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Chapter 1. Cautions and Warnings

1.1 Copyright Notice and Disclaimer

Cautions and Warnings AA-1-1. Copyright Notice and Disclaimer

Thank you for purchasing G-scan2 supplied by GIT(Global Information Technology) Co., Ltd.
This manual contains information needed for using G-scan2.
We recommend you to read this manual and comprehend the provided functionality before start using G-scan2 in order to get the maximum performance out of the product

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  Even though the product has been extensively tested and evaluated, GIT Co., Ltd. cannot guarantee it will work correctly as intended with every system in every vehicle. GIT Co., Ltd. will do our best to fix any bugs and to bring enhancements to the product, but we specifically disclaim any liability for damage to the car and yourself.

- GIT Co., Ltd. reserves the right to change or modify the content of this instruction manual for both technical and non-technical product enhancement without notice. This may include scan tool graphic displays, vehicle coverage, supported functions and operating procedures. Hardware may also be modified, altered or redesigned or may differ from the descriptions and illustrations displayed in this manual.

- G-scan2 is originally designed not to show the emblems or trademarks of the car manufacturers in the menu in order not to cause infringement of intellectual property rights of the car manufacturers, therefore any attempt to alter or modify its software to show those emblems and trademarks on G-scan's screen is against the policy of GIT Co., Ltd therefore it shall be done at user's own risk and GIT Co, Ltd. shall not be held responsible.

1.2. Introduction to G-scan2

Functionality

G-scan2 is designed to maximize the product efficiency by helping the users fully utilize the diagnostic and measurement functions with the user friendly interface and intuitive operations

Advanced Touch Screen Interface

Touch screen offers easy and intuitive selection of the menu or the desired function right from the screen without the complexity of pressing the buttons

7.0” Color TFT LCD

Large scale 7” TFT LCD ensures readability with striking graphical display and friendly user interface for better presentation of diagnostic information

Expandability through USB interface

Standard USB interface enables the product to host the new diagnostic devices that are going to be developed in the future

Wireless Connectivity (WLAN)

The on-board Wi-Fi module enables the software update through wireless internet connection and use of the network printer for direct printing

Large Capacity SD card

Large capacity the SD card accommodates the diagnostic programs and data, and offers sufficient storage for user’s own database build-up

2100mA Battery

Rechargeable battery enables the use of the measurement functions without external power supply and the diagnostic functions that need engine cranking without a power-cut

1.3. Safety Warnings and Cautions

This section contains warnings and cautions for safe and proper use of this product, therefore it is recommended that every user should read this section carefully before using the product and make sure that such warnings and precautions are well observed and comprehended.

Warning

Dangerous consequences may arise, with the possibility of fire, death or serious injury to the user, if the product is not handled properly as instructed below.
The user shall be fully liable for any direct or consequential damage or loss caused by not following the instructions provided in this G-scan2 user's manual.

- Use G-scan2 only for the original purposes as it was designed for.
- Keep G-scan2 within the specified storage temperature when not in use (See spec sheet)
- Place the G-scan2 at a secured location and keep clearance with any moving part of the vehicle or hazardous environment when using G-scan2 with the vehicle.
- Use only the parts and accessories authorized by GIT.
- Do not disassemble or dismantle the G-scan2 base unit in any case.
  Beware that only the service personnel authorized by GIT is entitled to provide after-sales service for G-scan2.
- Supply stable power from the external source (using AC/DC adapter) when updating G-scan2 software (Operating System, Firmware and Application updates).
  Use the power adapter and cables supplied by GIT only when supplying power from then external source.
- Make secure connections of all cables and connectors. Be careful not to let the DLC cable or power cable gets disconnected while the G-scan2 is operating.
- Observe the instructions of this user's manual when replacing the rechargeable battery.
- Do not use the rechargeable battery other than GIT supplies.
- Do not disassemble the rechargeable battery in any case.
- Do not put the rechargeable battery in the water and keep away from moisture.
- Keep the rechargeable battery from the heat.

- Do not apply physical impact to the rechargeable battery or pierce with a sharp object.
- Do not put the rechargeable battery in the microwave oven or high-voltage container.
- In case any smell, heat, distortion or discoloration is observed with the rechargeable battery, stop using it. If such a symptom is witnessed when charging or operating, remove the battery from the base unit.
- Be careful not to put the rechargeable battery in reversed polarity.
- Do not short-circuit the rechargeable battery terminals.
- Do not connect the rechargeable battery terminals directly with the external power sources.
- Do not put the rechargeable battery in fire or expose it to direct sun light.

Caution

Dangerous consequences may arise, with the possibility of serious injury to the user and or damage to the product, if the equipment is not handheld correctly as instructed below.
The user shall be fully liable for any direct or consequential damage or loss caused by not following the instructions provided in this G-scan2 user's manual.

- Put G-scan2 base unit on a secure place and avoid unstable, inclined or slippery place.
  Be careful not to drop the G-scan2 base unit.
- Avoid humidity and dusts when storing and using G-scan2 in order to prevent electric shock or fire.
- Do not put heavy objects such as hand tools on the G-scan2 base unit.
- Stow the parts and accessories that are not in use in the G-scan2 carry case.
- Avoid following hazards for storing G-scan2.
  - Too high or low temperature (See Spec sheet)
  - Too high or low humidity (See Spec sheet)
  - Exposure to direct sunlight

- Be careful not to cause damages to the cables by heat from the engine or the moving parts in the engine compartment when G-scan2 cable connection is made under the hood.
- Securely tighten the screw lockers when connecting the DLC main cable to the G-scan2 base unit.
- When supplying power from the vehicle battery, check the connection for correct polarity.
- Do not carry the G-scan2 by holding the cables connected to the base unit.
- Avoid physical impart and vibration when carrying G-scan2.

- Do not put the SD card upside down when inserting to the base unit
- Use only the AC/DC adapter that is supplied with G-scan2 when supplying power from AC source

- Storing the rechargeable battery in a hot place may shorten its lifetime
- In case battery liquid gets in the eyes, do not rub and wash them with fresh running water. And see the doctor immediately

- Use the stylus pen supplied as the basic accessory of G-scan2 when touching the screen. Use of sharp or pointed object may cause serious and irrecoverable damage to the touch screen film and the LCD
- Keep LCD away from liquid or splash of water
- Liquid Crystal may run from the broken LCD. Do not touch the LCD when it is broken, and be careful not to get liquid crystal in the eyes or mouth. If contaminated by liquid crystal on the skin, remove them immediately using soap and running water
- Use soft fabric and alcohol to clean the surface of the LCD
- Do not use volatile solvents other than alcohol when cleaning the LCD
- Perform Touch Screen Calibration when the touched point is not coordinated correctly. The touch screen needs zeroing when used for an extensive period of time

1.4. Warnings for environment protection

When the product has been used up to its life-time and needs to be disposed, the rules and regulations that the government of each country has set forth for material recirculation, wasted electric/electronic product disposal or other related legal procedure shall be checked and followed. When disposing the wasted product, please observe the warning message below.

Warning

- When disposing G-scan2, do not dump it among the daily wastes. In many countries, it either shall be approved by local authorities or recollected by the local distributor.
- Disposal by burning or burying it underground without authorization is not generally allowed in most of the countries.
- Contact your local distributor to consult the proper procedure for G-scan2 disposal.

Chapter 2. Getting started with G-scan2

2.1. Specifications

G-scan2 Base Unit

General Specification			
Category	**Specifications**		
CPU	Triple CPU	Main control Board	ARM11@ 600MHz
		Communication Board	ARM9 @ 266MHz
		Measurement Board	ARM9 @ 266MHz
System Memory	Main Control Board: NAND Flash 128MB and SDRAM 256MB Communication Board: NAND Flash 32MB and SDRAM 8MB Measurement Board: NAND Flash 32MB and SDRAM 8MB		
External Memory	16GB SD Card		
LCD	7” TFT LCD (1024 X 600 pixel)		
Input Devices	Touch Screen Power, Enter and Esc keys 4 way directional keys , F1 ~ F6 function keys		
Indication Lamps	3 Color LED		
Sound	Buzzer and speaker		
Rechargeable Battery	Li-Ion Polymer 2100mAh 1cell		
Operating voltage	7 ~ 35V DC (10~35V for charging)		
Housing Material	PC + ABS resin with rubber shrouds		
Dimension	230 X 146 X 72 mm (with VMI pack mounted)		
Weight	Approx. 1300g (with VMI pack mounted)		

Connectivity	
External COM port	1 X USB 2.0 standard (master) + 1 X mini USB (slave)
WiFi Module	On-board
Blue Tooth	On-board

AC / DC Power Adapter	
Input Power	100 ~ 240V AC
Frequency	50 / 60 Hz

VMI Pack (Optional)

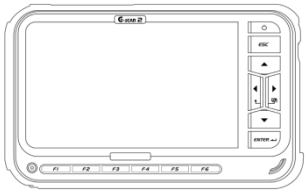
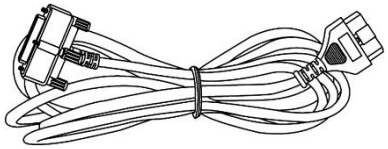
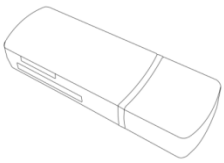
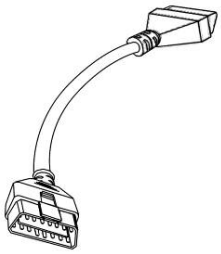
Oscilloscope		
Voltage Division	2 Channel Mode	±400mV, ±800mV, ±2V, ±4V, ±8V, ±20V, ±40V, ±80V, ±200V, ±400V
	4 Channel Mode	±4V, ±8V, ±20V, ±40V, ±80V, ±200V, ±400V
Vertical Resolution	10 bit	
Sampling Mode	Normal / Peak Mode	
AC/DC Coupling	Supported	
Time Division	2 Channel Mode	100 μs, 200 μs, 500 μs, 1 ms, 2 ms, 5 ms, 10 ms, 20 ms, 50 ms, 100 ms, 200 ms, 500 ms, 1s, 2s, 5s
	4 Channel Mode	200 μs, 400 μs, 1 ms, 2 ms, 4 ms, 10 ms, 20 ms, 40 ms, 100 ms, 200 ms, 400 ms, 1s, 2s, 4s

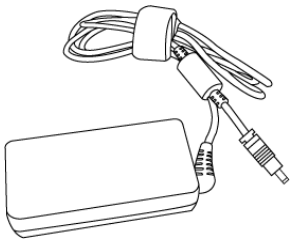
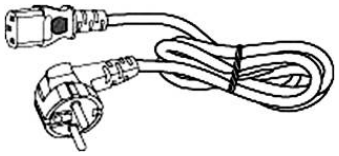
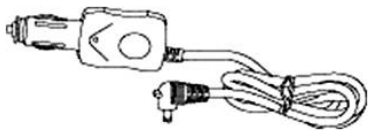
Digital Meter	
Voltage	± 400 mV, ± 4V, ± 40V, ± 400V / Auto Range
Resistance	1Ω ~ 10 MΩ / Auto Range
Frequency	1Hz ~ 10kHz / Threshold level : 2.5±0.5V
Duty Cycle	0.1% ~ 99.9% @ 1Hz ~ 100Hz
	1.0% ~ 99.0% @ 100Hz ~ 1kHz
	3.0% ~ 97.0% @ 1kHz ~ 3kHz
	5.0% ~ 95.0% @ 3kHz ~ 5kHz
	10.0% ~ 90.0% @ 5kHz ~ 10kHz
Pulse Width	10 μs ~ 1,000ms

Simulation		
Voltage Signal Output	0.0 ~ 5.0 V	
Frequency Signal Output	1Hz ~ 999Hz (50% duty)	
Actuator Control	Frequency Range	1Hz ~ 999Hz
	Duty Range	1% ~ 99% @ 1Hz ~ 99Hz
		10% ~ 90% @ 100Hz ~ 999Hz
	Pulse Width	Variable

2.2. Parts and Components

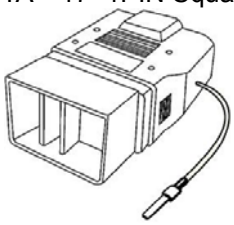
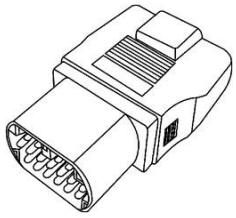
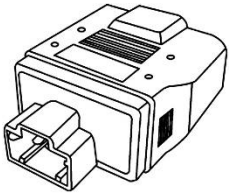
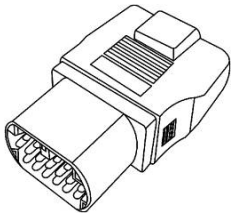
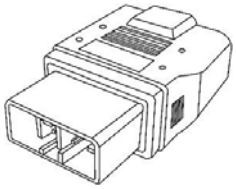
Basic Supplies

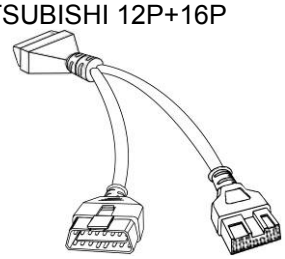
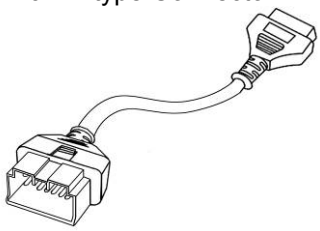
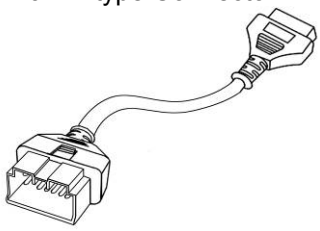
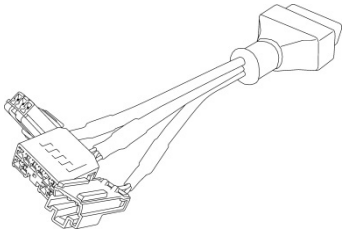
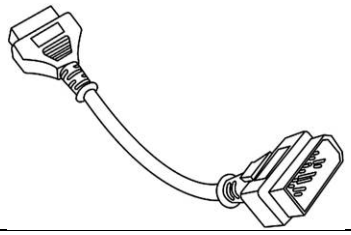
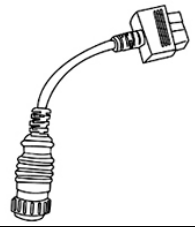
Part	Part Number	Description	Q'ty
	G1FDDMN029 (Blue) G1FDDMN020 (Black)	**Part Name: G-scan2 Base Unit** G-scan2 base unit with VMI module Includes the battery and SD Card	1
	A2MDT2SD16G	**Part Name: SD Card 16GB** Provided included in the base unit. A memory card that contains software and data for diagnostic functions.	1
	G1FZFCA001	**Part Name: Cable – DLC Main Cable** The main cabled used for connecting the G-scan2 base unit and the car's OBD2 connector.	1
	A2MDK1CCRP5	**Part Name: SD Card Reader** A USB card reader used for connecting the SD Card to the PC. (Specs can be changed without notice)	1
	G1CDDPA008	**Part Name: Self Test Adapter** A cable used for self test of G-scan2 base unit and the cable connection. Do not use this cable for vehicle diagnostic functions	1
	G1PZGDP001	**Part Name: PC Utility CD (S/W)** A CD that contains the G-scan2 PC utility installation program and soft copy of user's guide.	1

