EV Charging Tester

The EV charging tester is an equipment that determines the status of quick/normal charges, high-voltage relay, and the presence of any abnormality in quick and high-voltage charging path of the electric vehicle.

Precautions Before Use

Precautions when handling high-voltage parts

The user is responsible for all damages that are caused by not understanding the contents of this EV charging tester Manual thoroughly or by controlling it differently from the contents of the User Manual.

- Before inspecting or repairing high-voltage system, make sure to separate the safety plug to cut off the high voltage.
- Make sure to remove metal objects substances (watch, ring, and other metal products, etc.) from your body as they may cause high-voltage short circuit, which causes human and vehicle damages.
- Before starting any operation related to high voltage, please wear personal protective equipment for safety accident prevention.
- Please make sure that persons other than the operator wearing the protective equipment are prohibited from touching any part related to high-voltage parts.

Precautions when utilizing the product

Personal injuries or material damages can occur if the user does not pay attention for handling, and more serious results may occur under certain conditions. Please comply with all safety rules and instructions.

- Remove foreign materials from the component and keep its cleanliness before and after using the equipment.
- Make sure you familiarize yourself with contents of the manual before use, and follow the procedures and instructions.
- Before using the equipment, please familiarize yourself with safety instructions for vehicle management.
- Use the equipment only in a well-ventilated space, and make sure to weak protective equipment (protective glasses and gloves, etc.).
- If the equipment is damaged by external shock, immediately stop using the equipment. If the equipment needs to be repaired, make sure to request the equipment manufacturer to perform the repair work. (Abnormal repair may become the cause of equipment damage)
- Make sure to use a grounded circuit.
- Use only with the power source (AC 110~220V, 50/60Hz) intended by the manufacturer.
- The equipment must not be exposed to rain or snow.
- The equipment must not be used for purposes other than the purpose of its manufacture.
- Do not leave the equipment being installed in the vehicle.
- If you do not use the equipment within its operating temperature range (0 ~ 104℉/40 ℃).

Warning

These connectors are used for *CP/*PD voltage check and only trained professionals should use (or access).

Measuring voltage:

CP: 12V ±0.3V, PD: 3V ±0.3V

*CP: Control Pilot

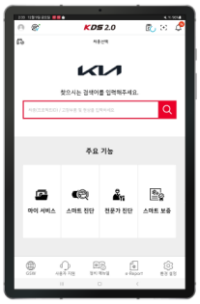
*PD: Proximity Detection

Hardware

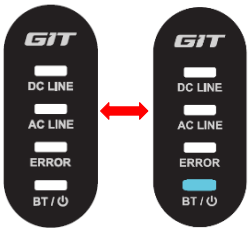
Specification

Item	Specification
LED Status	4 Color LEDs(DC LINE/ AC LINE/ ERROR/ Power, BT)
Wireless communication	Bluetooth V5.0(BLE)
High voltage range	DC 800V MAX
Current range	12A MAX
Operating power(±10%)	AC 110~220V/50~60Hz/1A
Operating temperature	0℃ ~ +40℃
Operating humidity/altitude	Up to 20~80 % R.H/ 2000m
Operating place	Indoor place
Overvoltage category	II
Size and weight	CCS2-Type(Europe):70mm x 361mm x 240mm / 1.7kg

EV charging test components

Name	Component	Major function
EV charging tester		1. Controls the conditions for the charging test. 2. Measures high voltage/current.
KDS 2.0		1. Performs the test sequence. 2. Indicates the test measured values.
VCI II		1. Performs the vehicle diagnostic communication. (Connects the OBD terminal of the vehicle.)

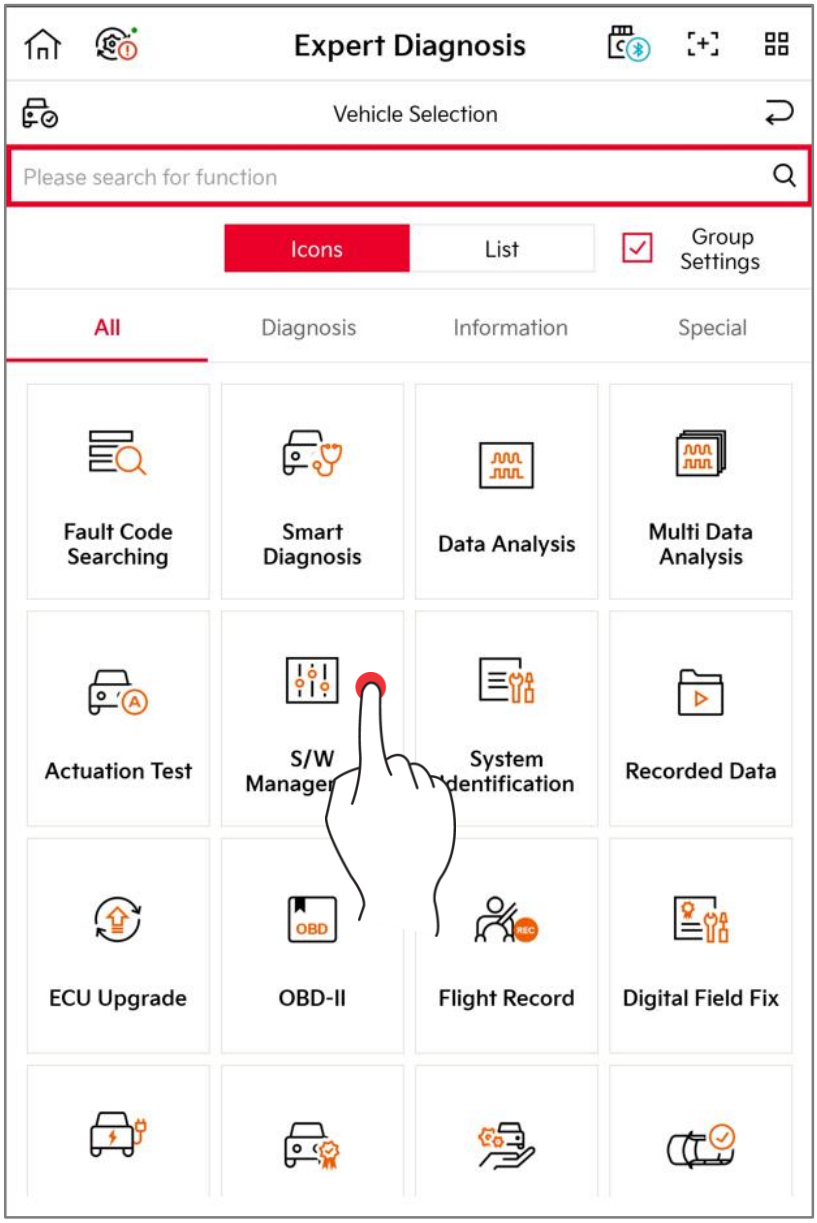
Detailed description of the EV Charging Tester LED

Name	Major function	LED status	
DC LINE	Indicates the test results on rapid charging line.	 OK	 NG
AC LINE	Indicates the test results on standard charging line.	 OK	 NG
ERROR	Indicates the occurrence of system error.	 OK	 NG
BT/Power	- Indicates the power. - Indicates the connection status between the diagnostic apparatus and the test equipment.	 Connected	 Not connected (the light flickers once a second)

Advanced Preparation – Entering into the function screen

Phase1

Tab [Expert Diagnosis] -[S/W Management].

