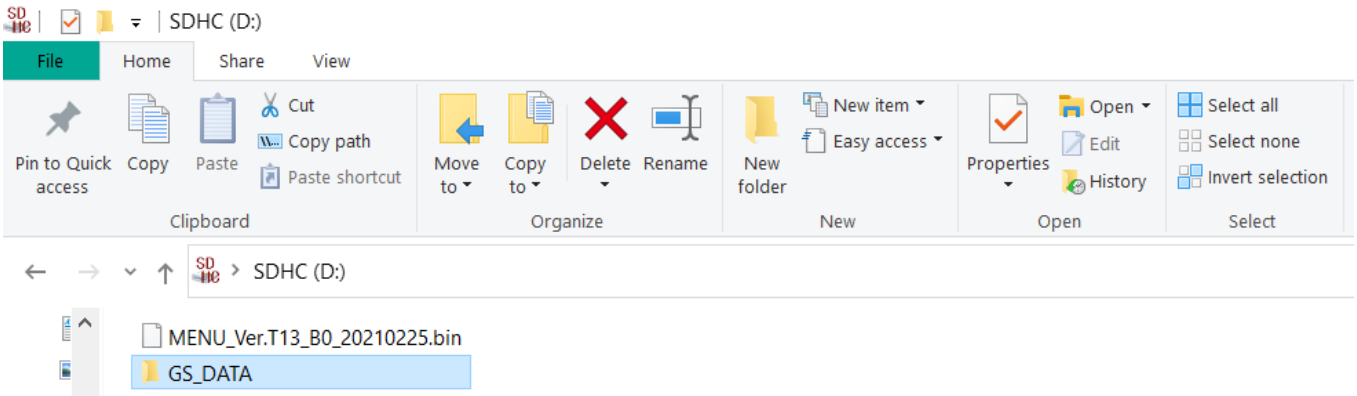
This pop-up message will stay on for a few seconds before it disappears.

Click on the message before it disappears. Once it entered, a new pop-up message (below) will appear on the upper right-hand corner of the computer LCD screen.



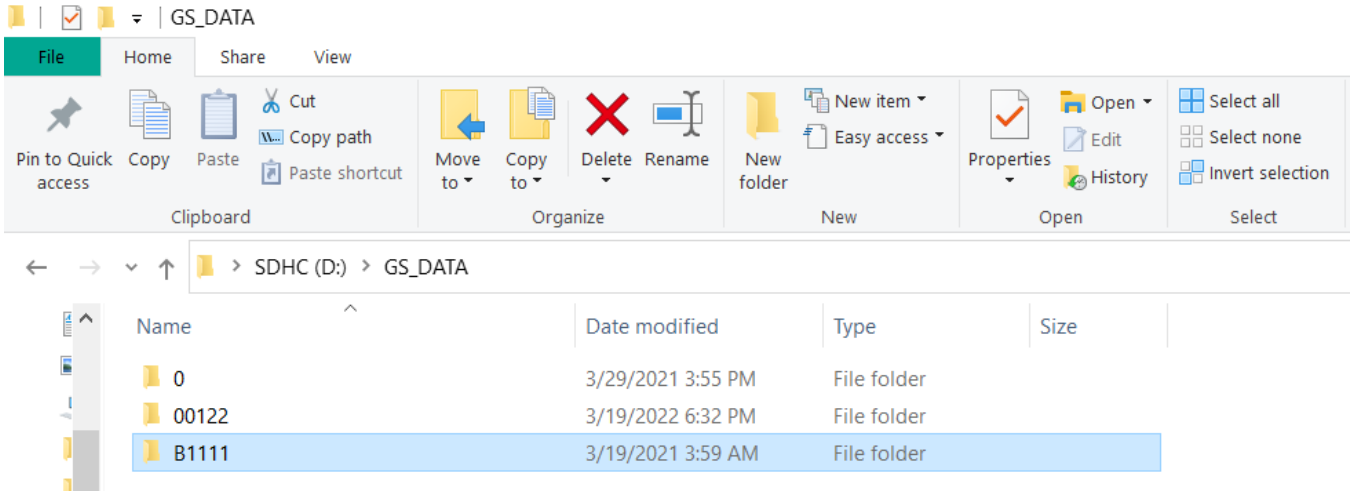
Click and open this File Explore

On this screen, move the mouse pointer to [Open folder to view files] and double “left click” it to open. Once it is opened, it will show all the files in the micro SD card.