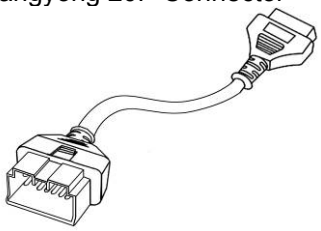
	G1FZDHA001	**Part Name: Carrying Hard Case** A portable and heavy duty hard case that contains G-scan2 base unit and parts.	1
	G1CDDPA013	**Part Name: AC/DC Adapter** AC to DC converter used for supply of AC power to the G-scan2 base unit.	1
	G1CDECA001 (Europe, Korea) G0PDDCN001 (Australia) G0PDDCN002 (UK, Malaysia) G1PDDCA002 (North America)	**Part Name: AC Power Cord** AC power cord used with the AC/DC adapter for supply of AC power to G-scan2 base unit Different type AC plugs may apply for different countries i.e. Korea, USA. Australia and UK. Spec: IEC 60320 C13	1
	G2SDDCA003	**Part Name: Cable – Battery** A power supply cable used together with the Cigarette Lighter Cable when supplying power from the car's battery.	1
	G1PDDCA002	**Part Name: Cable-Cigarette Lighter** A power supply cable used when supplying power from the car's cigarette lighter socket.	1
	G1FZTZM001	**Quick Manual** A single piece laminated paper manual for quick guidance for G-scan2 usage.	

Non-standard OBD Adapters Asian Vehicles

Parts included in the Asian and Full Kit (Not included in Standard Kit)

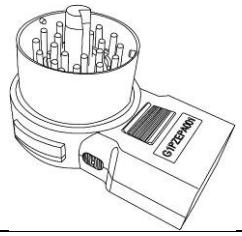
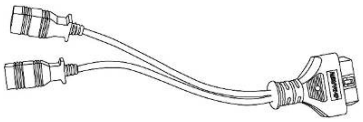
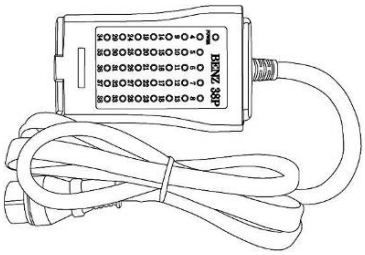
Part	Part Number	Description	Q'ty
TOYOTA 17+1PIN Square 	G1PZDPA001	Used for communication with old Toyota and Lexus cars with 17+1 pin "Square (rectangular)" type diagnostic connector in the engine compartment.	1
TOYOTA 17P Round 	G1PZFPA002	Used for communication with old Toyota and Lexus cars with the 17-pin "Round (Semi-circular)" type diagnostic connector. Same appearance as the Mazda 17P adapter, make sure to check the name engraved on the surface.	1
HONDA/ACCURA 3P 	G1PZFPA003	Used for communication with old Honda and Acura cars with the 3-pin or 5-pin diagnostic connector.	1
MAZDA 17P 	G1PZFPA004	Used for communication with old Mazda models. Same appearance as the Toyota 17P R adapter, make sure to check the name engraved on the surface.	1
SUBARU 9P 	G1PZFPA005	Used for communication with old Subaru cars with the 9-pin diagnostic connector. (Can be excluded from the Asian kit due to regional preferences)	1

MITSUBISHI 12P+16P 	G1PZDPA002	Used for communication with old Mitsubishi or Hyundai cars with the 12-pin single or 12+16pin dual diagnostic connector.	1
Kia 20P-A type Connector 	G1FDDPA001	Used for communication with old Kia cars with 20 pin diagnostic connector in the engine compartment. Generally used for '99 ~ '02 MY cars.	1
Kia 20P-B type Connector 	G1FDDPA002	Used for communication with old Kia cars with 20 pin diagnostic connector in the engine compartment. Generally used for '03 ~ '05 MY cars.	1
Hyundai & Kia Keyless Connector 	G1CDDPA007	Used for some old Hyundai and Kia models that require special connector for keyless entry remote control coding	1
NISSAN 14P 	G1PZFPA007	Used for communication with old Nissan or Infiniti cars with the 14-pin diagnostic connector.	1
Ssangyong 14P Connector 	G2WDDCN006	Used for communication with old Ssangyong cars with 14 pin circular diagnostic connector in the engine compartment (Can be excluded from the Asian kit due to regional preferences)	1

Ssangyong 20P Connector 	G2WDDCN007	Used for communication with old Ssangyong cars with 20 pin square diagnostic connector in the engine compartment (Can be excluded from the Asian kit due to regional preferences)	1
Daewoo 12P Connector 	G2WDDCN008	Used for communication with old Daewoo cars with 12 pin diagnostic connector (Can be excluded from the Asian kit due to regional preferences)	1

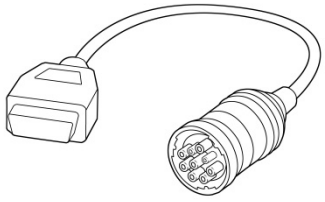
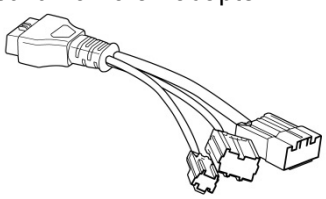
Optional European Car OBD Adapters

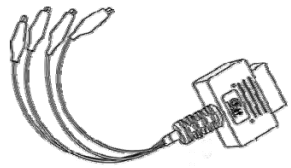
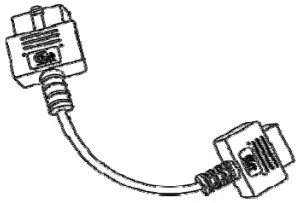
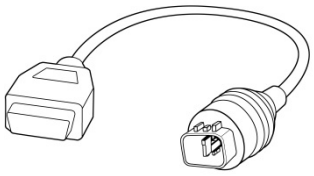
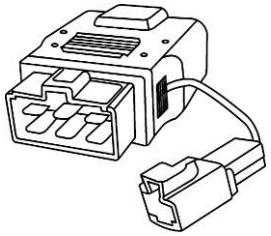
Parts included in the Full Kit (Not included in Standard and Asian Kit)

BMW 20P 	G1PZEPA001	Used for communication with old BMW cars with the 20-pin circular diagnostic connector.	1
AUDI / VW 4P 	G1PZEPA002	Used for communication with old Volkswagen, Audi, Seat or Skoda cars with the 2 X 2 pin diagnostic connector.	1
BENZ 38P 	G1PZEPA012	Used for communication with old Mercedes Benz cars with the 38-pin circular diagnostic connector in the engine compartment. (Can be excluded from the full kit and replaced with the other optional adapters due to regional preferences)	1

Optional Diagnostic Adapters for Commercial Vehicles and Rare Models

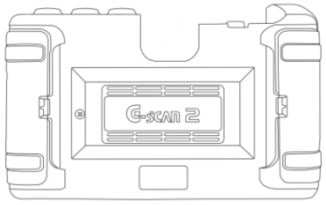
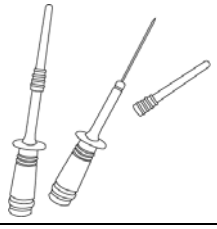
Parts available as optional supply

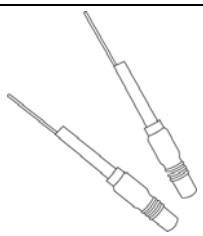
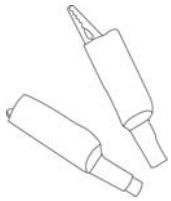
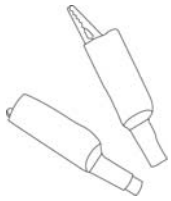
J1939 9-P adapter 	G1PZDPA005	Used for generic communication with SAE J1939 compatible commercial vehicles	1
Isuzu 20-10-3P adapter 	G1PZDPA006	Used for communication with old type Isuzu commercial vehicles	1

Universal Adapter 	G2WDDCN010	Used for communication with the vehicles that are fitted with non-standard OBD adapters that G-scan's standard kit adapters are not compatible	1
Hyundai Commercial 16-pin 	G2SDDCA029	Used for most Hyundai and Kia commercial vehicles. Similar to standard OBD2 connector, but the internal wirings are different. Colored light grey for recognition	1
Hyundai Commercial 4-P CNG 	G1GDDPA001	4-pin circular connector used specifically for Hyundai CNG (Compressed Natural Gas) buses	1
Kia 6P Connector 	G1CDDPA005	Used for communication with old Kia cars with 6 pin diagnostic connector in the engine compartment. (Can be excluded from the Asian kit due to regional preferences)	1

Basic components for Measurement Functions

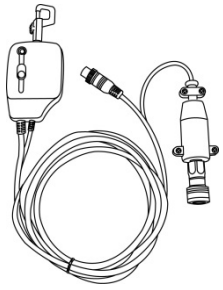
Parts supplied with the G-scan2 for measurement functions

	G1FDDMN006	VMI Pack Detachable rear module that enables G-scan2's oscilloscope, meter and simulation functions. Part of G-scan2 base unit, not sold separately. Includes rechargeable battery.	1
	G1FDDCA002	Ground Cable Used for independent grounding of the VMI circuit for stable and accurate measurement	1
	G1MTKCA002	Channel A Probe (Red) Connected to the red Channel A port of the VMI, used for acquiring electric signal from the wires or terminals.	1
	G1MTKCA003	Channel B Probe (Yellow) Connected to the yellow Channel B port of the VMI, used for acquiring electric signal from the wires or terminals	1
	G1SDDCN005	Scope Pins (Red)	2
	G1SDDCN005 (Part number shared)	Scope Pins (Black)	2

	G1SDDCN005 (Part number shared)	Spring Pin	2
	G1SDDCN005 (Part number shared)	Scope Clip (Red)	2
	G1SDDCN005 (Part number shared)	Scope Clip (Black)	2

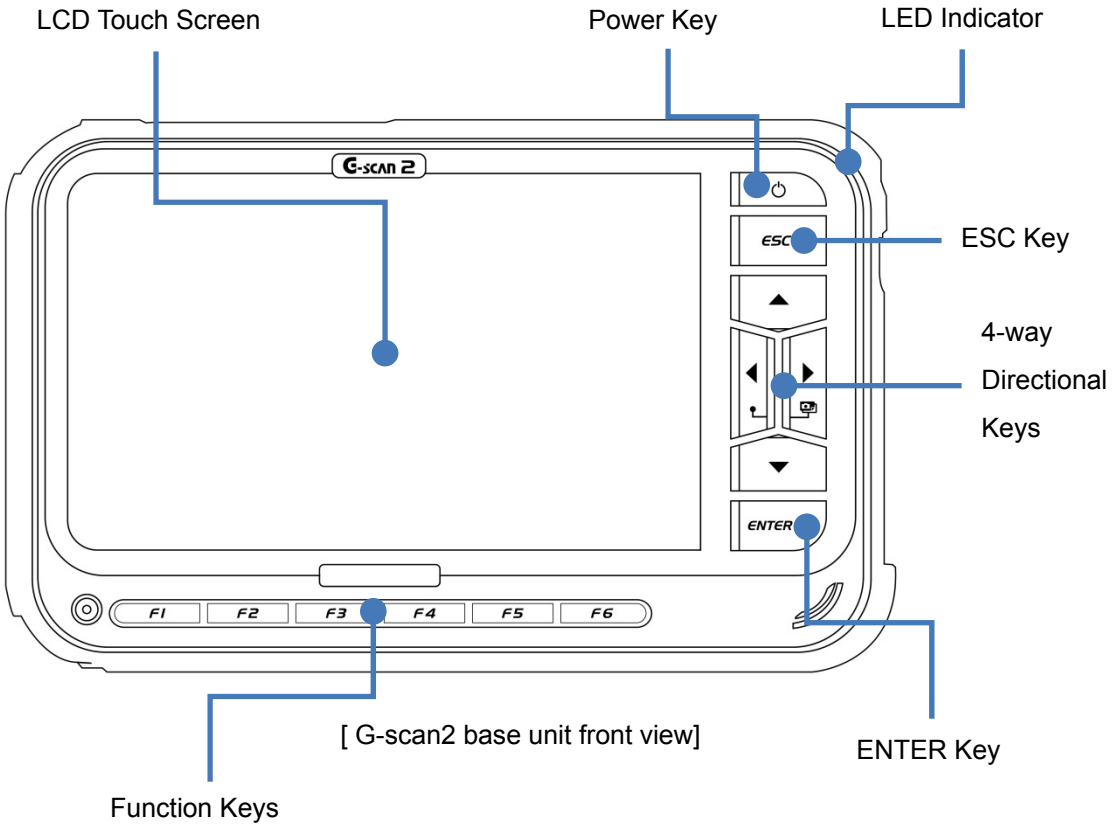
Optional components for Measurement Functions

Parts available as optional supplies

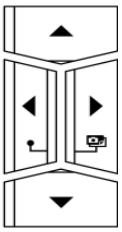
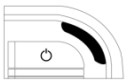
	G1GDKCA003	Current Clamp, small current Used for measurement of small current of up to 20A	
	G1GDKCA004	Current Clamp, large current Used for measurement of large current of up to 100A or 1000A (switchable)	
	G1GDKCA006	Pressure Sensor Used for measurement of pressure	