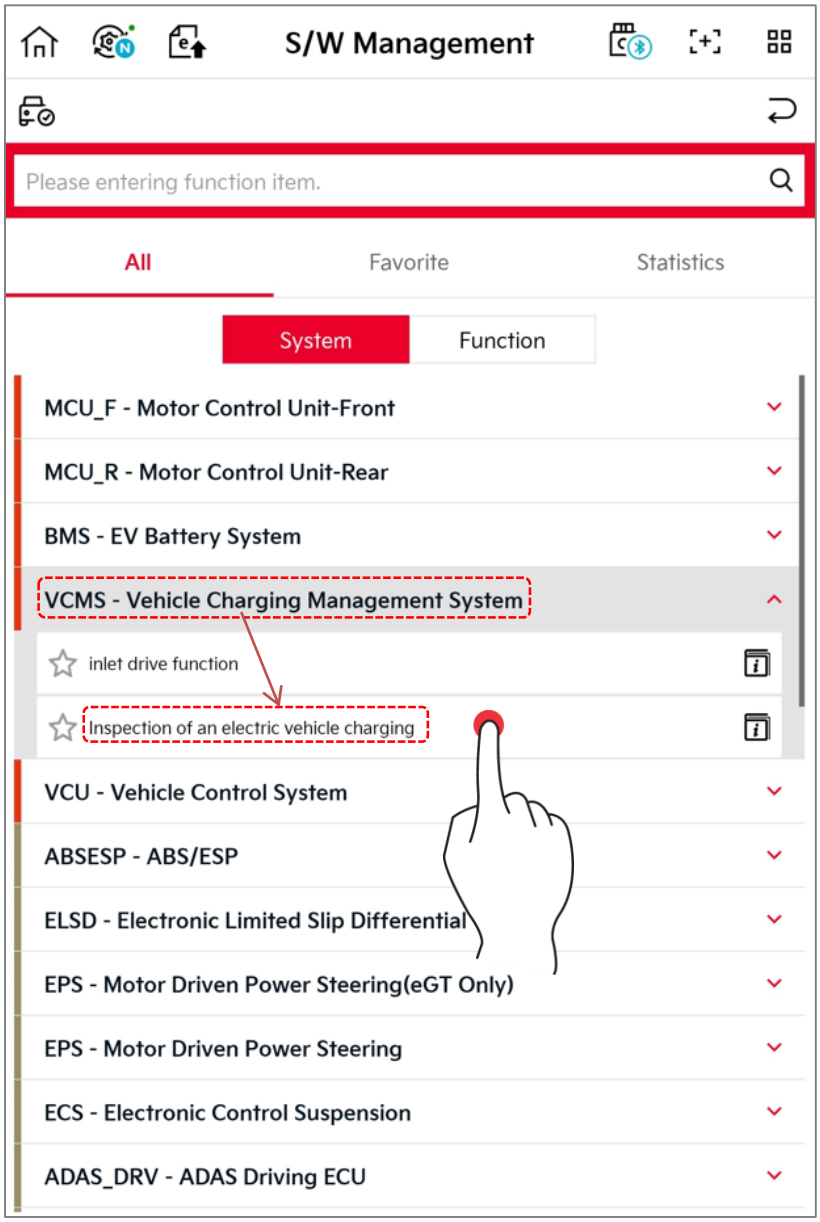


Reference

Before performing the function, VCI II must be connected to OBD connector on the vehicle.

Phase2

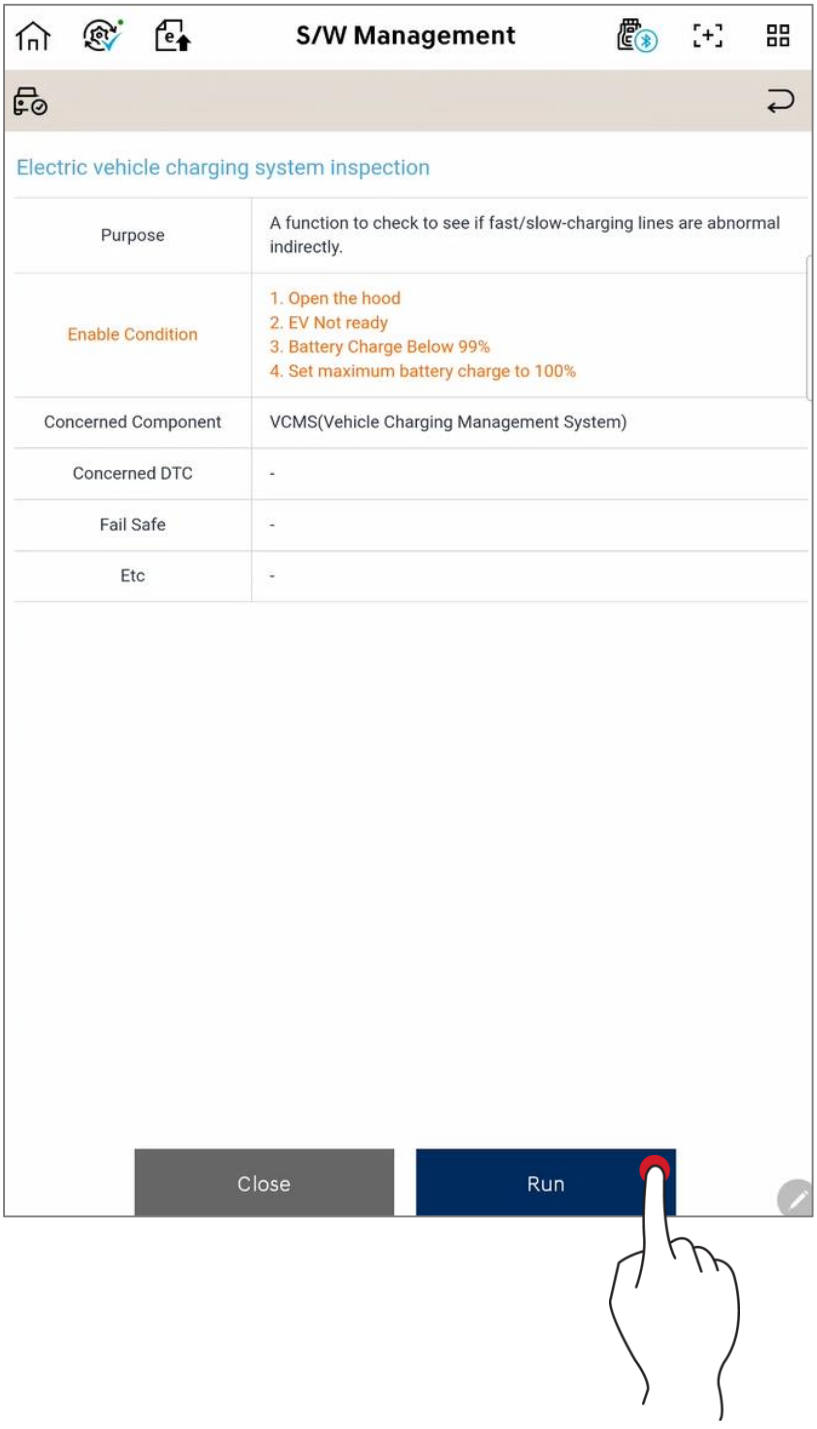
Tab [Vehicle Charging Management system] -> [Inspection of an electric vehicle charging] menu.