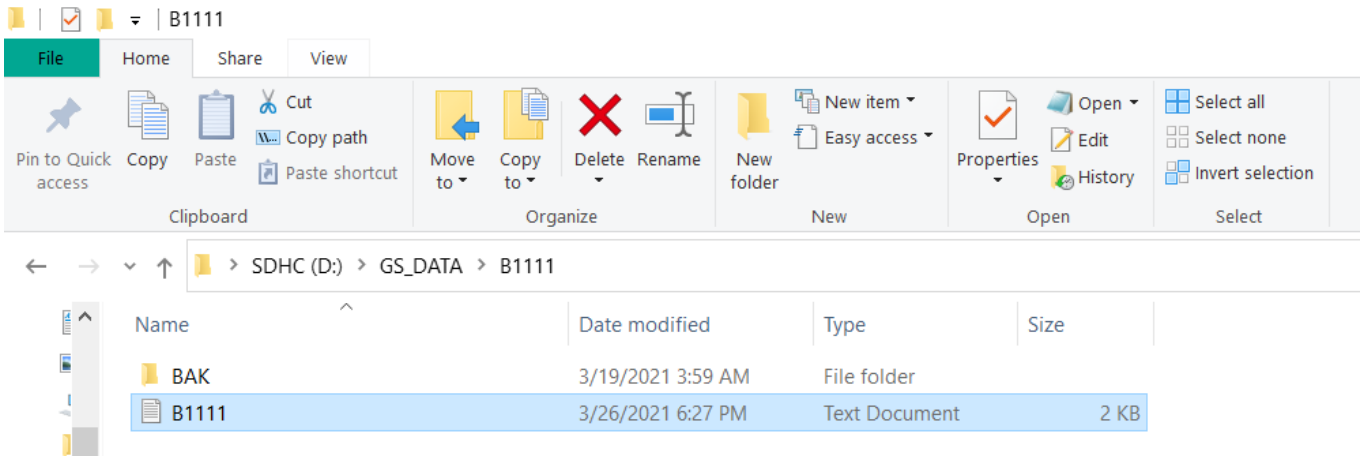


From the above display GS_DATA is the file used to stores all the Test Results in the Tester. Copy and save this file into your PC for later adding remarks or information if needed before keeping it for record purposes.