2.3. Details of the base unit

Touch Screen and Input Buttons



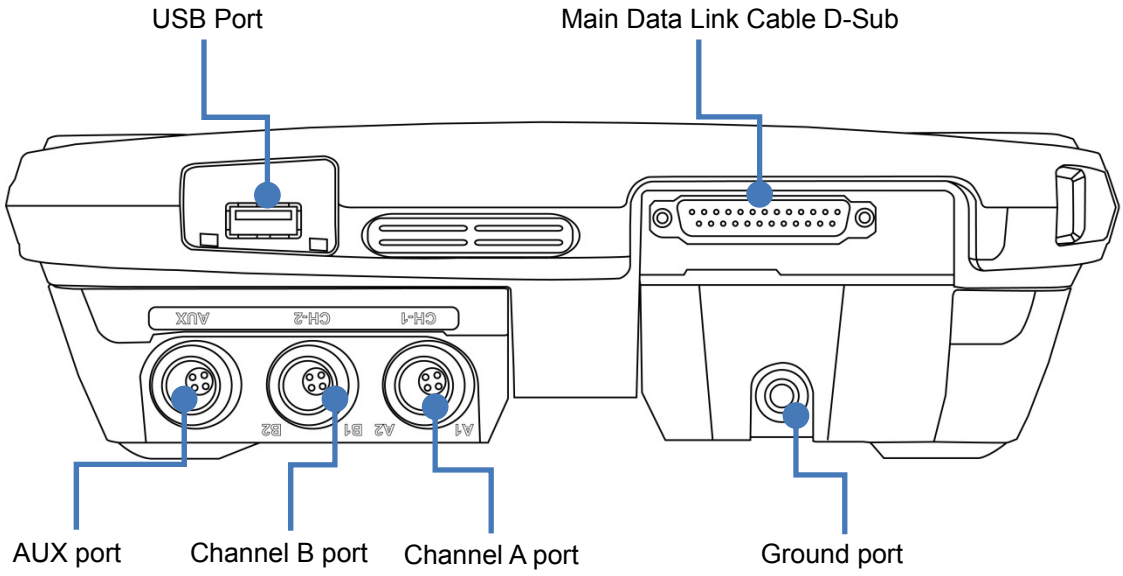
[G-scan2 base unit front view]

Part Name	Function
Touch Screen	Menu items, graphic buttons or icons are selected by directly touching the screen
	Different functions are assigned to the buttons, and the selected function runs when pressed
	Turns G-scan2 power On /Off 1) ON: Keep pressing the button for 0.5 seconds or more 2) OFF: Hold down the button for 1 ~ 2 seconds 3) A short press of the button, for less than 0.5 seconds while G-scan2 is turned on, puts G-scan2 into the "Standby Mode"
	Returns to the previous step or aborts the currently running function
	Moves the cursor up, down, left or right to select the item or function in the menu Pressing the Left and Right keys at the same time works as the hot key for the screen capture.
	Confirms the selection or executes the selected function
	Indicates the power charging status of G-scan2. RED: Charging, Green: Fully Charged, Blue: Stand-by Mode

LED Indicator Signal

Power Source	When charging	When fully charged
AC/DC adapter	Red LED ON	Green LED ON
DLC cable	Red LED ON	Green LED ON
Internal Battery	Red LED ON	Green LED ON

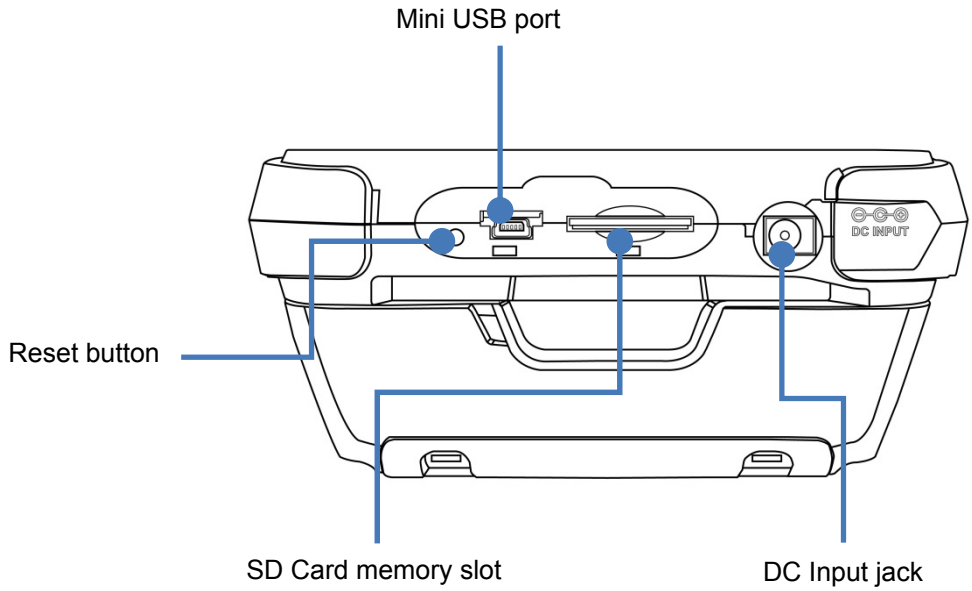
G-scan2 Hardware Configuration – Top



[G-scan2 base unit top view]

Part Name	Description
DLC D-sub	Main Data Link Cable is connected
USB port	Standard USB cable is connected
Ground port (Green)	Ground cable is connected for the measurement functions
Channel A (CH-A) port (Red)	CH-A oscilloscope probe cable is connected for the measurement functions
Channel B (CH-B) port (Yellow)	CH-B oscilloscope probe cable or the pressure sensor is connected for the measurement functions
AUX port (Blue)	Current sensor, Small or large, is connected for the measurement functions

G-scan2 Hardware Configuration – Side



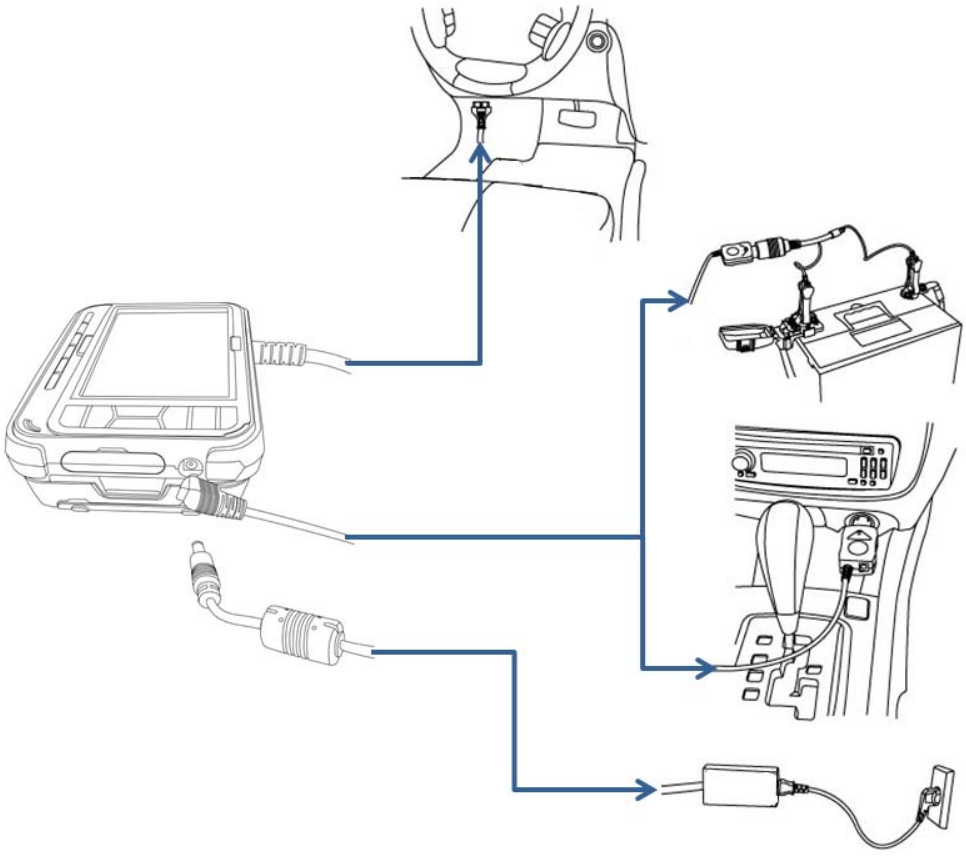
[G-scan2 base unit side view]

Part name	Description
Reset button	Resets G-scan2 by force in case the system is unable to shut down normally due to the software failure caused by O/S defect or others
Mini USB port	Mini-USB cable is connected
SD Card memory slot	Accommodates the SD Card
DC input jack	AC/DC Adapter or Cigarette Lighter Cable is connected for the supply of external power to G-scan2

2.4. Power Supply to G-scan2

Power supply to G-scan2 is available from 4 different sources.

- from diagnostic connector
- from cigarette lighter socket
- from vehicle battery
- from AC outlet (through AC/DC adapter)



[Delivery of power to G-scan2]

from the diagnostic adapter

1. Extend the G-scan2 main cable to the vehicle side diagnostic socket. Attach the paring OBD non-standard connector if necessary.
2. Turn the ignition key to ACC or ON position, and power is supplied to G-scan2.
   The power is supplied through the diagnostic socket even when the IG key is turned OFF. However, please note that the IG key must be turned ON for diagnostic communication.
3. By the industrial standard, all OBD-2 / EOMB compliant vehicles are designed to supply power through the diagnostic adapter.
4. The vehicle side DLC socket is recommended to be placed within 1 meter from the driver's seat. It is generally found under the dashboard. However, be reminded that there are exceptions.

from the cigarette lighter socket

1. Connect the cigarette lighter power cable to G-scan2's DC input jack.
2. Extend the cable and insert the connector to the vehicle side cigarette lighter socket
3. Turn the ignition key to ACC or ON position, and power is supplied to G-scan.
   In case of drawing power from the cigarette lighter socket, the power is lost when cranking the engine causing G-scan2 to turn off if the internal battery is discharged or not installed. It is recommended to use the other power source if rechargeable battery is not charged or the battery pack is not installed to G-scan2

from the vehicle battery

1. Connect the cigarette lighter power cable to G-scan2's DC input jack.
2. Attach the battery cable with the alligator clips to the end of the cigarette lighter power cable.
3. Beware of the battery polarity, and extend the red clip to the (+) terminal of the vehicle battery and the black one to the (-) terminal.
4. Turn the ignition key to ACC or ON position, and power is supplied to G-scan2.

Caution

Never connect the battery cable clips to the reversed polarity terminals.
It may cause serious damage to G-scan2.

from AC outlet

1. Connect the DC jack of the AC/DC converter to G-scan2's DC input jack.
2. Extend the AC plug of the AC/DC converter to the AC outlet.
3. Power is supplied to G-scan2

Caution

Make sure to use the AC/DC adapter that is supplied with G-scan2.

Damage caused from use of unapproved AC/DC adapter is not subject to warranty service.

Turning G-scan2 ON

Hold down the POWER button for about 0.5 seconds to turn the G-scan2 on.

The LED indicator illuminates in blue which goes off shortly after, then the G-scan2 booting sequence is initiated. The booting sequence is followed by the main menu display.

Turning G-scan2 OFF

Hold down the POWER button for about 2 seconds to turn the G-scan2 off.

"The system is shutting down" message appears on the screen, the LED indicator shortly illuminates in blue, then the G-scan2 is powered off completely.

Switching G-scan2 to Standby mode

A stand-by mode query pops up when the POWER button is pressed shortly as shown below:

Wait until the timer counts down to zero, then the G-scan2 switches to "Standby mode". In Standby mode, G-scan2 hibernates until any key is pressed. Upon any key stroke or a screen touch, it resumes normal operation instantly without going through the boot-up sequence.

Select "Power OFF" to turn the G-scan2 off completely.

In case of unintended stroke of POWER button or pressed by accident, select "Cancel".

2.5. Rechargeable Battery

G-scan2 is fitted with the Li-Ion rechargeable battery pack as the basic supply, and it enables the device to run normally when the external power supply is lost. However, drawing power from the car is always recommended for diagnostic communication stability.

1. Connect DC jack of the AC/DC adapter to G-scan2's DC input jack.
2. Extend the adapter plug of the AC/DC adapter to the AC outlet.
3. LED indicator illuminates in red when charging the battery. When fully charged, the LED turns to green.

Charging	**Fully Charged**
Red LED On	Green LED On

Warning

Frequently check the battery indicator icon on the corner of the screen when operating G-scan2 on its battery without an external power source.

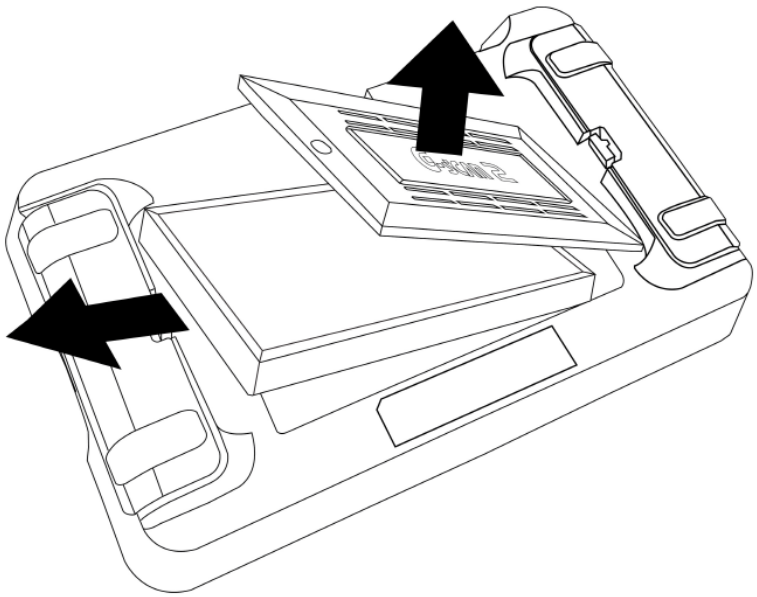
Recharge the battery immediately by supplying external power when the battery status appears low; otherwise G-scan2 will turn off automatically.

Rechargeable Battery Replacement

A rechargeable battery is an expendable supply of which performance deteriorates over the repeated recharging cycles, and the replacement of the battery is recommended when the lowered charging performance is experienced.

Open the rear battery cover and lift the battery to remove.

Insert the new battery in place and close the cover.