Advanced Preparation - Connection of the equipment

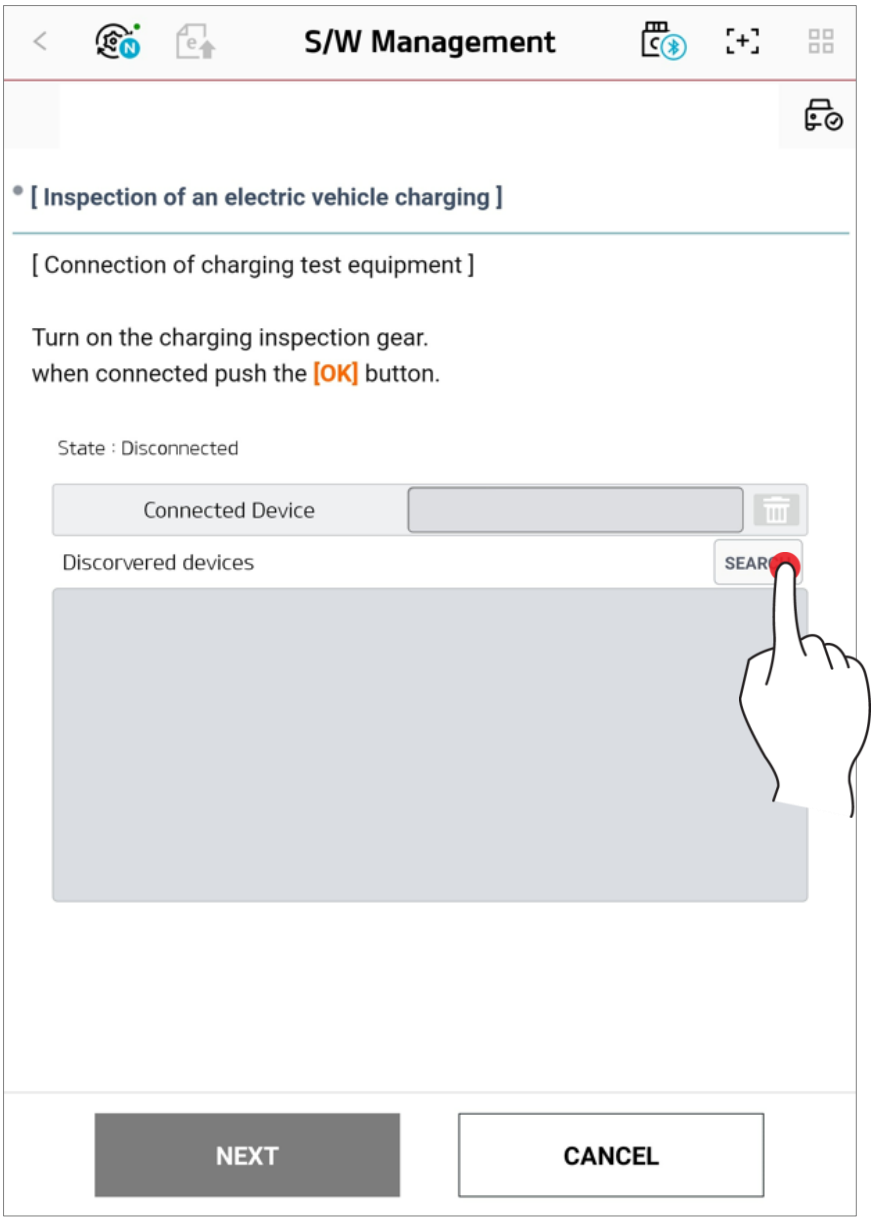
Phase1

After checking the purpose and condition of the EV charging test, tab Run button at the bottom of the screen.



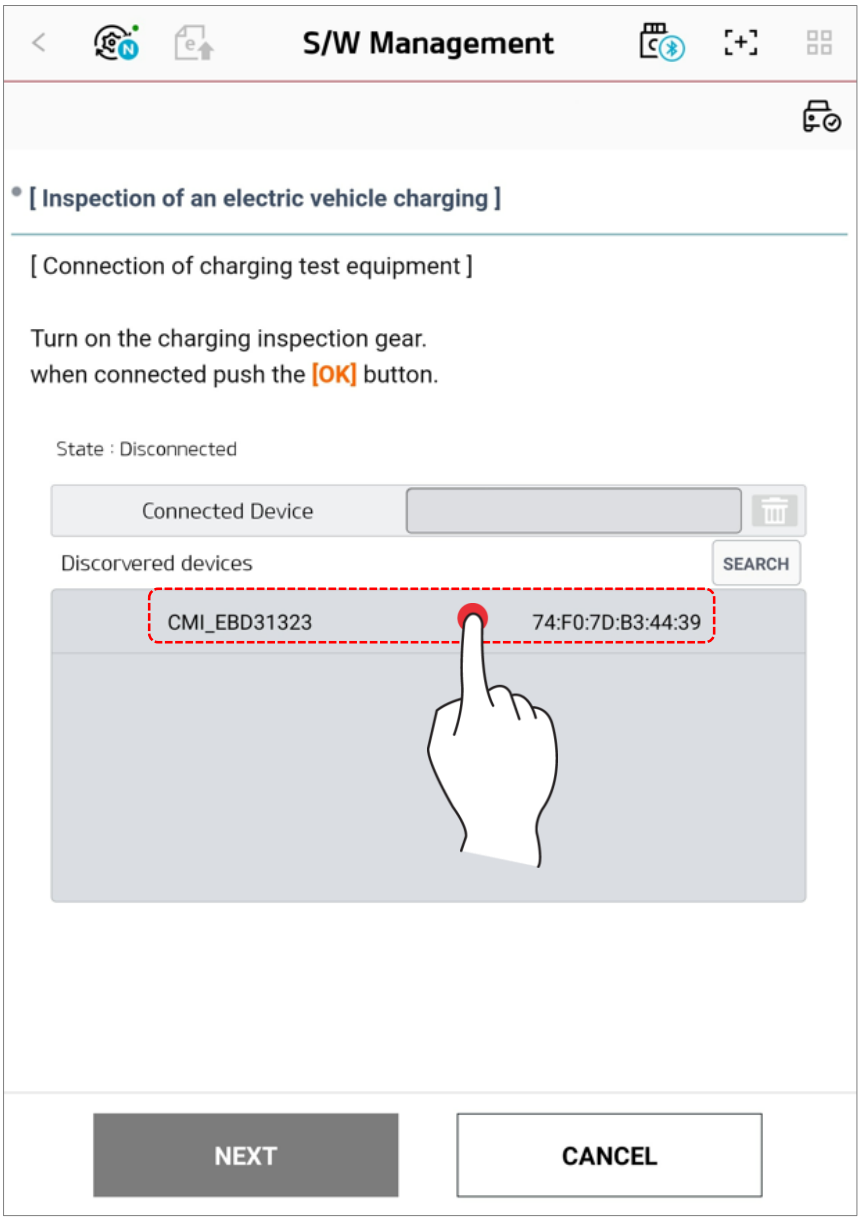
Phase2

Tab SEARCH button to connect the charging test equipment.



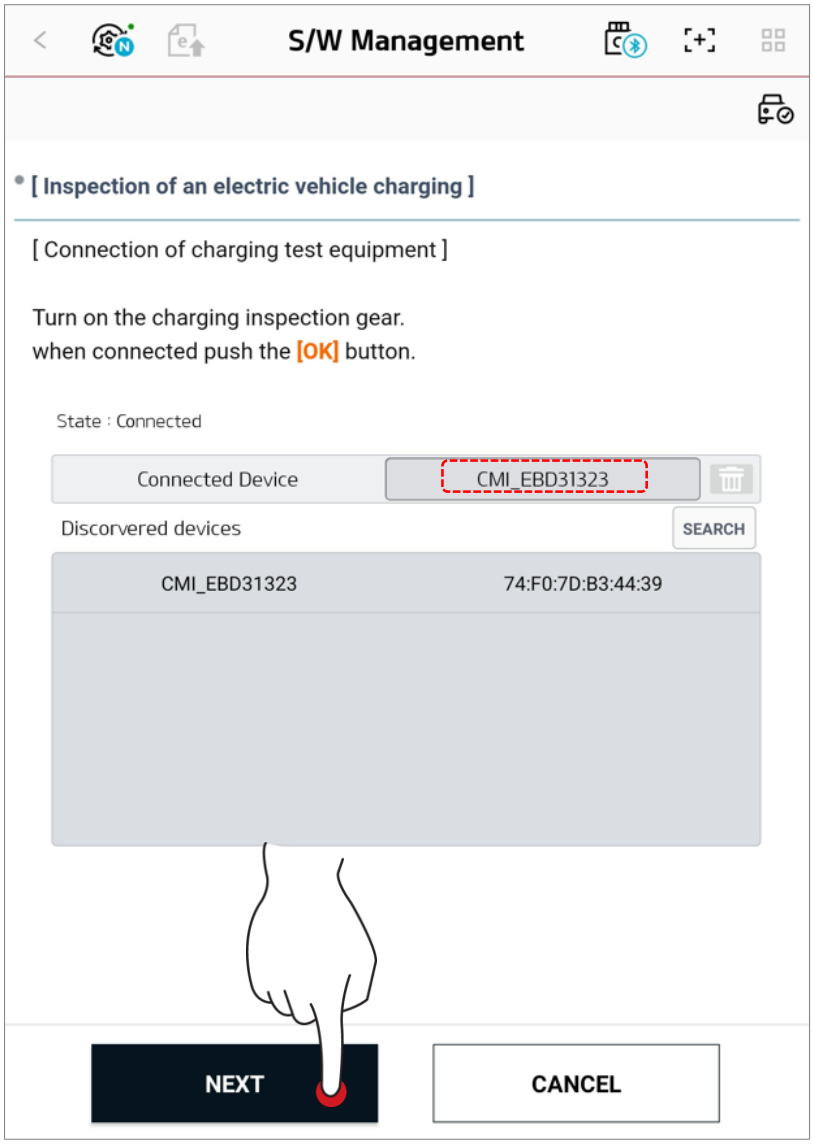
Phase3

Tab the equipment in the research result.