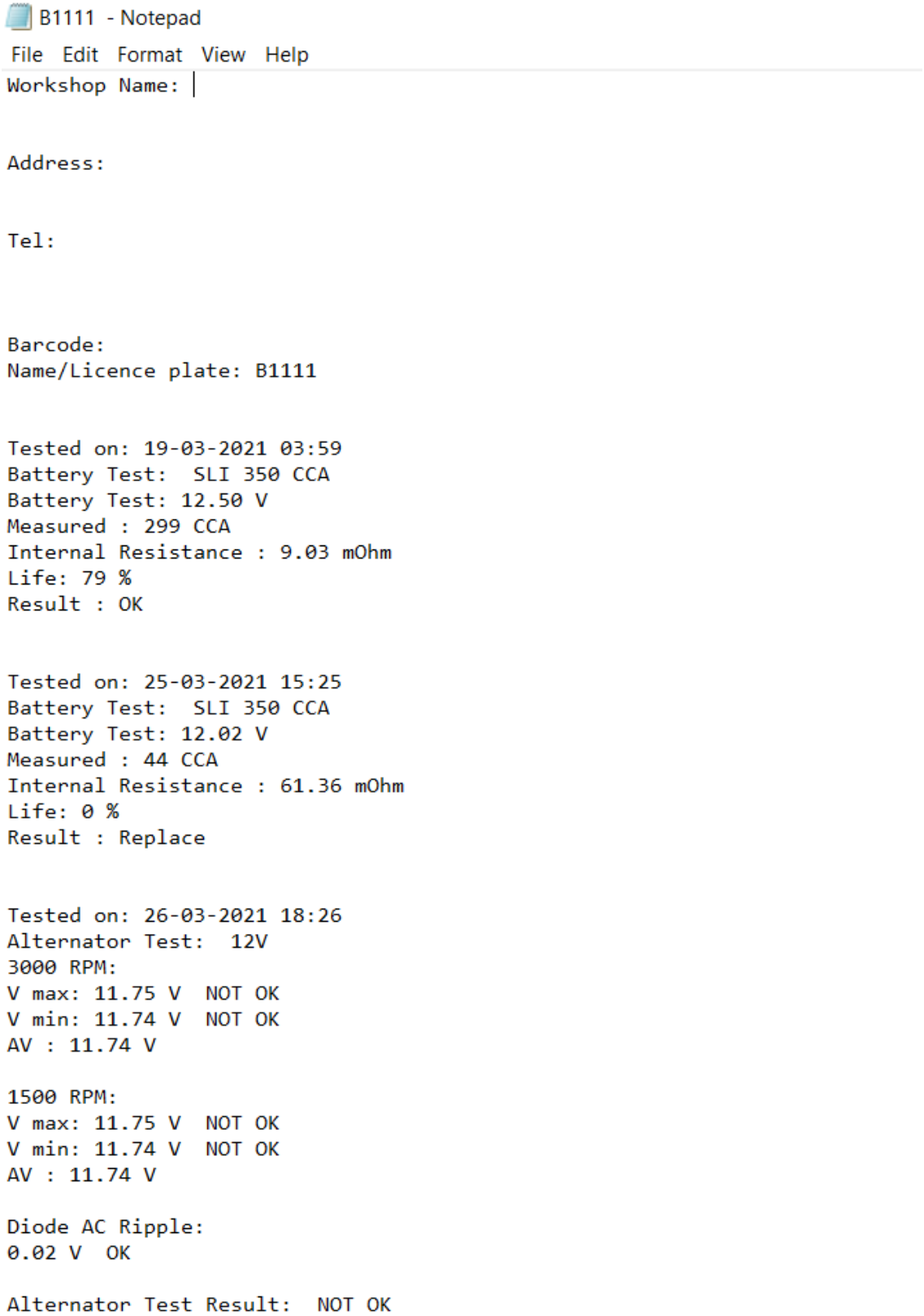
To view, open it by double “left click” with the mouse on this file and it will open showing all the Test Results files. See below.



Select one of the files and click to open it (Example: File B1111 above). After it had been opened, the directory will show as below:



Now select file B1111 and open it. Once it is opened, the results will be display in Notepad format. Scroll down the page and you will notice that it will show all the particulars like the header (Workshop name, Address, Telephone numbers, etc) and the records of the number of test (date and time) done.



T14 will store all the test results done under the file name selected according to the time and date that test was conducted.

Editing (make comments or remarks) can be done on the file while it is in this page on the PC.

After completing the transfer all the results to the PC, please remember to remove the micro SD card and plug it back into the T14 micro SD slot.

Specifications:

Operating Voltage:	6V ~ 36V DC (max)			
Analysing Capacity (Amps):				
Automotive Batteries:	CCA/SAE:	100A ~ 2000A	EN:	100A ~ 2000A
(6V / 8V / 12V)	CA/MCA:	100A ~ 2000A	IEC:	100A ~ 2000A
	DIN:	100A ~ 2000A	JIS#:	100A ~ 2000A
Motorcycle Batteries:	CCA/SAE:	40A ~ 600A	EN:	40A ~ 600A
(6V / 12V)	CA/MCA:	40A ~ 600A	IEC:	40A ~ 600A
	DIN:	40A ~ 600A	JIS#:	40A ~ 600A
Li-Ion Batteries (12V):	CCA/SAE:	100A ~ 2000A		
	CA/MCA:	100A ~ 2000A		
AH rated capacity measurement:	3 AH ~ 220 AH max.			
DC Volts Accuracy:	± 1% Reading			
Battery analysing time:	Less than 8 seconds.			
Maximum key-in:	17 characters			
Safety:	Reverse polarity protected. Analyser will not power ON.			
Internal Memory storage:	Removable 4GB micro SD card. (With option to increase memory capacity).			
Internal battery power :	Powered by 3.7V x 3 pcs (total:11.1V) Li-Ion battery cells.			
Internal battery charger:	Input: 100V ~ 240V AC, 50/60 Hz, 0.4A max.			
	Output: 5.0V DC, 2A			
Charging cable:	2A Type C			
Printer:	**Built-in**			
Printer head:	Thermo unit.			
Paper width:	57.5mm ±0.5mm			
Paper roll diameter:	Max. 45mm			
Printing Speed:	50mm/sec			
Working Temperature:	0ºC (32°F) ~ 50ºC (122°F)			
Working Humidity:	10% ~ 80 %			
Approvals:	CE, ROHS			