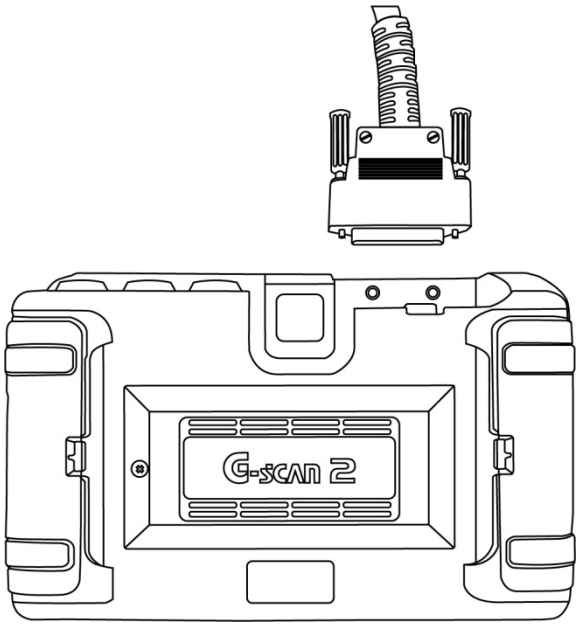


[Rechargeable Battery Replacement]

2.6. Connecting to the vehicle

Connecting the main DLC cable to the base unit

Connect the DLC main cable to the G-scan2 D-sub connector, and secure the connection by fastening the 2 main screws as well as the 2 vertical screws. Do not apply excessive power when fastening the screws.



Warning

Do not hold the G-scan2 base unit by the main cable when carrying the product. Make sure to hold the base unit or the hand strap

Connecting to the Vehicle

Extend the DLC main cable connected to the G-scan2 to the vehicle side DLC socket.

Different types of diagnostic adapter may be used for the old models or the commercial vehicles. If the vehicle is not OBD2 / EOBD compliant, identify and attach the matching adapter, then connect it to the vehicle side socket.

2.7. Rear Pack Replacement

G-scan2 rear pack replacement

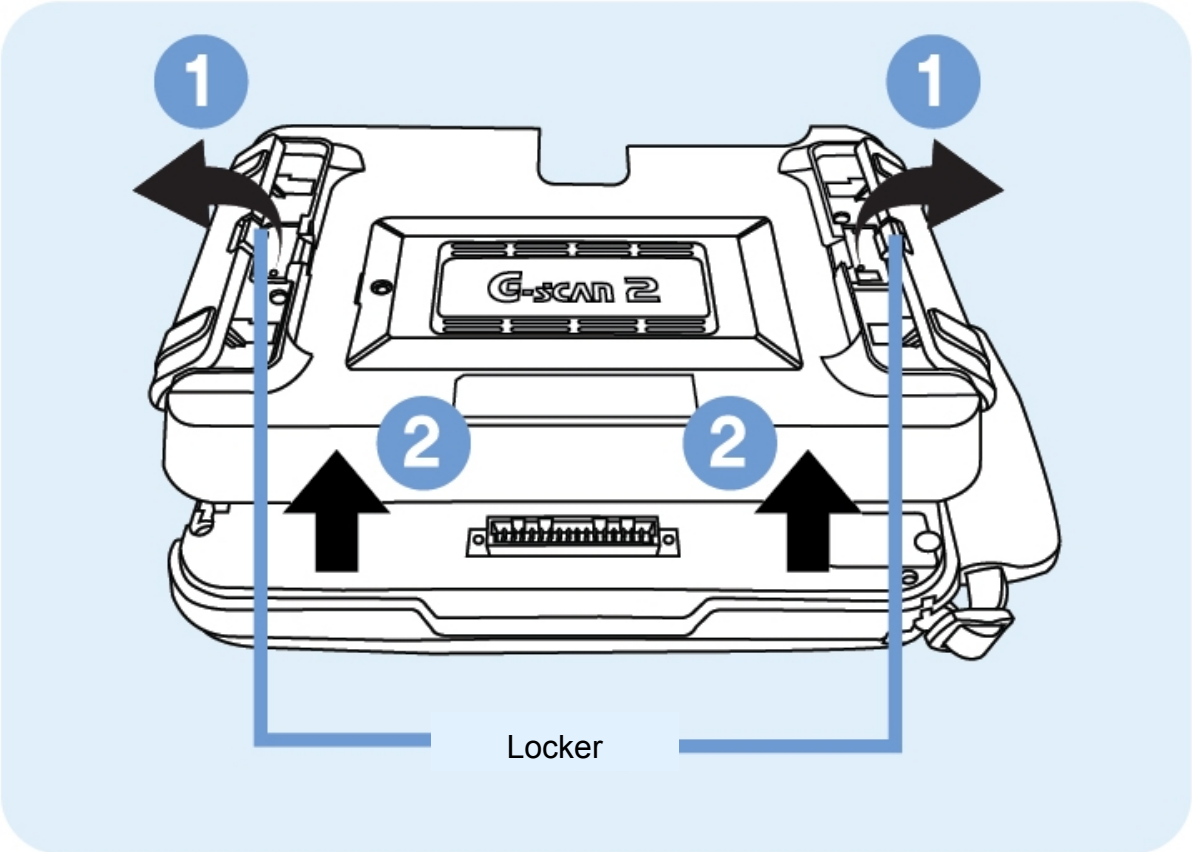
G-scan2 is supplied with the VMI rear pack which offers the measurement capability including oscilloscope, digital multi-meter and simulation functions.

1. Detaching

   Unlock the lockers on both sides by pressing them sideways

   Swing open the locker hinges, then the rear pack is released

   Detach the rear pack from the base unit by lifting gently



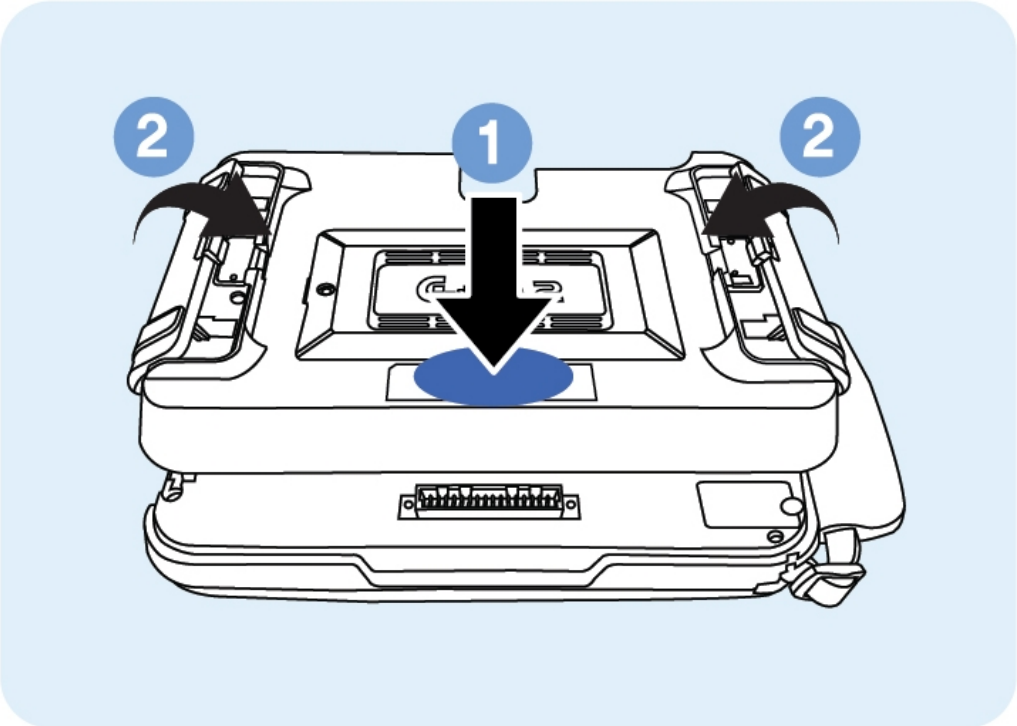
[Rear pack removal]

2. Mounting

   Put the rear pack well aligned in place

   Lock the rear pack to the base unit by gently pressing down the center part

   Swing close the locking hinges on both sides.



[Rear pack mounting]

Chapter 3 G-scan2 Basic Operations

3.1. Main Menu and System Tools

The main menu as shown below appears when G-scan 2 is turned on.
Please refer to the information about the main menu items and functions provided in this chapter for further usage of G-scan2 product.

Main menu

The main menu of G-scan2 is consisted of 4 sections (header, additional functions, major functions and bottom).

[4 sections of main menu]

Main menu - Header

The header carries different type of information and indicators according to the selected functions.

Icon	Name	Description
	Battery Status	Indicates the battery charging status * A rechargeable battery is an expendable supply of which performance deteriorates over repeated recharging cycles.  : Charging  : Fully charged,  : Battery balance (while running on the battery power).
	Volume	Level of speaker volume (loudness). Switching off the speaker is possible from the configuration menu.
	WiFi Status	Indicates the WiFi (WLAN) connection status
12:00 AM	time	Indicates the system time
13 Jul 2013	Date	Indicates the system date
	Screen Capture	Captures the current screen and saves to the SD card memory.
	Previous	Moves back to the previous step
	Home	Jumps to the Main Menu

Main Functions

[Main Functions]

Icon	Title	Description
	Recorded Data	Retrieves data files recorded in the SD card, including flight record data, saved oscilloscope waveforms and screen captures
	OBD-II	Performs Generic OBD2/EOBD diagnostic functions for the ISO9141-2, ISO14230 (KWP2000) and ISO15765-4 (CAN-Bus) compliant vehicles.
	Diagnosis	Runs manufacturer specific diagnostic functions including DTC Analysis, Data Analysis, Actuation Test, ECU Info and various Special Functions for each car manufacturer.
	Measurement	Executes the vehicle measurement features including oscilloscope, digital multi-meter and simulation functions.
	Favorite	Opens the favorite functions folder where the frequently used functions are listed and organized by the user. The listed functions can be revisited simply without having to navigate the multiple menu layers each time.

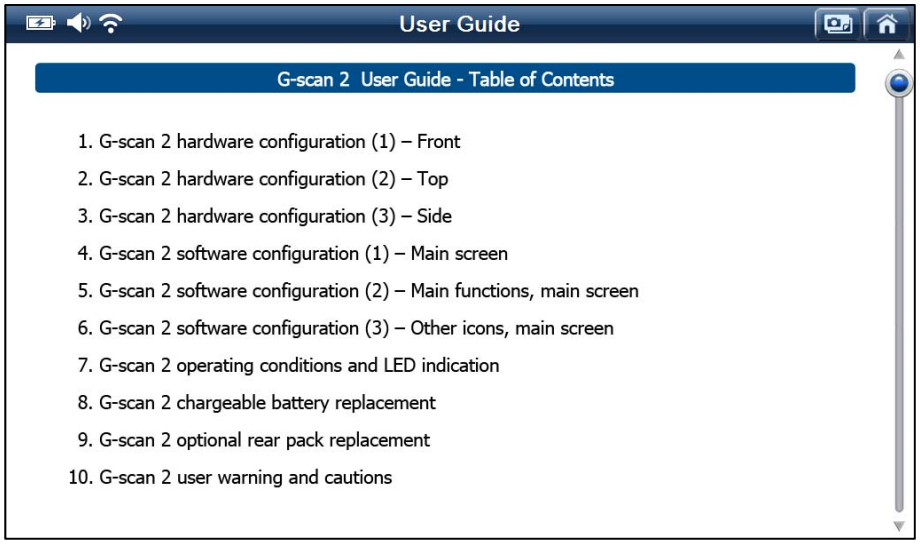
Additional Function Section

Includes the icons of the additional functions that can be directly selected from the main menu, including Quick User Guide, Configuration, and Utility.

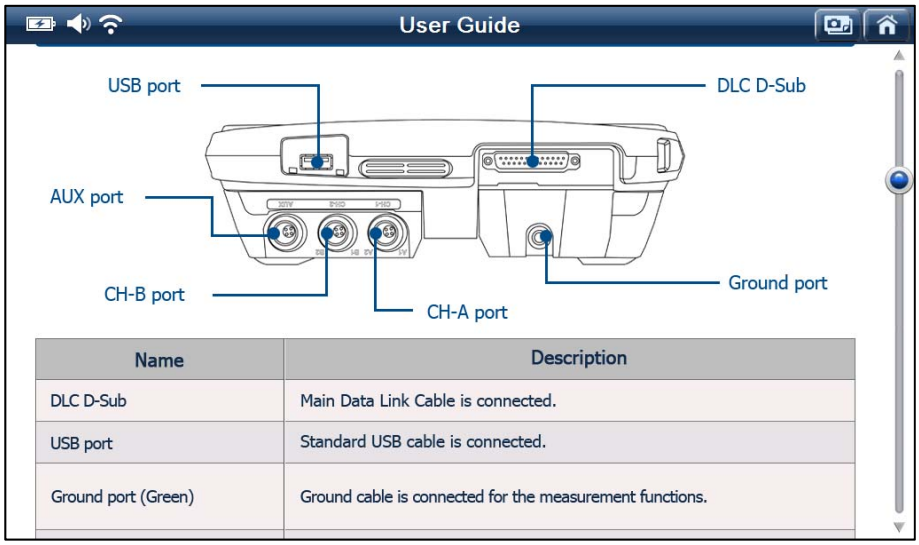
Icon	Name	Description
	Quick User Guide	Opens the Quick User Guide, where the simplified user's manual can be viewed. Refer to the user's manual included in the PC Utility program for more details.
	Configuration	Opens the configuration menu where software version information check, date and time set, language selection and various user settings can be reviewed and changed.
	Utility	Calls the various utility programs such as "Vehicle Communication Line Check", "Unit Converter", "Calculator", "Special Function Calculator", etc.

1. Quick User Guide

Select "Quick User Guide" from the G-scan 2 main menu among the Additional Functions icons to view the simplified user's manual for quick reference.



[Quick User Guide – Index]



Name	Description
DLC D-Sub	Main Data Link Cable is connected.
USB port	Standard USB cable is connected.
Ground port (Green)	Ground cable is connected for the measurement functions.

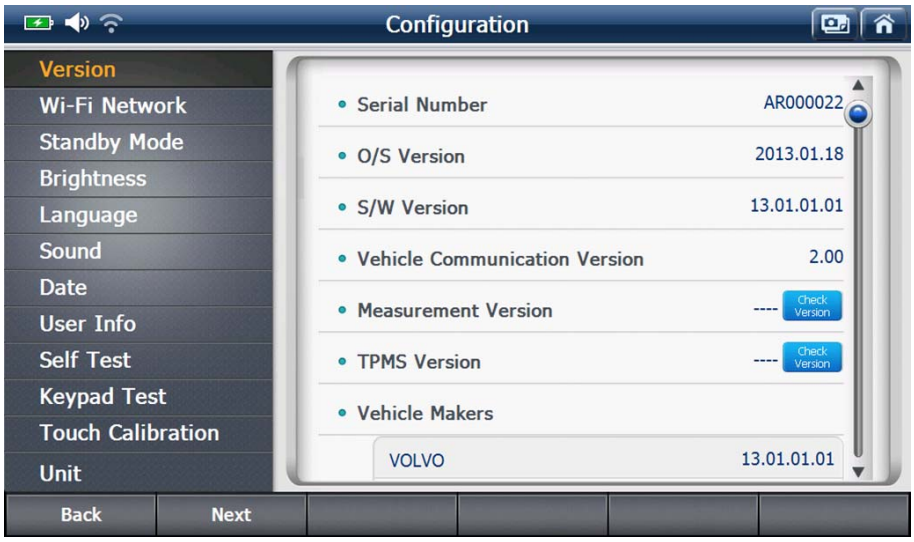
[Quick User Guide – Main Body]

2. Configuration

Select the “Configuration” among the Additional Functions icons to check the software versions, set up the WiFi connection, perform the self-test, keypad test or touch screen calibration, or change the various user settings such as stand-by mode, brightness, sound, user information.