Phase4

After the selected, the equipment is registered in “Connected Device” list, tab NEXT button at the bottom of the screen.



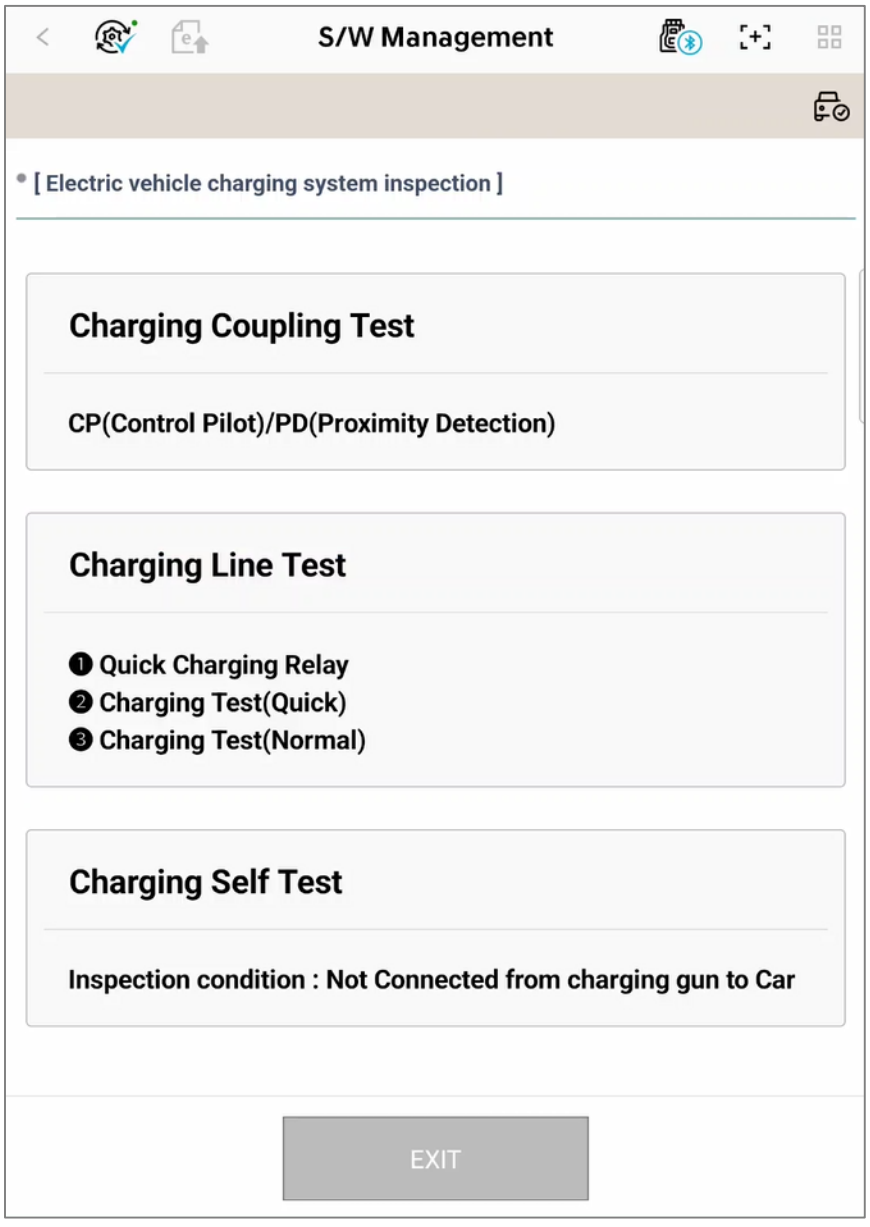
Phase5

Once the BT signal of the equipment is connected normally, “BT/Power” LED of the equipment main body will be turned on with blue light.

Major Function

Main screen

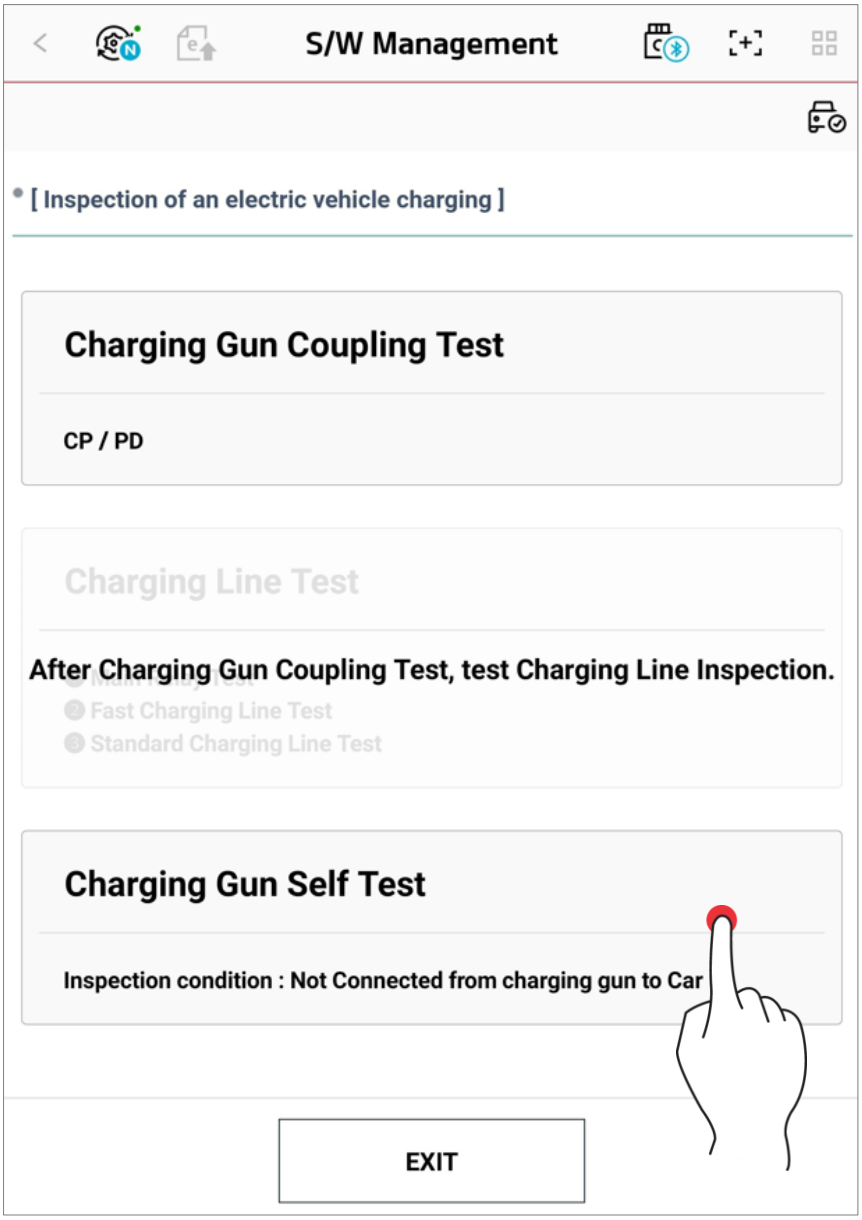
It shows major functions of the EV charging line test, and the users can run a desired function by touching it.