BATTERY MODEL		CCA		
JIS#(NEW)	JIS#(OLD)	WET	MF	SMF
55D23R		355	480	500
55D23L		355	480	500
55D26R	N50Z	350	440	525
55D26L	N50ZL	350	440	525
60D23R		520		
60D23L		520		
65D23R		420	540	580
65D23L		420	540	580
65D26R	NS70	415	520	625
65D26L	NS70L	415	520	625
65D31R	N70	390	520	630
65D31L	N70L	390	520	630
70D23R	35-60	490	540	580
70D23L	25-60	490	540	580
75D23R		500	520	580
75D23L		500	520	580
75D26R	F100-5	490		
75D26L	F100-5L	490		
75D31R	N70Z	450	540	735
75D31L	N70ZL	450	540	735
80D23R		580		
80D23L		580		
80D26R	NX110-5	580	580	630
80D26L	NX110-5L	580	580	630
85B60K				500
85BR60K				500
95D31R	NX120-7	620	660	850
95D31L	NX120-7L	620	660	850
95E41R	N100	515	640	770
95E41L	N100L	515	640	770
105E41R	N100Z	580	720	880
105E41L	N100ZL	580	720	880
105F51R	N100Z	580		
105F51L	N100ZL	580		
115E41R	NS120	650	800	960
115E41L	NS120L	650	800	960
115F51R	N120	650	800	960
115F51L	N120L	650	800	960
130E41R	NX200-10	800		
130E41L	NX200-10L	800		
130F51R		800		
130F51L		800		
145F51R	NS150	780	920	
145F51L	NS150L	780	920	
145G51R	N150	780	900	1100
145G51L	N150L	780	900	1100
150F51R	NT200-12	640		
150F51L	NT200-12L	640		
165G51R	NS200	935	980	
165G51L	NS200L	935	980	
170F51R	NX250-12	1045		
170F51L	NX250-12L	1045		
180G51R	NT250-15	1090		
180G51L	NT250-15L	1090		
195G51R	NX300-51	1145		
195G51L	NX300-51L	1145		
190H52R	N200	925	1100	1300
190H52L	N200L	925	1100	1300
245H52R	NX400-20	1530	1250	
245H52L	NX400-20L	1530	1250	

BATTERY MODEL		CCA		
JIS#(NEW)	JIS#(OLD)	WET	MF	SMF
26A17R		200		
26A17L		200		
26A19R	12N24-4	200	220	264
26A19L	12N24-3	200	220	264
28A19R	NT50-N24	250		
28A19L	NT50-N24L	250		
32A19R	NX60-N24	270	295	
32A19L	NX60-N24L	270	295	
26B17R		200		
26B17L		200		
28B17R		245		
28B17L		245		
28B19R	NS40S	245		
28B19L	NS40LS	245		
32B20R	NS40	270		
32B20L	NS40L	270		
32C24R	N40	240	325	400
32C24L	N40L	240	325	400
34B17R		280		
34B17L		280		
34B19R	NS40ZA	270	325	400
34B19L	NS40ZAL	270	325	400
34B19RS	NS40ZAS	270	325	400
34B19LS	NS40ZALS	270	325	400
36B20R	NS40Z	275	300	360
36B20L	NS40ZL	275	300	360
36B20RS	NS40ZS	275	300	360
36B20LS	NS40ZLS	275	300	360
38B20R	NX60-N24	330	340	410
38B20RS	NT60-N24S	330	340	410
38B20L	NX60-24L	330	340	410
38B20LS	NX60-24LS	330	340	410
40B20L		330		
40B20R		330		
42B20R		330		
42B20L		330		
42B20RS		330		
42B20LS		330		
46B24R	NS60	325	360	420
46B24L	NS60L	325	360	420
46B24RS	NS60S	325	360	420
46B24LS	NS60LS	325	360	420
46B26R	NS60	360		
46B26L	NS60L	360		
46B26RS	NS60S	360		
46B26LS	NS60LS	360		
48D26R	N50	280	360	420
48D26L	N50L	280	360	420
50B24L	NT80-S6L	390		
50B24R	NT80-S6	390		
50D20R		310	380	480
50D20L		310	380	480
50D23R	85BR60K	500		
50D23L	85B60K	500		
50D26R	50D20R		370	
50D26L	50D20L		370	
55B24R	NX100-S6	435	420	500
55B24L	NX100-S6L	435	420	500
55B24RS	NT80-S6S	430	420	500
55B24LS	NT80-S6LS	430	420	500