2-1. Software version

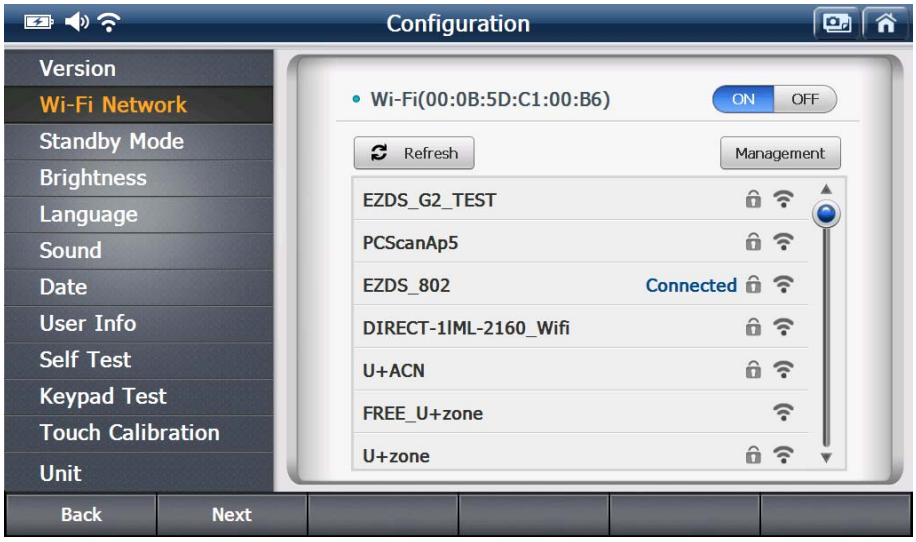
The G-scan2 serial number and the version numbers of operating system and the individual diagnostic programs can be checked.



[G-scan 2 Configuration – Software Version]

2-2. Wireless Network

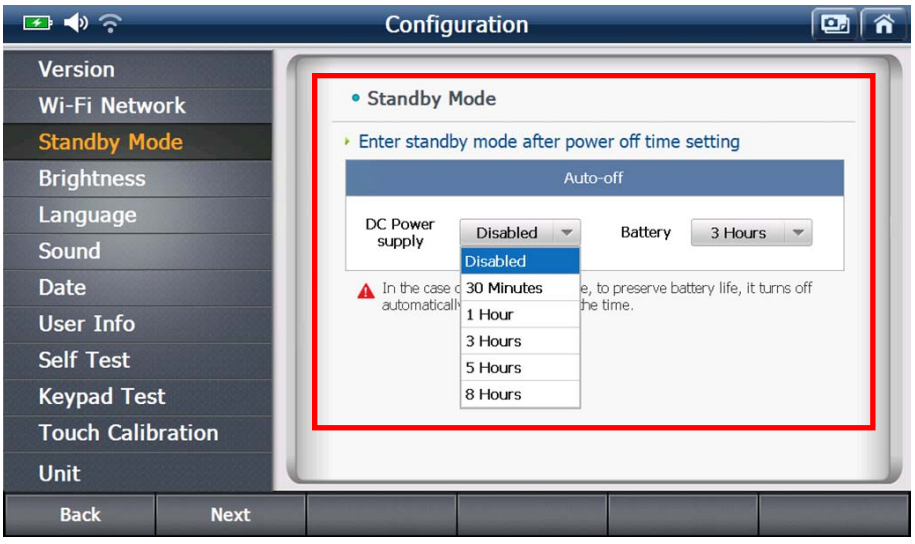
Wireless network status can be checked. The Wireless network setup can be carried out from the PC Utility's Configuration menu.



[G-scan 2 Configuration - Wireless Network Status]

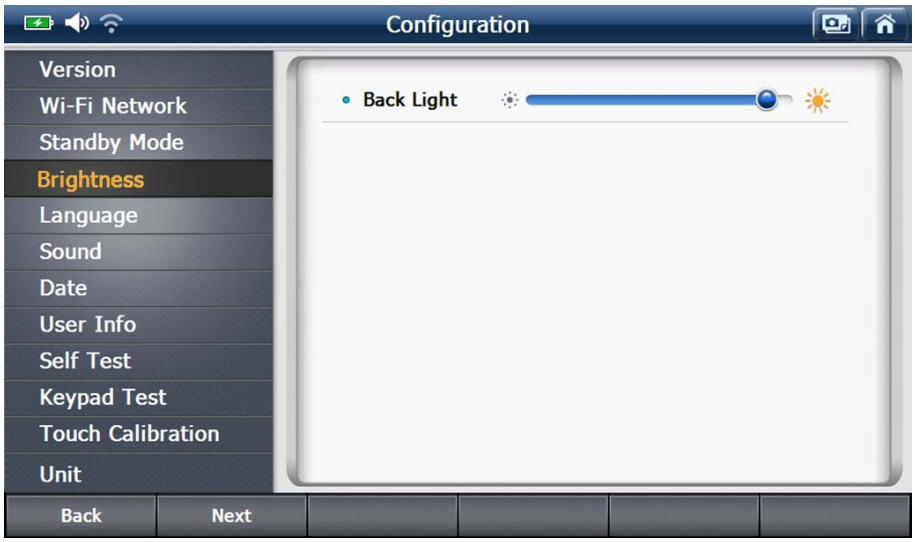
2-3. Stand-by mode setting

Automatic power off while G-scan2 is hibernating in stand-by mode can be selected from the drop down menu either when powered by the DC Power input or the internal battery.



2-4. LCD Brightness Control

Brightness of the LCD Backlight can be adjusted



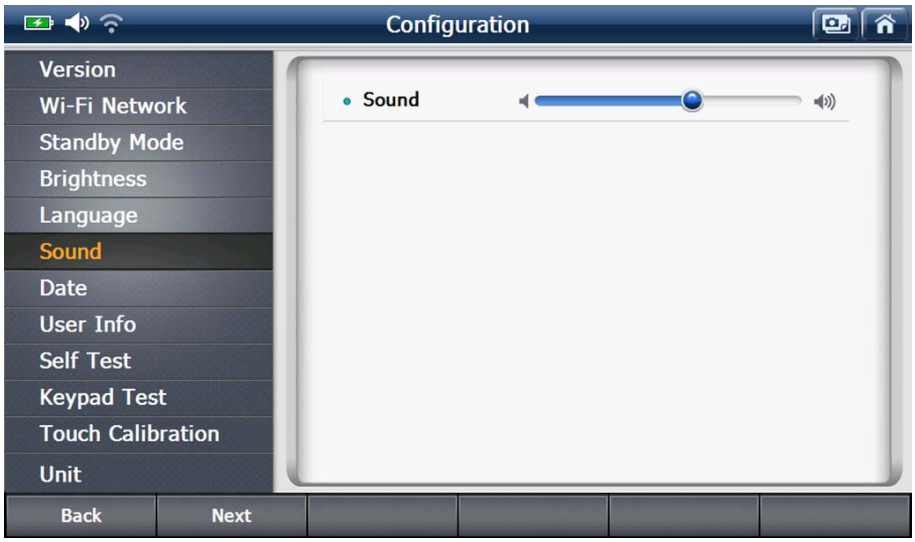
2-5. Language

Select the preferred language among the supported languages (if available). The languages are supported in different set by the regions. Generally English is the primary language with the different local languages supported as the secondary.

2-6. Sound

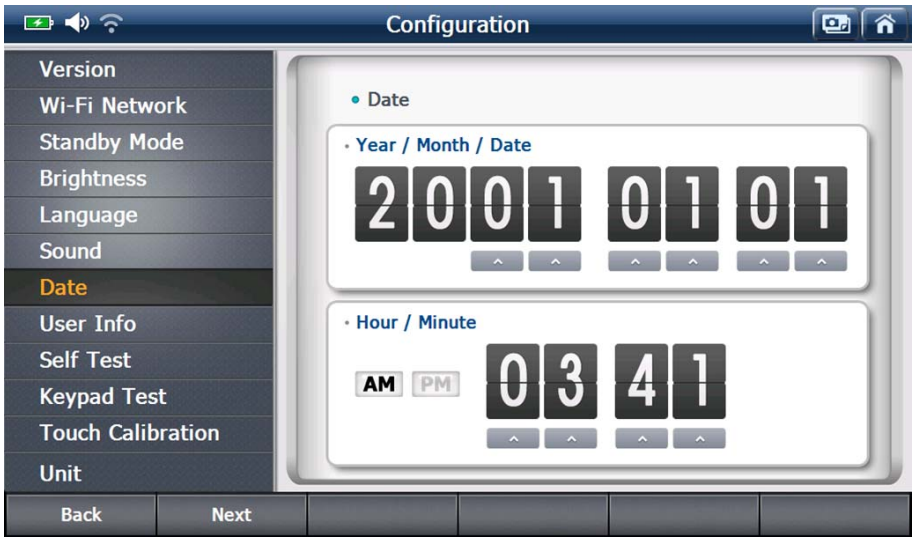
The loudness of the sound that G-scan2 internal speaker can be adjusted.

The speaker turns to mute when adjusted to the lowest level.



2-7. Date

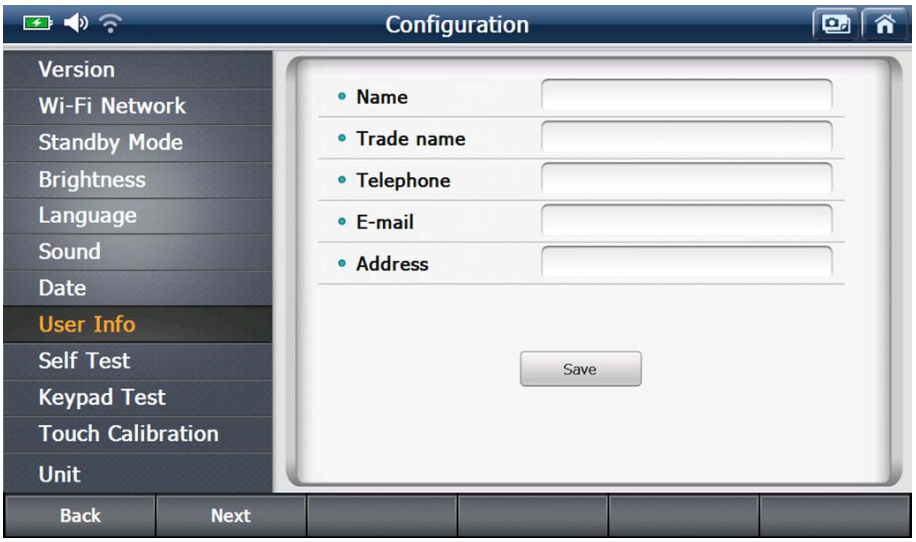
The date and time that are applied while using G-scan2 can be set and adjusted.



2-8. User Information

G-scan2 user information can be reviewed.

. The user information can be inputted or revised from the PC Utility's Configuration menu.



2-9. Self-test

In case the G-scan2 fails in performing the diagnostic functions properly, Self Test function helps the user identify whether the communication problem is caused by the defective DLC main cable or the malfunction of the base unit. (This function does not tell which part of G-scan2 is defective)

Self-test is designed based on the Loop Back system, with which G-scan2 sends off signals from the base unit through the DLC cable, and the self-test adapter returns the signal back to the base unit. By sending signals from different channels and lines, and verifying the correctness of every signal echoed from this looped connection in each case, it becomes identifiable where the communication failure originated.

Caution

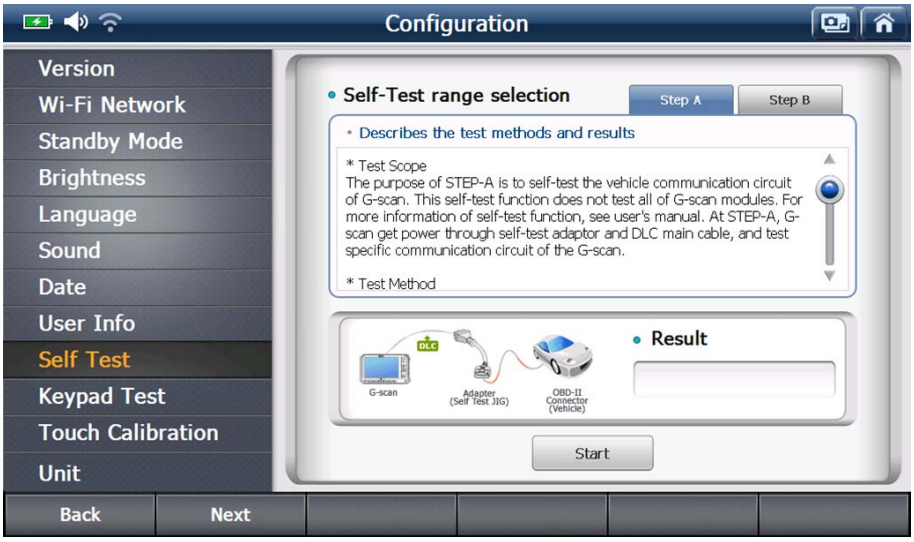
- Loop back test is not supported in some vehicles with High Speed CAN, Low Speed CAN and SAE J1708 communication systems.
- Self-test can be used with OBD-II / EOBD compliant cars only. Cannot be used with OBD1 generation cars with non-standard adapters.

The Self-test is consisted of 2 steps: STEP-A and STEP-B.

Please observe and follow the instructions given on the screen during the test.

The Self-test Adapter is used for the both steps.