Self-test on the test equipment

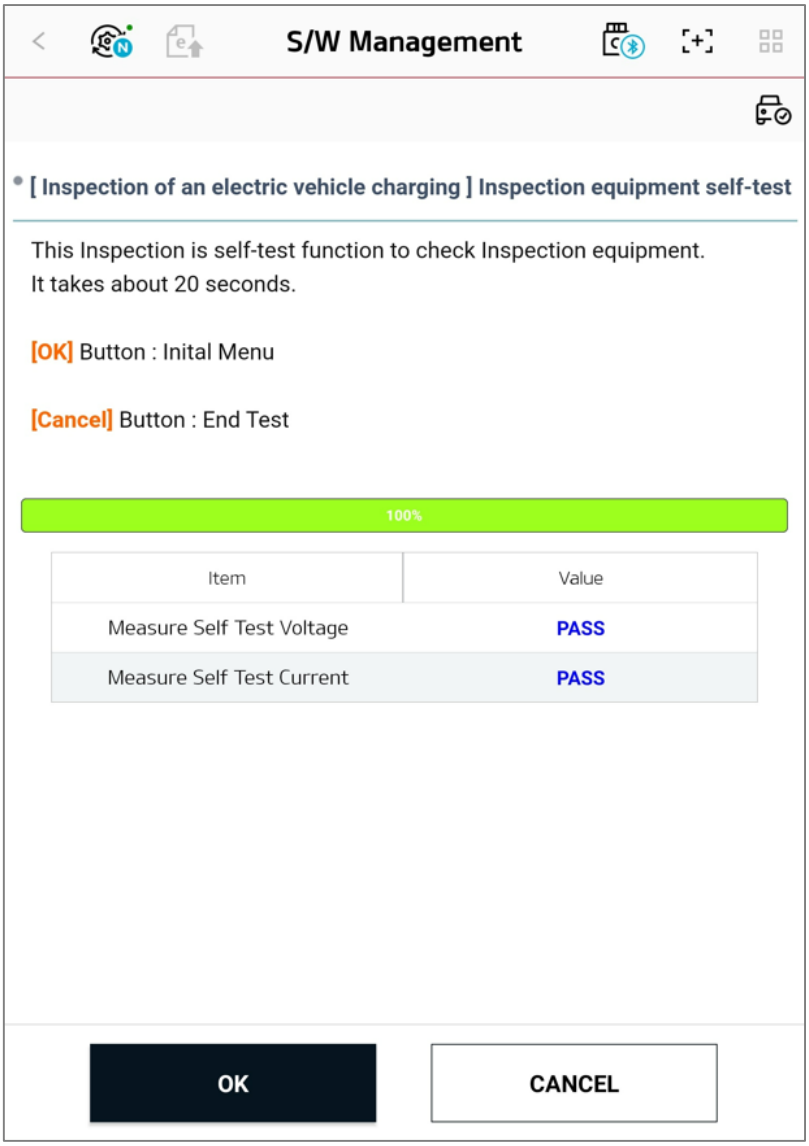
Phase 1

This is a function is for checking the status of EV Charging tester whether there is abnormality in charging when an error occurs while the main test function is being operated, or if there is no change in voltage in connection test. Tab [Charging Gun Self-test]



Phase 2

Once you enter into the function screen, the self-test will begin, and the results will be shown on the screen after approximately 20 seconds.

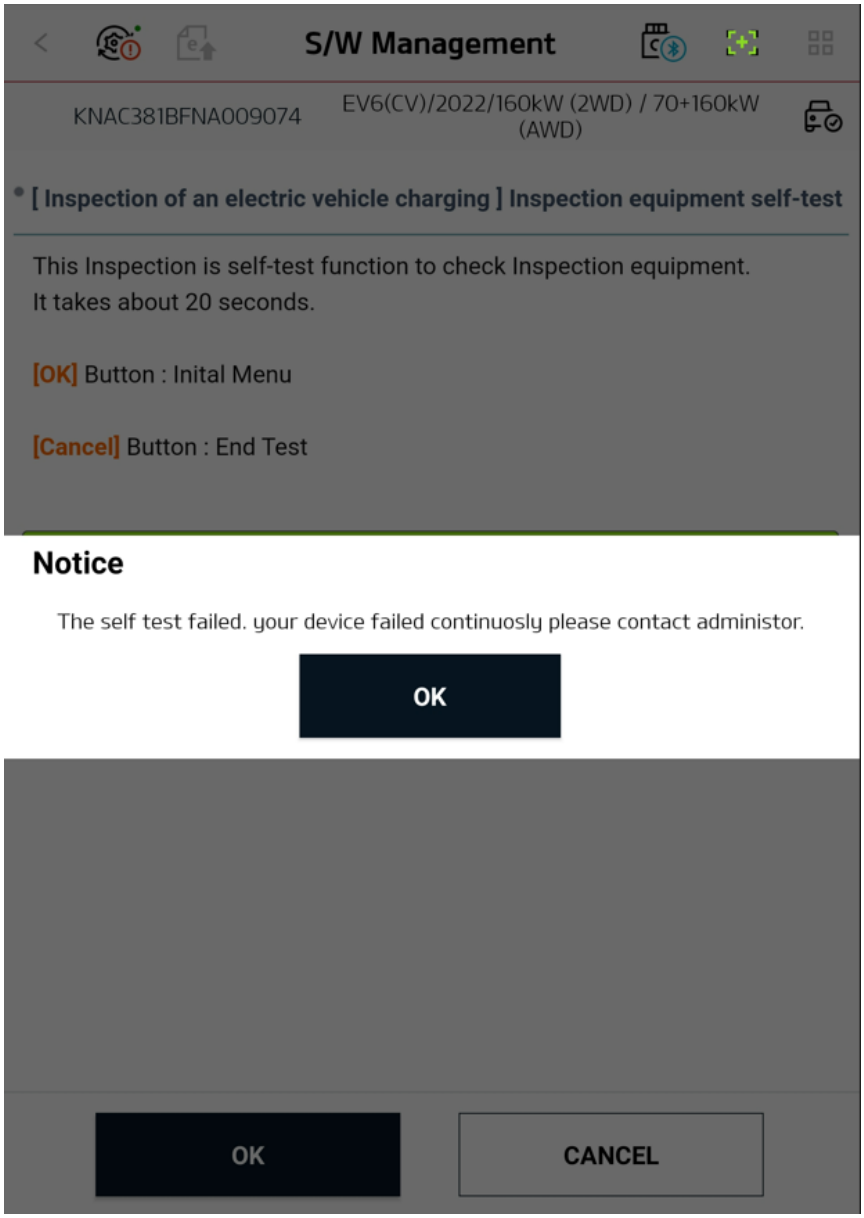


Notification

Please run the corresponding function only after removing the charging test from the inlet.

Notification

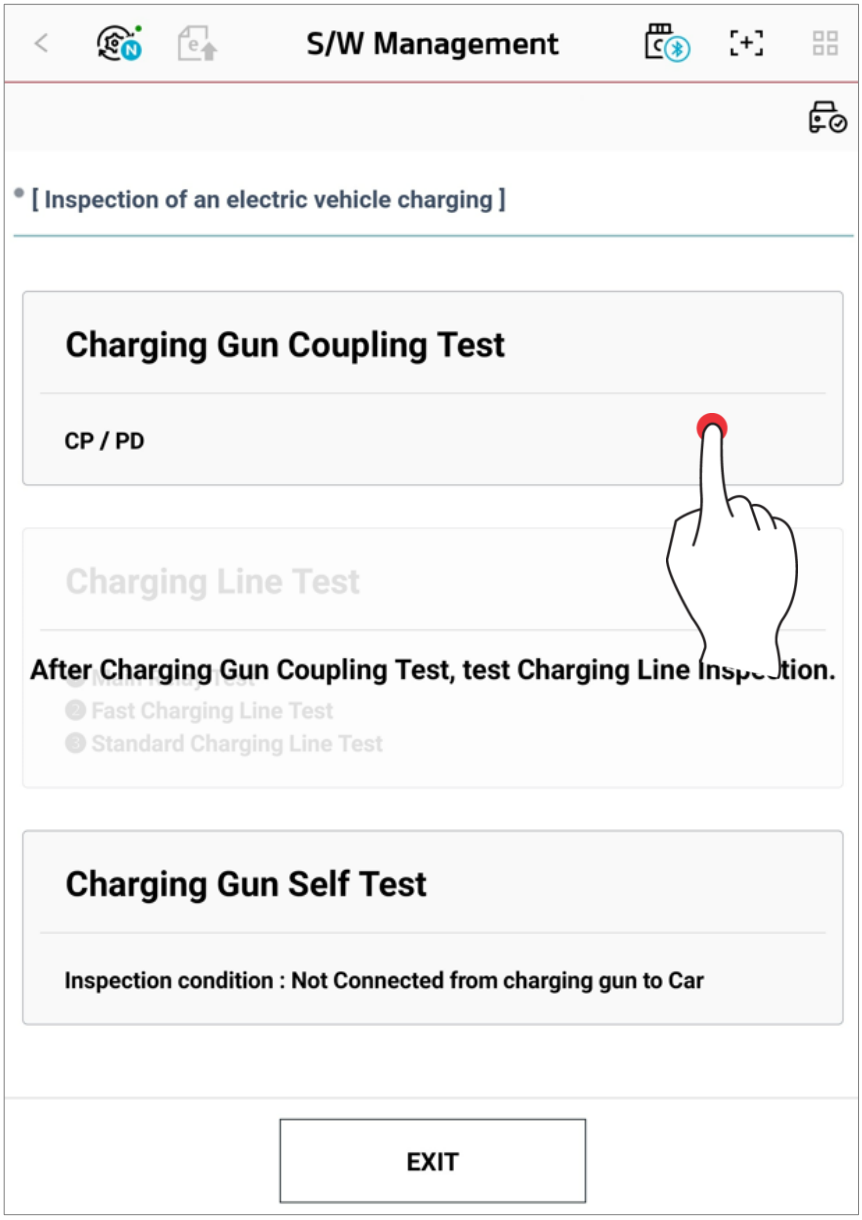
The message below will appear when failure occurs.