BATTERY MODEL			AMPS RATING	
			DIN	EN
57113	57114		400	680
57217	57218	57219	420	720
57220			420	720
57230			380	640
57412	57412L	57413	400	680
57512	57513	57531	350	570
58424			450	760
58513	58514		320	540
58515			450	760
58521	58522		320	540
58527			395	640
58811			440	720
58815	58820		395	640
58827			400	640
58833	58838		400	680
59017	59018	59040	360	600
59215			450	760
59218	59219		290	480
59226			450	760
59514			320	540
59518			395	640
59519			395	640
59615	59616		360	600
60018	60019		250	410
60026			440	720
60038	60044		500	760
60527	60528		410	680
61017	61018		400	680
61023	61047	61048	450	760
62034	62038	62045	420	680
62529			450	760
63013			470	680
63545	63549		420	680
64020			325	550
64028	64035		520	760
64036			460	760
64317	64318	64323	540	900
65513			540	900
65514	65515		570	900
67043	67045		600	1000
68021			570	950
68032	68034		600	1000
68040			570	950
70027	70029		630	1050
70036			570	950
70038			630	1050
71014	71015		700	1150
72512			680	1150
73011			740	1200
88038			175	300
88046			210	360
88056			265	450
88066			300	510
88156			320	540
88074	88092		400	680

BATTERY MODEL			AMPS RATING	
			DIN	EN
52805	52815		180	240
53517			175	300
53520	53521	53522	150	240
53621	53624	53625	175	300
53638	53646	53653	175	300
53836	53890	54038	175	300
54039	54232		175	300
54312	54317	54434	210	360
54313	54324		220	330
54437	54449	54459	210	360
54459L	54465	54466	210	360
54464			220	330
54469	54519	54533	210	360
54523	54524		220	300
54537	54545		190	300
54551	54577	54578	220	300
54579	54580	54584	220	300
54590			210	330
54612			210	360
54801			190	300
54827			240	360
55040			265	450
55041	55042		220	360
55044			265	450
55046			300	360
55048			300	510
55056	55057		320	540
55068	55069		220	390
55218			255	420
55414	55415	55421	265	450
55422			265	450
55423	55427	55428	300	510
55457			265	450
55529			220	360
55530	55531	55545	255	420
55548	55552	55559	255	420
55559L	55563	55564	255	420
55565	55565L	55566	255	420
55567			255	420
55811			360	540
56012			230	420
56048	56049	56068	250	390
56069	56073		250	390
56077	56092		300	510
56091			360	540
56111			300	540
56216	56218	56219	300	510
56220			280	510
56225	56311	56312	300	510
56318	56322	56323	300	510
56420	56530	56618	300	510
56619	56620	56633	300	510
56638	56641	56647	300	510
56821	56820	56828	315	540
57024	57029		315	540