- Step-A : Checks the internal communication control circuit of G-scan2 base unit
- Step-B : Checks the signal delivery circuit of the DLC main cable



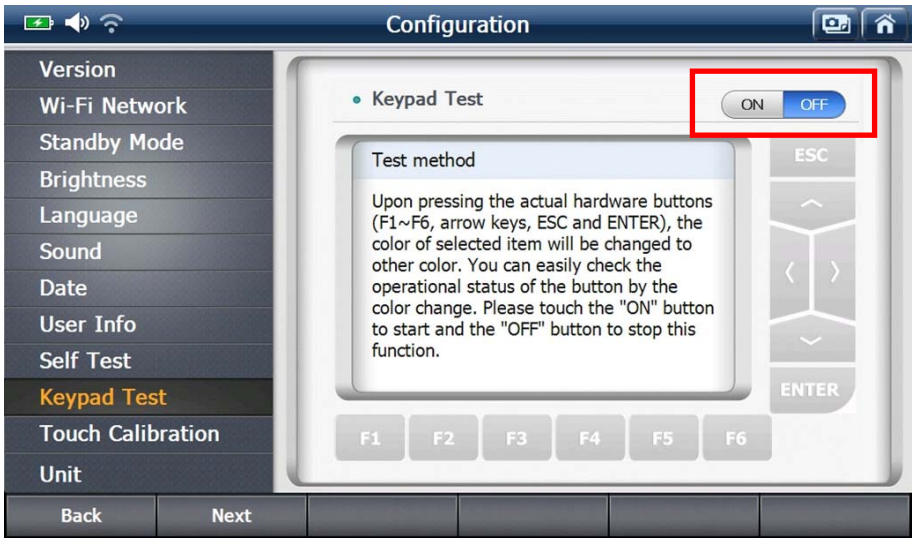
Caution

Please make sure to connect the Self-Test Adapter to the vehicle's diagnostic connector before starting the Self-Test process. The Self-adapter is a dedicated adapter used only for the self-testing purpose. Never use the Self-Test adapter for normal vehicle diagnosis, or it may cause serious damage to the vehicle and the G-scan2.

2-10. Keypad Test

Individual hard keys can be tested by observing the response of G-scan2 to a stroke.

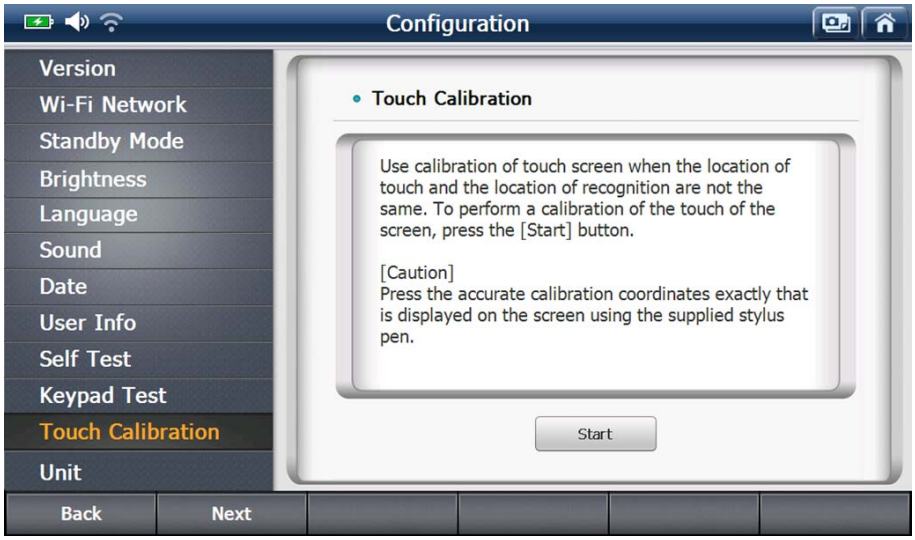
Switch the ON/OFF selector on the screen to “ON” to initiate the Keypad Test and refer to the Test Method for further process.



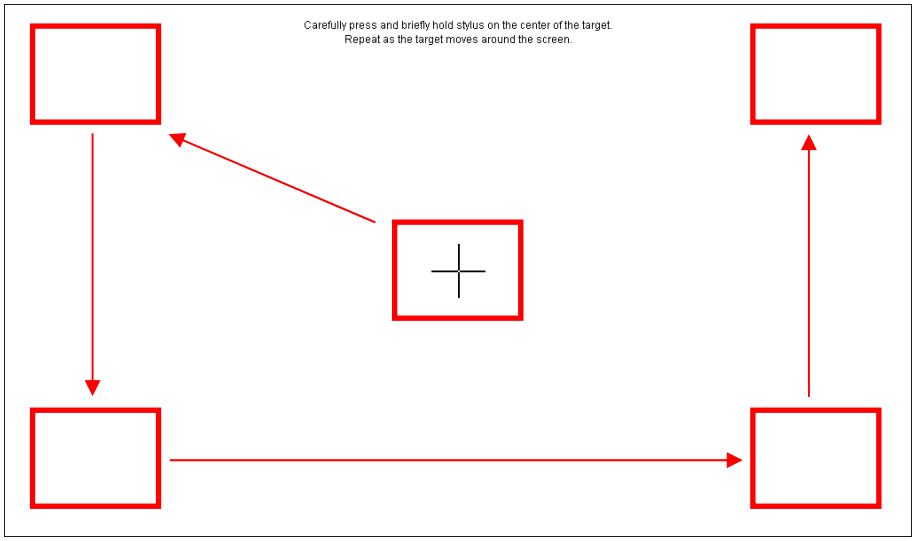
2-11. Touch Screen Calibration

G-scan2 may activate unwanted menu or item if the touch screen is not calibrated properly. The touch screen needs recalibration if the coordination of the actual position of the touched point is not recognized by the G-scan2 correctly.

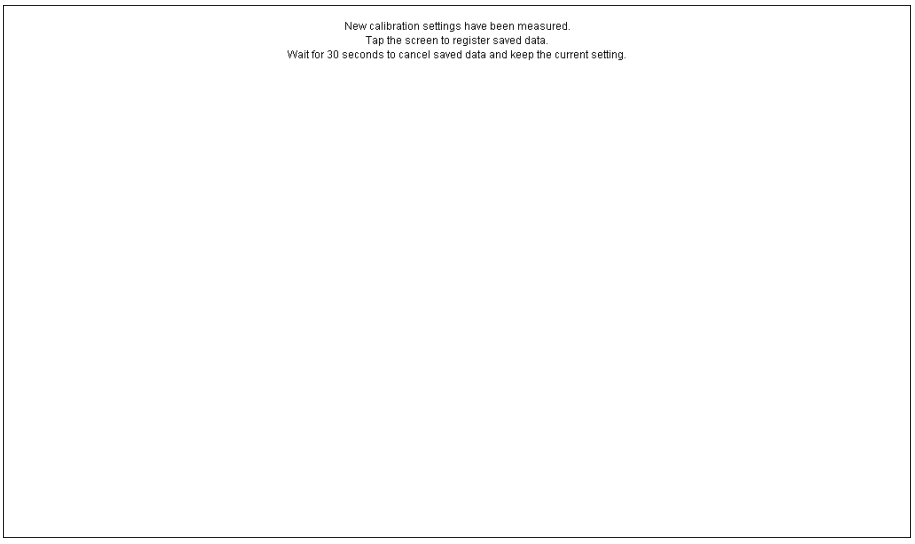
A. Select “Touch Calibration” from the Configuration menu and select “Start”



B. Touch the center of the crosshair one after another on the screen as shown below.

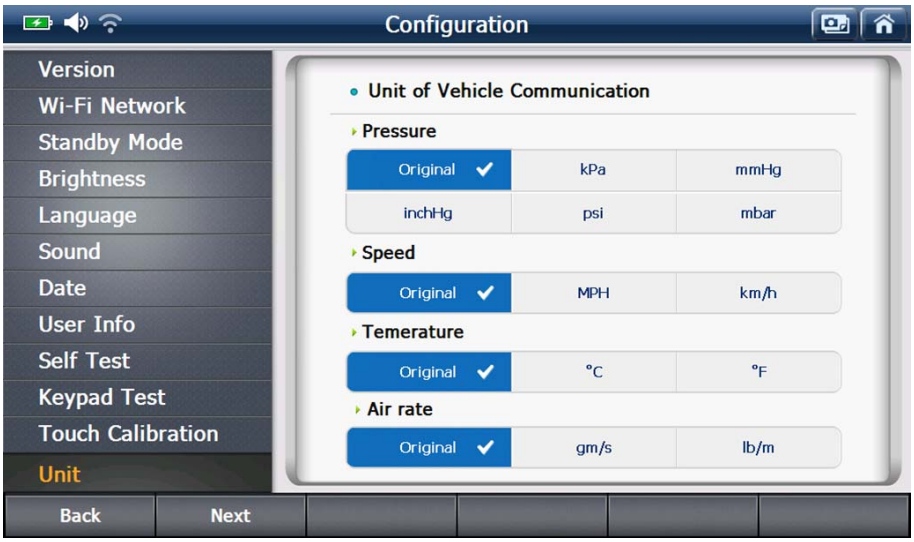


C. Touch any position on the screen to complete the process if you see the “Calibration Completed” message as shown below. If you want to cancel the calibration, wait for 30 seconds until the timer counts down to zero.



2-12. Unit

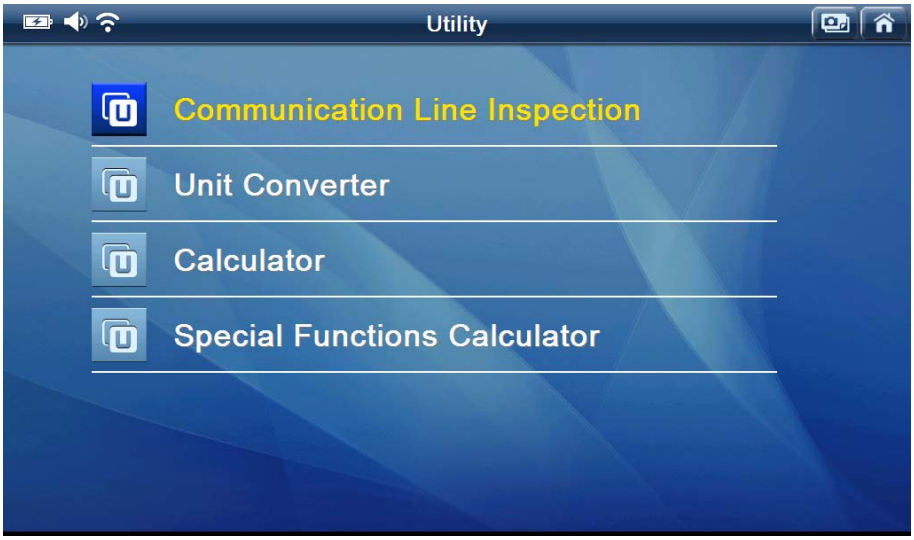
G-scan2 shows the parameter values and the measuring units just as the vehicle's Electronic Control Unit is programmed. However, it the different measuring units are preferred, the units can be selected among the given variations as preferred.



[Default measuring units as the vehicle's ECU is programmed]

3. Utility

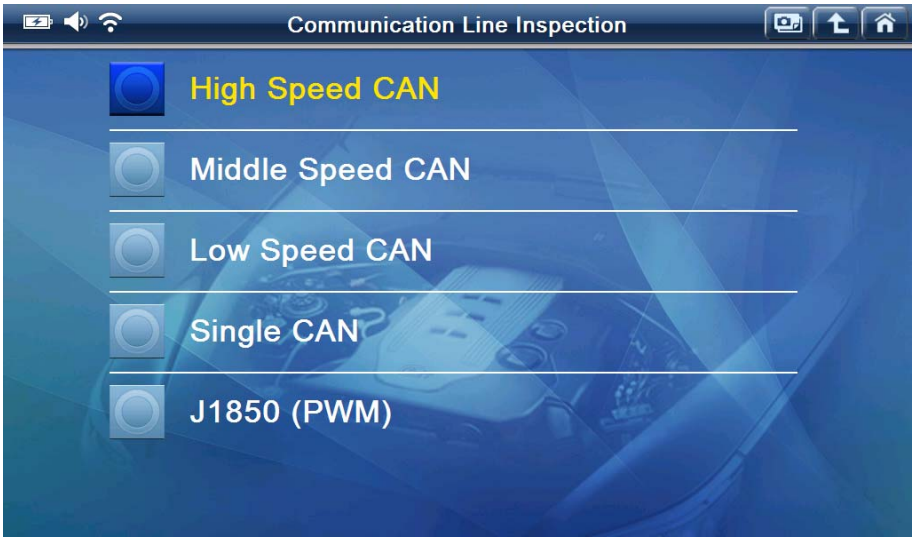
G-scan2 offers a variety of utility functions for user's convenience.



[Utility Functions]

3-1. Communication Line Inspection

The electronic control systems fitted in the cars are designed to comply with the specific communication protocols, and the electronic control units communicate with the G-scan2 based on the protocol as they are designed through the diagnostic adapter, mostly through the OBD2 socket.



This function helps the user figure out whether the vehicle's electronic control units communicate with the other control units properly or not by indicating the status of the communication signal by illuminating ON-OFF lamps by sensing the change of the voltage level of the communication signal pins of the diagnostic socket.

5 types of communication protocols including High Speed CAN-bus, Middle Speed CAN-bus, Low Speed Can-bus, Single CAN-bus and SAE J1850 (PWM) are supported by this test function.

The same procedure is applied for all the protocols. Therefore refer to the following example based on testing the High-speed CAN-Bus system, and consider the same procedure when testing the other communication protocols.

A. Check the 'Notice' pop-up and select "OK" to continue.
As instructed, make sure to turn the IG key to ON position.

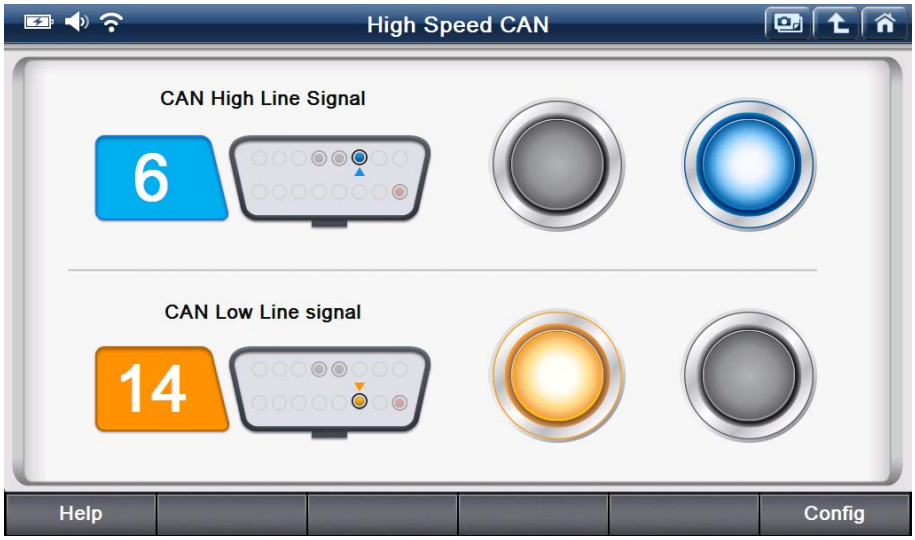
Caution

This function works based on the standard communication line assignment. However, sometimes the communication lines may be assigned to the different pins of OBD2/EBOD adapter for different cars according to the non-standard design by the car manufacturers.