Charging Coupling test

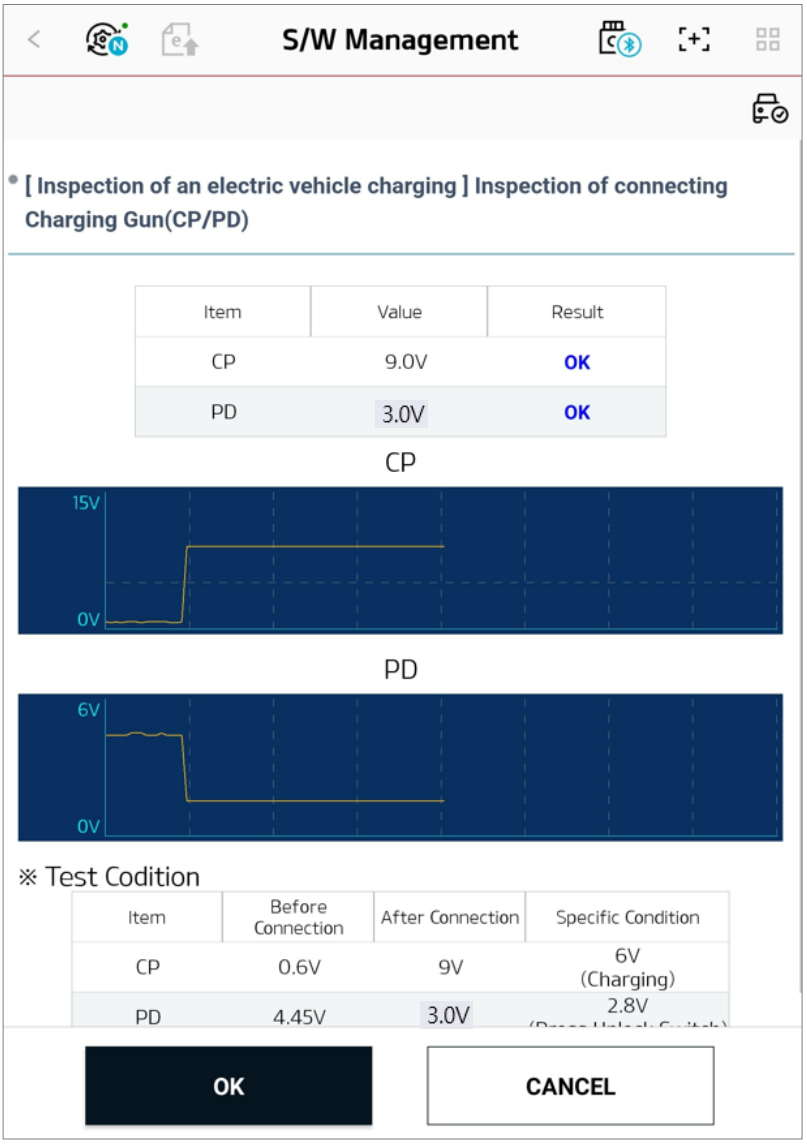
Phase 1

This is a function that measures CP/PD voltage value to check whether the charging test equipment is normally connected to the inlet.



Phase 2

The table at the top of the screen shows voltage value per operation and test results. The graph in the middle of the screen shows change in CP/PD voltage values of the controller, which are measured in real time through the diagnostic communication.



Determination condition

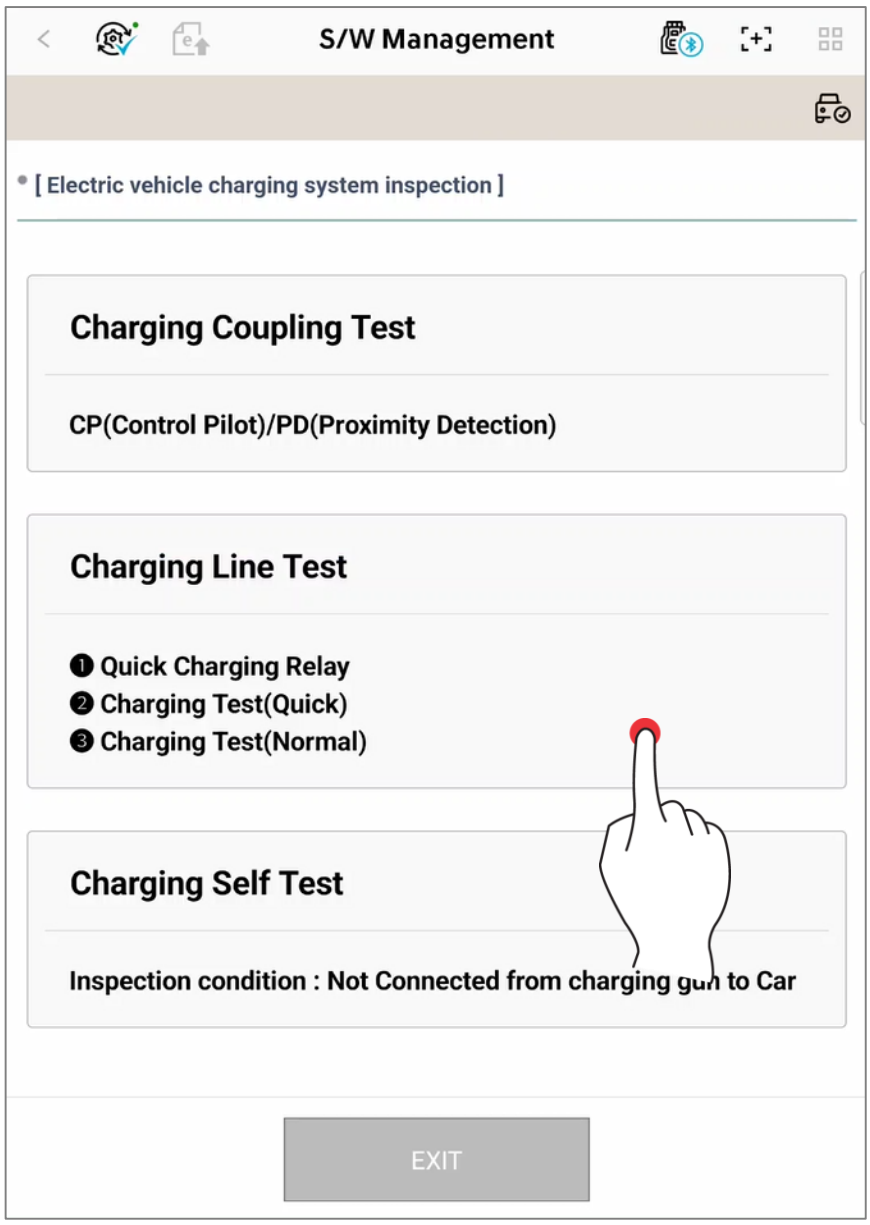
Europe (CCS2)	Measured Value	Determination
CP	9V±0.3	OK
PD	3V±0.3	NG