BATTERY MODEL	AH	CCA WET	CCA AGM	BATTERY MODEL	AH	CCA WET	CCA AGM
51814	18	100		YB5L-B	5	65	
51913	19	100		YB7-A	8	124	
53030	30	180		YB7C-A	8	124	
12N5-3B	5	39		YB7L-B	8	124	
12N5.5-3B	5.5	40		YB9A-A	9	124	
12N5.5-4A	5.5	60		YB9-B	9	130	
12N5.5-4B	5.5	60		YB9L-A2	9	130	
12N5.5A-3B	5.5	58		YB9L-B	9	130	
12N7-3B	7	74		YB9L-A2	9	130	
12N7-4A	7	74		YB10A-A2	11	160	
12N7-4B	7	74		YB10L-A2	11	160	
12N7D-3B	7	74		YB10L-B	11	160	
12N9-3A	9	85		YB10L-B2	11	160	
12N9-3B	9	85		YB12A-A	12	165	
12N9-4B-1	9	85		YB12A-B	12	165	
12N10-3A	11	160		YB12AL-A	12	165	
12N10-3A-1	11	160		YB12AL-A2	12	165	
12N10-3A-2	11	103		YB12B-B2	12	165	
12N11-3A-1	11	128		YB12C-A	12	165	
12N12A-4A-1	12	113		YB14-A2	14	190	
12N14-3A	14	128		YB14A-A1	14	190	
12N20AH	18	100		YB14A-A2	14	190	
12N24-3	24	200		YB14-B2	14	190	
12N24-3A	24	200		YB14L-A1	14	190	
HYB16A-AB	16	210		YB14L-A2	14	190	
SYB14L-A2	14	190		YB14L-B2	14	190	
SY50-N18L-AT	20	260		YB16L-A2	16	200	
Y50-N18A-A	20	260		YB16-B	19	240	
Y50-N18L-A	20	260		YB16B-A	16	207	
Y50-N18L-A2	20	260		YB16B-A1	16	207	
Y50-N18L-A3	20	260		YB16-B-CX	19	240	
Y60-N24-A	28	300		YB16CL-B	19	240	
Y60-N24L-A	28	300		YB16HL-A-CX	18	270	
Y60-N24AL-B	30	180		YB16L-B	19	240	
YB2.5L-C	2.5	19		YB18-A	18	235	
YB2.5L-C-1	2.5	19		YB18L-A	18	235	
YB2.5-C-2	2.5	19		YB30CL-B	30	300	
YB3L-A	3	32		YHD-12	28	240	
YB3L-B	3	32		YIX30L	30		385
YB4L-A	4	56		YT4B-4	2.3		40
YB4L-B	4	56		YT4B-BS	2.3		40

BATTERY MODEL	AH	CCA WET	CCA AGM	BATTERY MODEL	AH	CCA WET	CCA AGM
YT4L-4	3		50	YTZ12S-BS	11		210
YT7B-4	6.5		110	YTZ14S	11.2		230
YT7B-BS	6.5		110	YTZ14S-BS	11.2		230
YT9B-4	8		120				
YT9B-BS	8		120	TTZ7S-BS	6		130
YT12A-BS	10		175	TTZ10S	8.6		190
YT12B-BS	10		210	TTZ12S-BS	11		210
YT12B-4	10		210	TTZ14S-BS	11.2		230
YT14B-BS	10		210				
YTR4A-BS	2.3		45				
YTR9-4	10		175	**POWER MAX**			
YTR9-BS	10		175	GT4L-BS	3		50
YTR9-4	10		175	GT5L-BS	4		70
YTX4L-BS	3		50	GTX7A-BS	6		90
YTX5L-BS	4		80	GT7B-4	6.5		85
YTX5L-4	4		80	GT7L-BS	6		85
YTX7A-BS	6		105	GTZ7S	6		130
YTX7L-BS	6		100	GT9B-4	8		115
YTX9-BS	8		135	GTY9-BS	8		120
YTX12-4	10		180	GTZ10S	8.6		190
YTX12-BS	10		180	GT12B-4	11		125
YTX14-4	12		200	GTX12A-BS	10		175
YTX14-BS	12		200	GTX12-BS	10		180
YTX14AH-BS	12		210	GTZ12S	11		210
YTX14L-4	12		200	GTZ14S	11.2		230
YTX15L-BS	13		230	GT14B-4	12		210
YTX16-BS	14		230	GTX14AH-BS	12		210
YTX16-4-1	14		230	GTX14AHL	12		210
YTX16-BS-1	14		230	GTX14L-BS	12		200
YTX20-4	18		270	GTX14-BS	12		200
YTX20-BS	18		270	GTX15L-BS	13		210
YTX20L-4	18		270	GTX16-BS	14		230
YTX20L-BS	18		270	GTX16-BS-1	14		230
YTX24HL-BS	21		350	GTX16CLB-BS	19		310
YTZ6	5		90	GTX20-BS	18		270
YTZ6S-BS	5		90	GTX20CH-BS	18		270
YTZ7S	6		130	GTX20HL-BS	18		310
YTZ7S-BS	6		130	GTX20L-BS	18		270
YTZ10S	8.6		190	GIX50L-BS	21		350
YTZ10S-BS	8.6		190	GTX24HL-BS	21		350
YTZ12S	11		210	GIX30L-BS	30		385