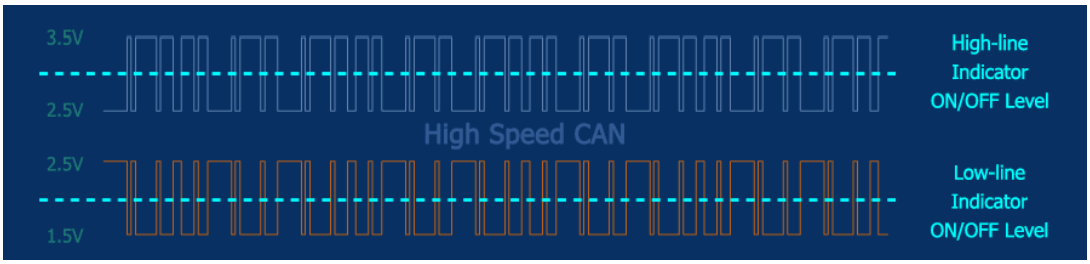
Please refer to the circuit diagram of the test vehicle and check the correct communication lines if the function fails due to no signal input. If the communication lines are found assigned

to the different pins, please select “Configuration” button in the bottom right, and change the settings accordingly.

B. Select “OK”, then the OBD2 connector pin numbers that the signals are being transmitted are indicated, and “Indicator lamps” illuminate in turn.



The illuminating “Indicator lamp” indicates that the change of voltage is being sensed from the communication lines as illustrated below.

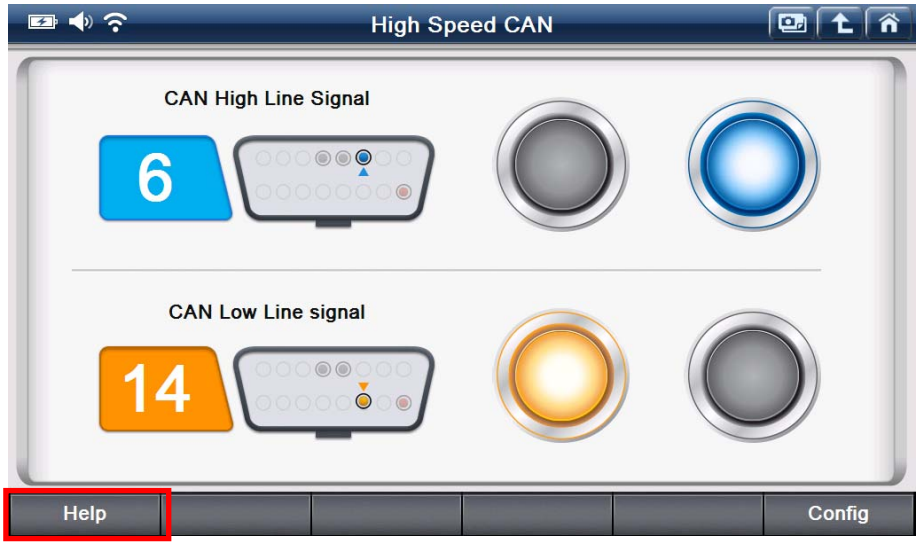


If the lamps are not flashing, check the IG Key ON status and the OBD2 connector’s signal pin assignment, then make closer inspection on the circuit.

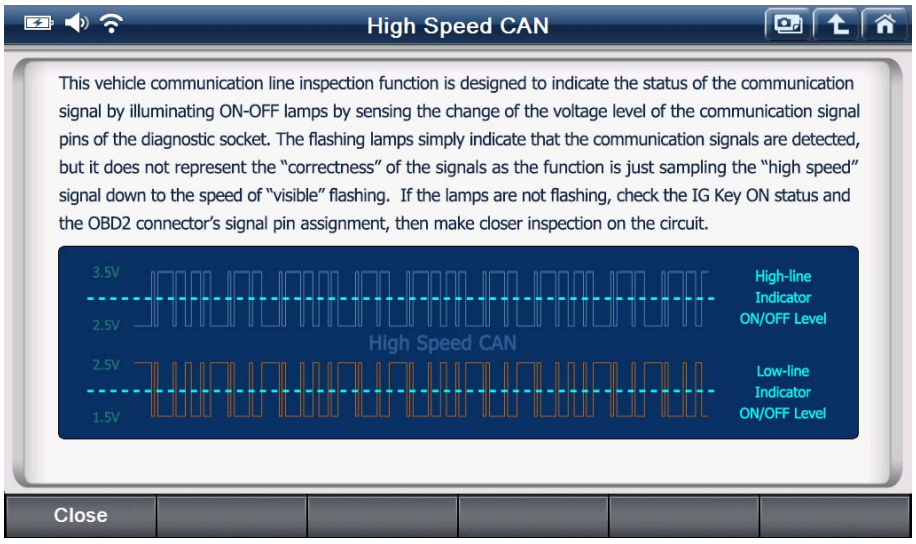
This function offers ability to test the communication of the vehicle’s control system indirectly. Please mind that the result of this function may differ from the direct reading from the communication lines, because the function is not measuring the voltage from the communication lines, but indirectly senses the voltage fluctuations through the OBD2 socket.

Also, the flashing lamps simply indicate that the communication signals are detected, and it does not represent the “correctness” of the signals as the function is just sampling the “high speed” signal down to the speed of “visible” flashing.

Select “Tips” and the additional information about the function follows as shown below.

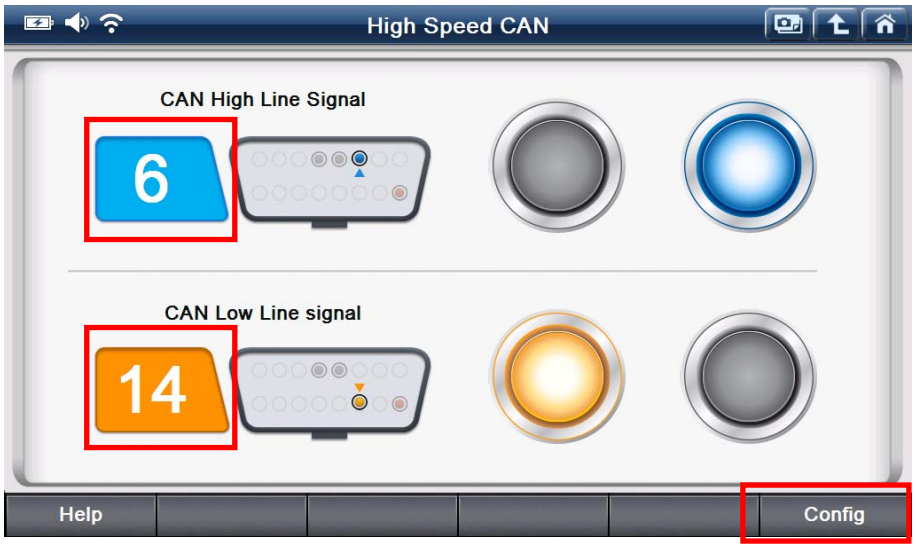


[Vehicle Communication Line Inspection – Tips]

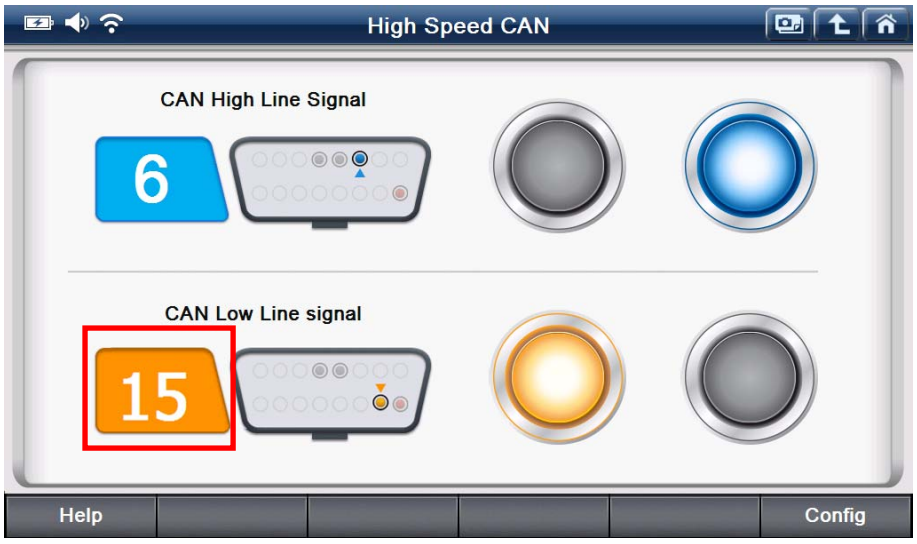


[Hi-Speed CAN-Bus Inspection Tips]

C. According to the Hi-Speed CAN-Bus standard protocol, the CAN-High communication line is assigned to Pin 6 and the CAN-Low line is assigned to pin 14 of the OBD2 socket as default. If the car is not complying with the standard, therefore the actual communication lines are assigned to the different pins, please select “Configuration” and change the settings accordingly.

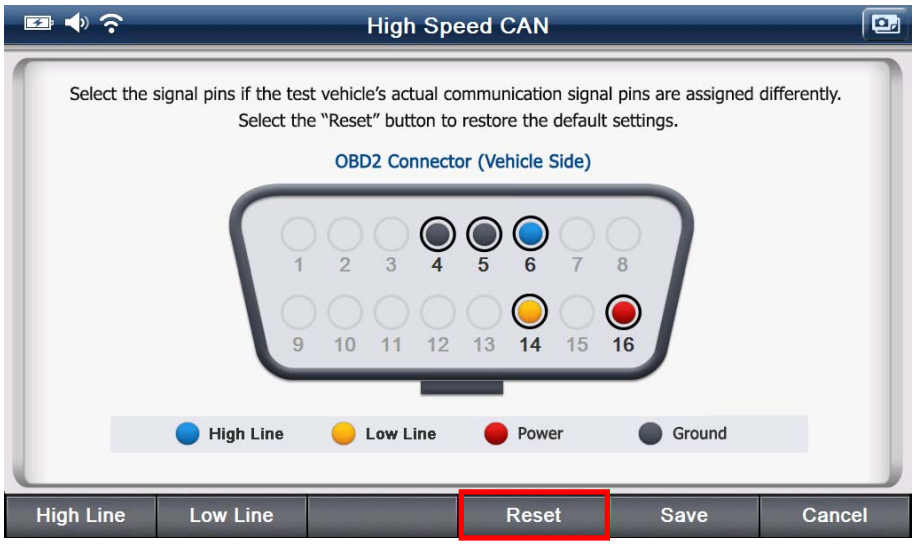


[Default Setting]



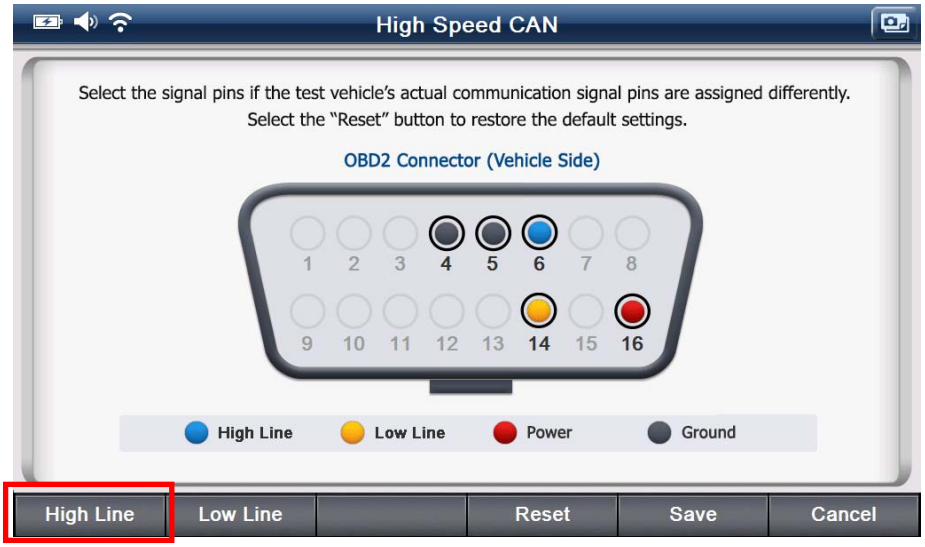
[Settings Changed: CAN-Low assigned to pin 15]

Selecting “Reset” will restore the default settings.



[“Reset” for default setting restoration]

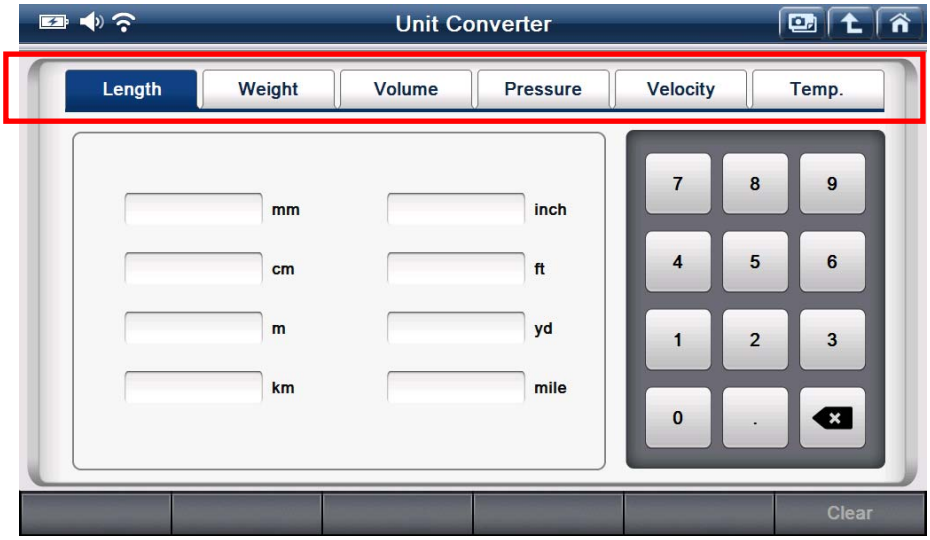
D. Interactive menu for changing the settings follows when “Configuration” is selected as shown below. Select “High Line” to select the pin assigned for CAN-High communication line.