Charging line test

Description

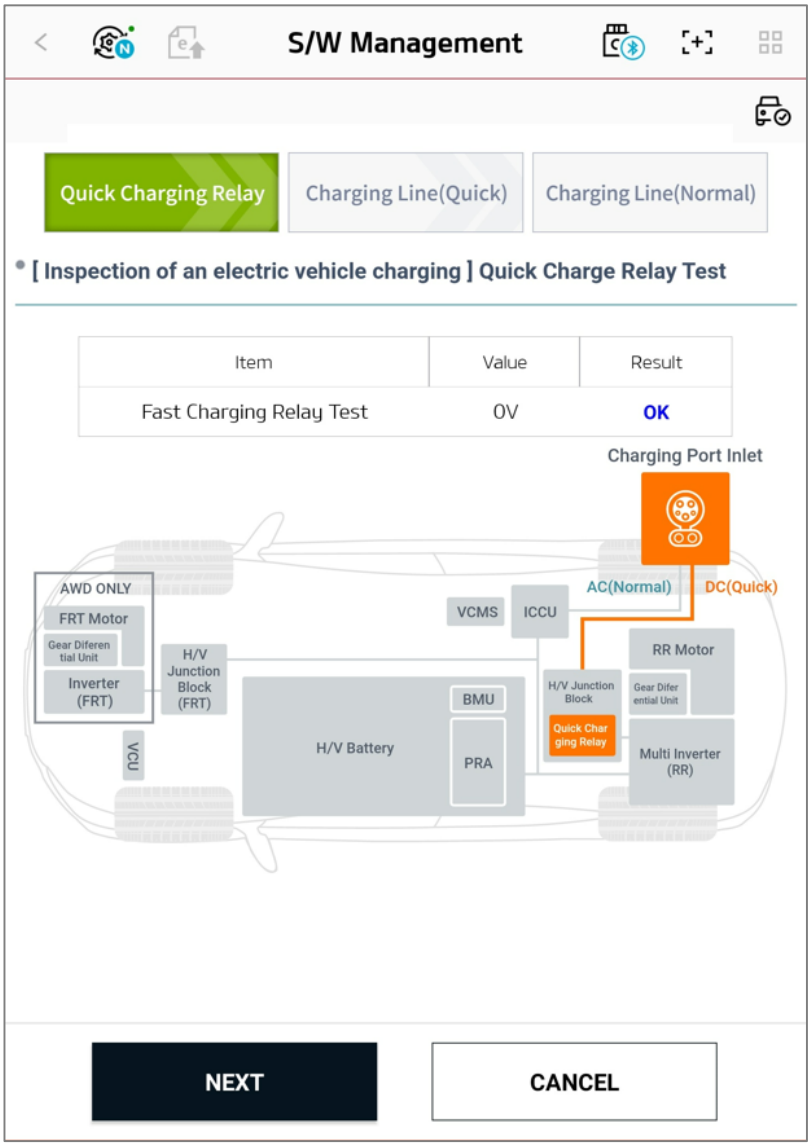
The following 3 different functions will be performed as the main test functions:

1. Quick charge relay test
2. Quick charging line test
3. Standard charging line test



Quick charge relay test

This is a test that checks if there is abnormality in the quick charge relay operation through a high-voltage quick charge port.



Determination condition

Measured Value	Determination
0V	OK
exceeds 0V	NG

Quick charging line test

This is a test that checks whether there is abnormality in the quick charging line that goes through [high-voltage battery -> inverter -> charge port] through the path of the high-voltage quick charge port.

Determination condition

Comparison between *the charging equipment measured values and *diagnostic communication values

Deviation	Determination
Less then 20%	OK
0V or 20% or more	NG

* Charging equipment measured value: BMU controller's diagnosis communication voltage value

* Diagnostic communication value: actually measured voltage value of the high-voltage quick charge port

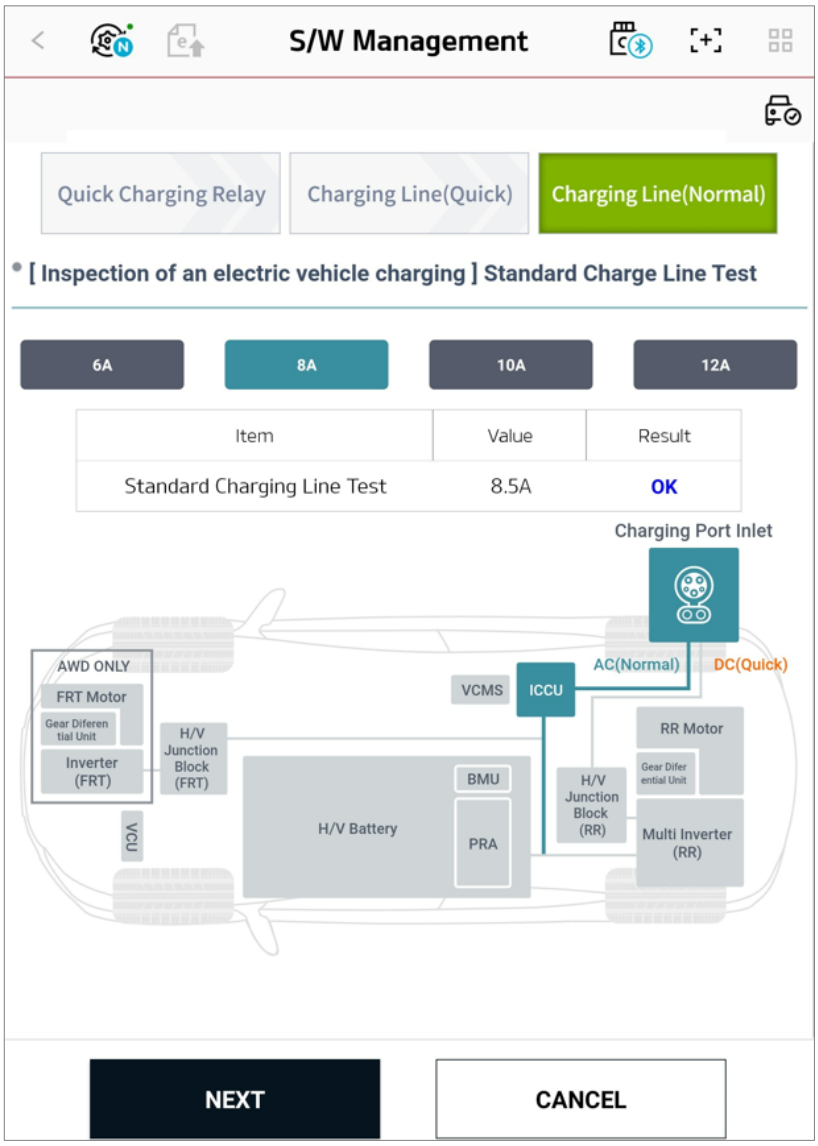
Notification

If the test result is NG, it will receive the breakdown status from the vehicle to indicate the problematic part as red light on the screen, and display the AS response method. (Only the vehicle models after EV9 can operate this function)