BATTERY MODEL	AH	CCA WET	CCA AGM
ADVENTURE POWER			
HUB16A-AB	16	190	
UT4L-BS	3		35
UT5L	4		55
UTZ7S	6		90
UTX7A	6		85
UTX7L	6		85
UTB-4	6		85
UTX9	8		120
UTX9B-4	8		115
UTZ10S	8.6		150
UT12B-4	10		130
UTX12	10		150
UBVT-8	12		200
UTX14AH	14		190
UTX14AHL	12		190
UBVT-3	12		200
UTX14B-14	12		145
UBTZ14S	11.2		175
UTX14	14		200
UTX16-1	14		200
UT16B	19		240
UT16L-B	19		240
UBVT-4	19		240
UBVT-5	19		240
UT16CL	19		190
UTX20	18		250
UBVT-1	18		310
UB22-12N	22		420
UBVT-6	22		350
UBVT-2	30		385
UBVT-7	28		240
POWER SOURCE			
WP4L-B	3		80
WP5L-B	4		80
WP7L-B	6		140
WP7A-B	6		90
WP7B-4	6.5		125
WPZ7S	6		180
WP9-B	8		180
WP9B-4	8		180
WPZ10S	8.6		225
WP12A-BS	9.5		175
WP12-B	10		220
WP12B-4	10		225
WPZ12S	11		250
WP14B-4	12		180
WPZ14S	11.2		250
WP14-B	12		210
WP14L-2	12		210
WPX14AH-BS	12		210
WPX15L-BS	13		300
WPH16	14		230
WPH16	14		230
WP16L-B	19		230
WP16L-B	20		325
WPX20L-BS	18		310
WPX20-BS	18		310
WP20-12I	20		325
WP50N18L-A	21		350
WP50N18L-A3	22		350
WESTCO			
12VX4LB	4		45
12VX5LB	5		70
12V7LB	7		85
12V7B-B	7		85
12V7A-BS	7		90
12VZ7S	7		130
12V9B-4	8		115
12V9-B	9		120
12VZ10S	9		190
12V12B-4	10		125
12V12A-BS	11		175
12V12-B	10		180
12V13L	13		275
12V14-B	14		200
12V14B-4	12		135
12V14L-B	14		200
12V14-A2	14		210
12V16-B	14		230
12V16-A2	14		230
12V16CLB	19		260
12V20P	20		275
12V20	18		300
12V20L	18		300
12V22	22		350
12V30	30		350
12VX30L-B	30		350
BIG CRANK			
ETX9	8		120
ETX12	10		180
ETX14	12		220
ETX15	14		220
ETX15L	14		220
ETX16	19		325
ETX16L	19		325
ETX18L	20		340
ETX20L	17.5		310
ETX30L	26		400
ODYSSEY			
PC310	8		100
PC535	14		200
PC545	13		150
PC625	18		200
PC680	16		170
PC925	28		330
PC1200	42		540
SHORAI			
LFX07L2-BS12	7		102
LFX09L2-BS12	9		135
LFX09A2-BS12	9		135
LFX12A1-BS12	12		155
LFX14A1-BS12	14		210
LFX14A2-BS12	14		210
LFX14A4-BS12	14		210
LFX14A5-BS12	14		210
LFX14LS-BS12	14		210
LFX14L2-BS12	14		210
LFX14A4-BS12	14		210
LFX14A5-BS12	14		210
LFX14L5-BS12	14		210
LFX14L2-BS12	14		210
LFX18A1-BS12	18		270
LFX18L1-BS12	18		270
LFX21A6-BS12	21		315
LFX21L6-BS12	21		315
LFX24A3-BS12	24		360
LFX24L3-BS12	24		360
LFX27A3-BS12	27		405
LFX27L3-BS12	27		405
LFX36A3-BS12	36		540
LFX36L3-BS12	36		540