Normal charging line test

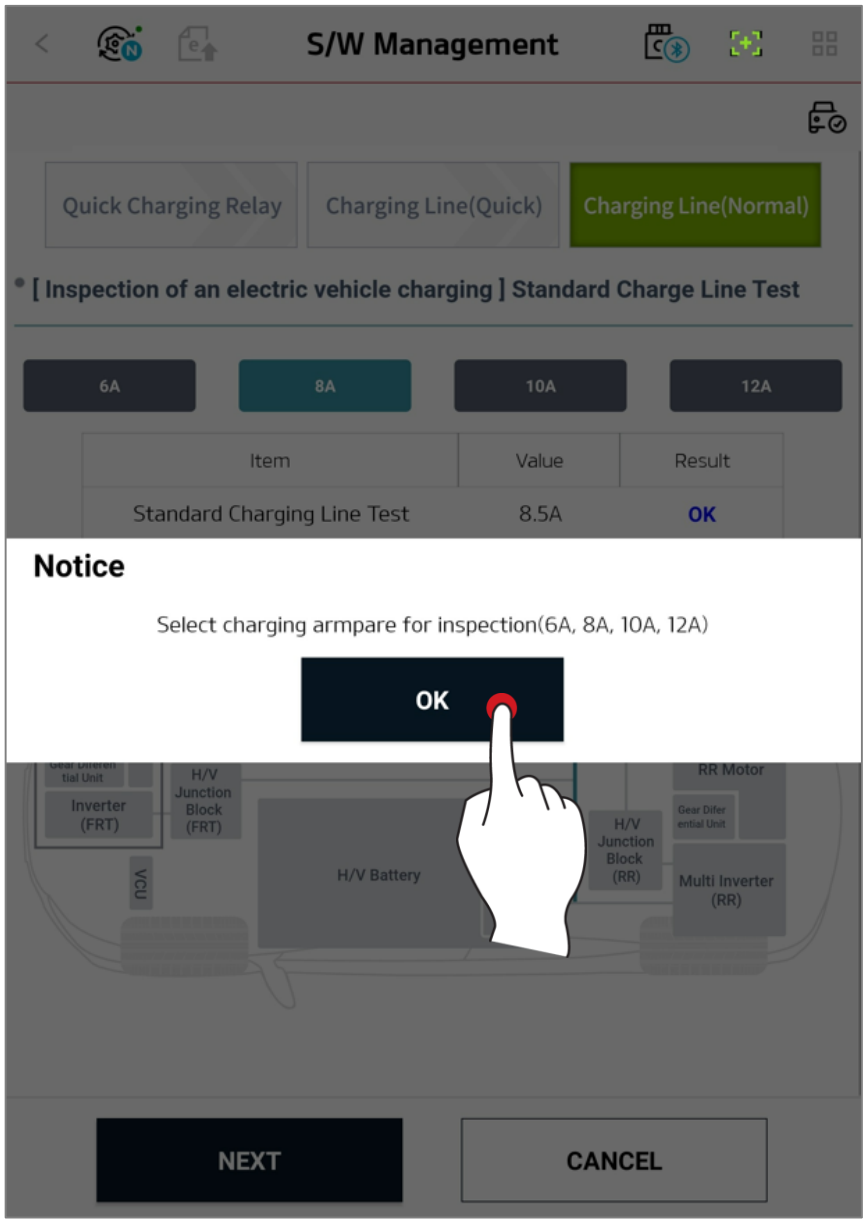
This is a test that checks whether there is abnormality in the normal charging line, which goes through [high-voltage battery -> *ICCU -> charge port] through the path of normal charge port.

* ICCU : Integrated Charging Control Unit



● step 1

When you enter into the function screen, the test will be run with a fixed default value of 8A. Then, the user can change the current value to be measured by touching a desired current value (6, 8, 10, or 12 A) to proceed the measurement. Tab OK button, then select a current value (6, 8, 10, or 12 A) that you want to check.



Determination condition

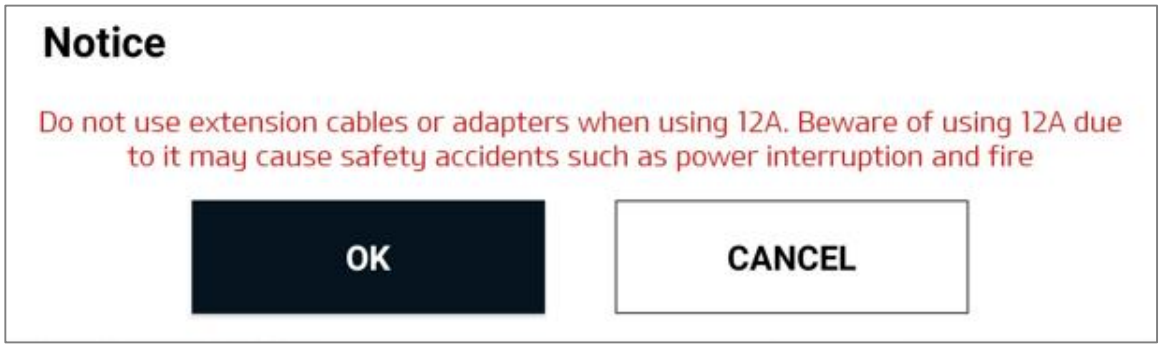
The standard charging will be initiated and the running current value (A) will be measured.

(Error range 15%)

Measured Value	Determination
6A or more	OK
Less than 6A	NG

Notification

In the case of 12 A, using a thin extension cable may lead to causing a safety accident. Thus, the following notification will be shown, and the test will be conducted only when the user approves it.

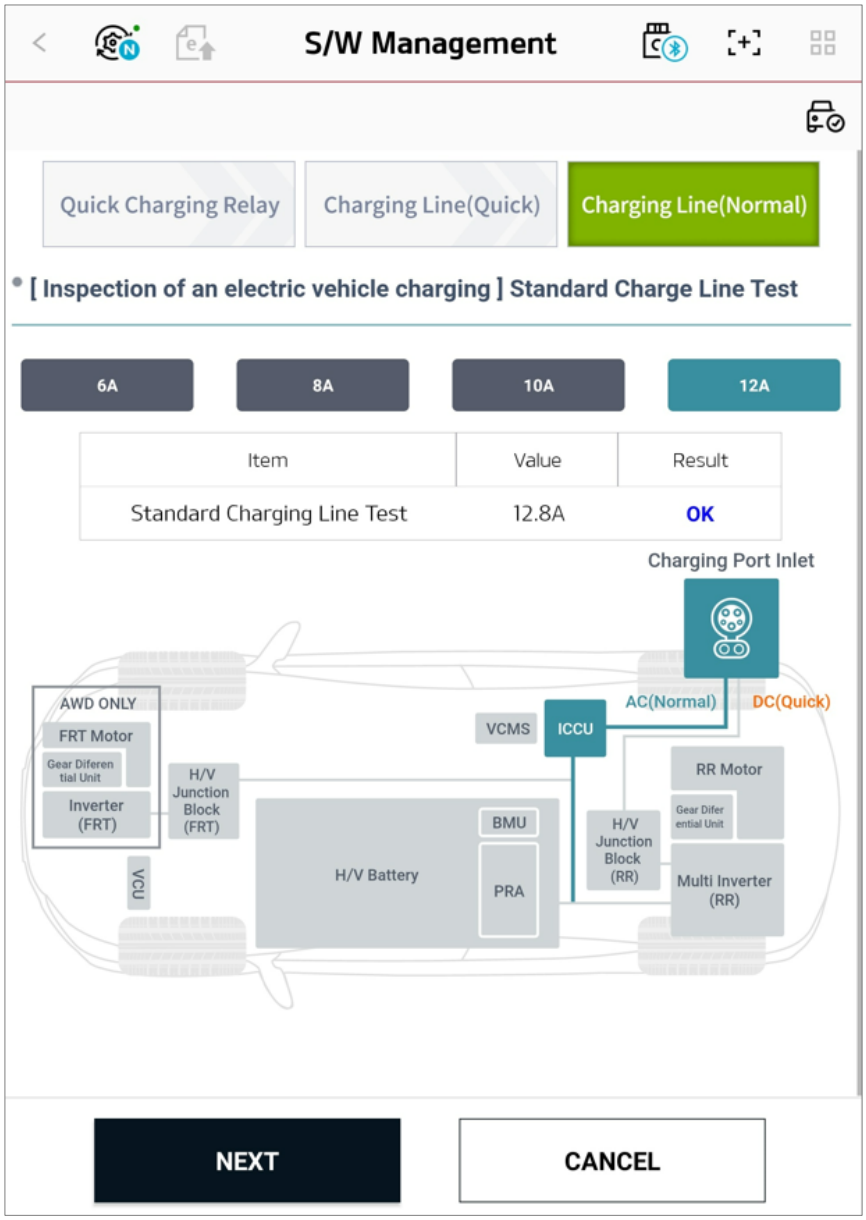


Notification

Battery charging current is adjusted to 90% - 60% depending on the user's charging environment and battery life. (The current values between 3 and 5 A can also be charged)

● step 2

Once the measurement is completed, tab NEXT button to close the test.



Test result

After the test has completed, test results are displayed.