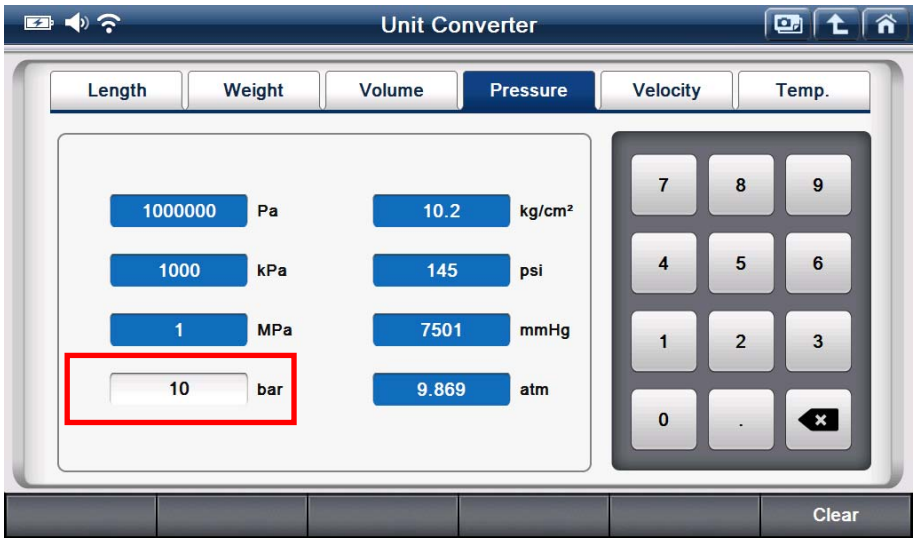
When the custom pin assignment is completed, select “Save” to save the changes.

3-2. Unit Converter

This is a utility function used for converting the length, weight, volume, pressure, speed and temperature readings to the different measuring units.



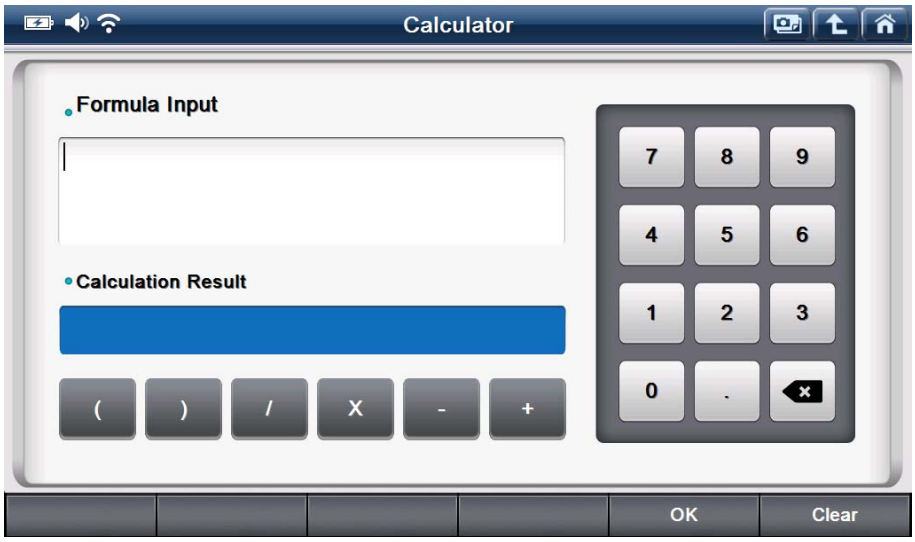
[Unit Converter Menu]



[Unit Conversion – Different pressure measuring units converted from 10 bar]

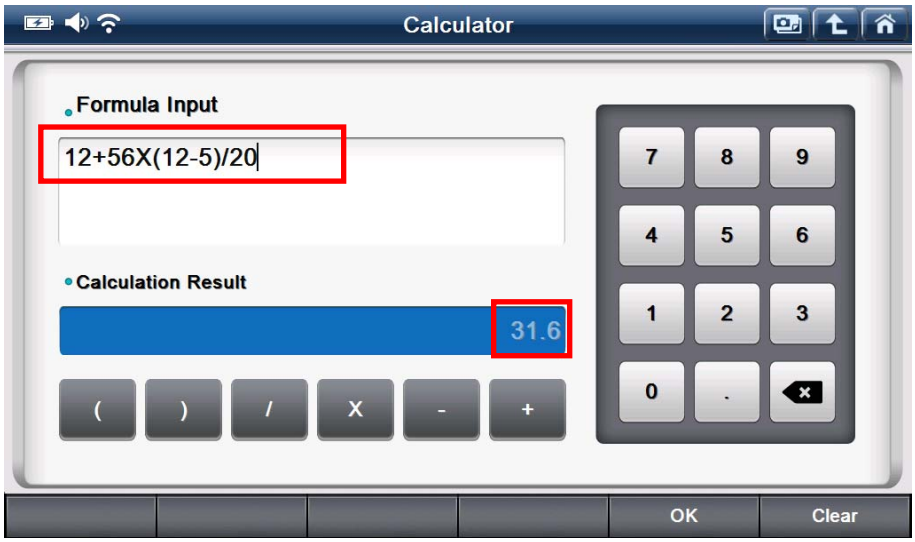
3-3. Calculator

This is a utility function that works like a simple calculator.



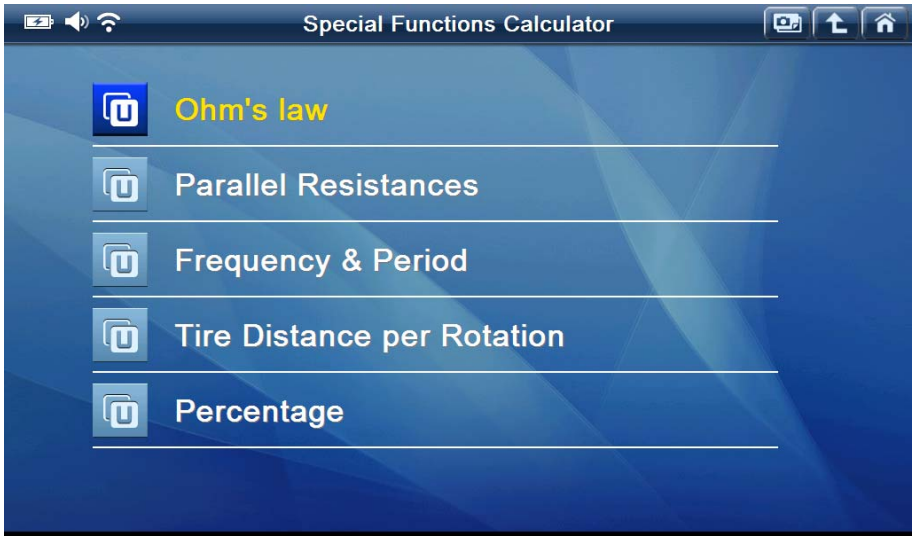
[Calculator]

The difference from an ordinary calculator is that you can type in the lengthy formula to get the result.



3-4. Special Functions Calculator

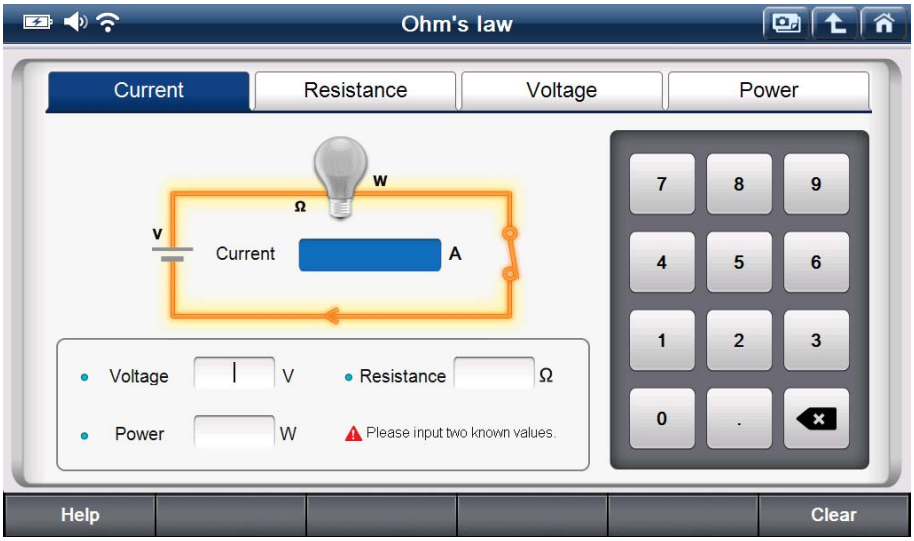
This is utility that offers a set of functions that are used frequently at the workshops, which include Ohm's law, parallel resistance, frequency/duty cycle, distance per tire rotation and percentage calculation.



[Special Functions Calculator Menu]

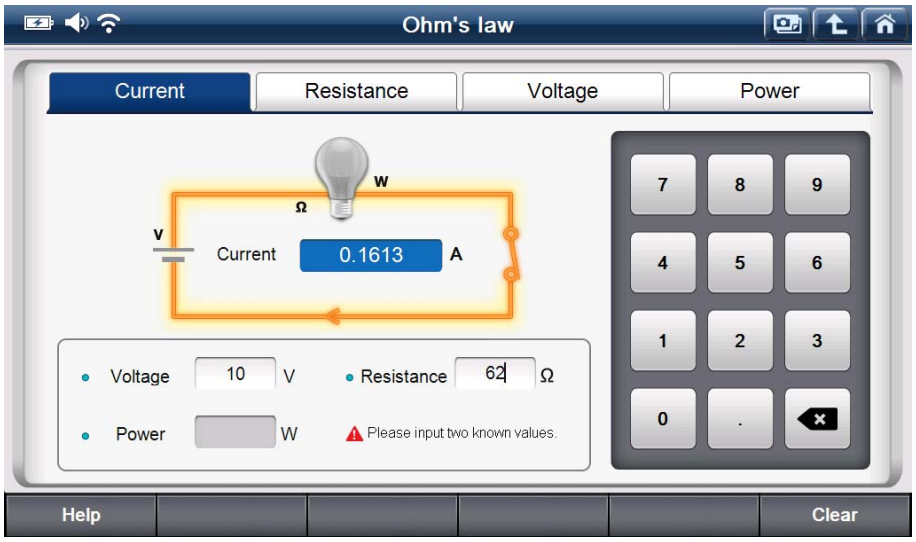
A. Ohm's Law

This function is to get the value you want from the given data with correlation among Amperage, Voltage, Resistance and Wattage according to the Ohm's law.



a. Amperage

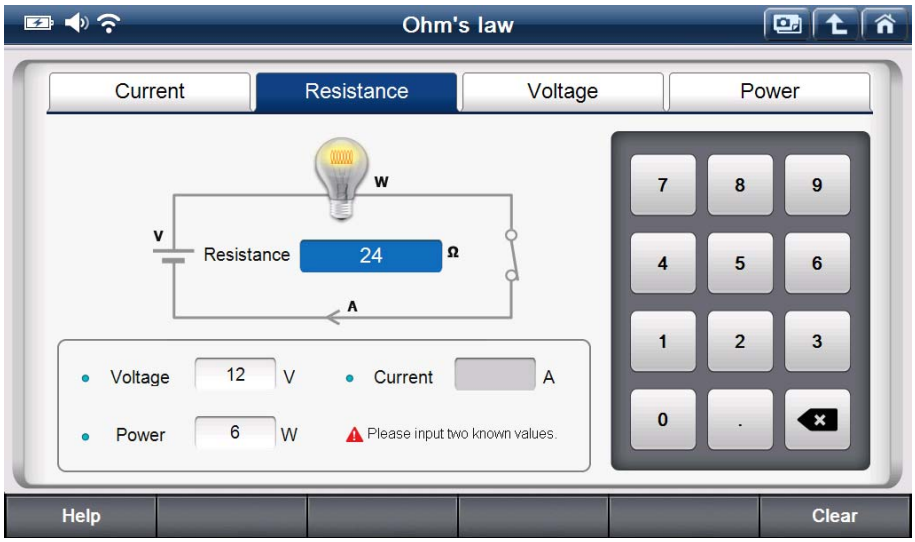
Input any known 2 values of Voltage, Resistance and Wattage, then Amperage is calculated.



[Example. Amperage Calculation]

b. Resistance

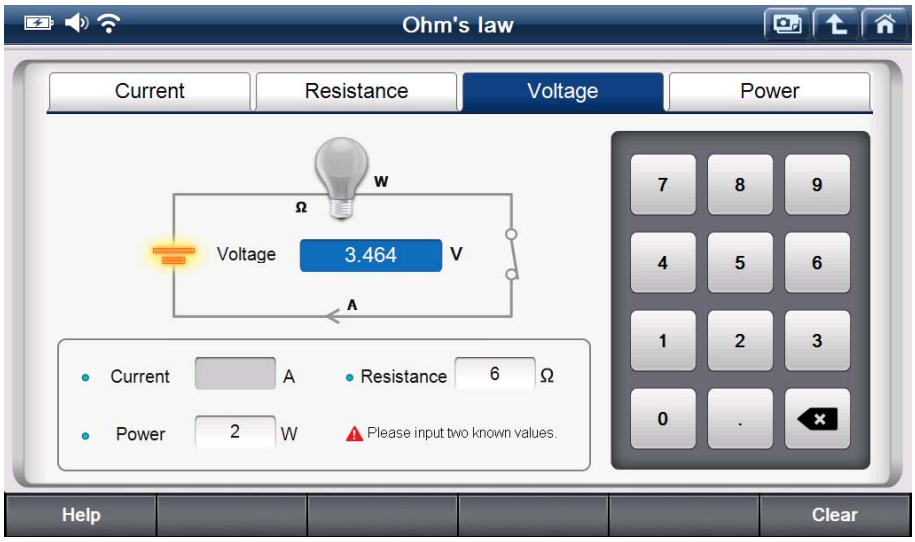
Input any known 2 values of Voltage, Amperage and Wattage, then Resistance is calculated.



[Example. Resistance Calculation]

c. Voltage

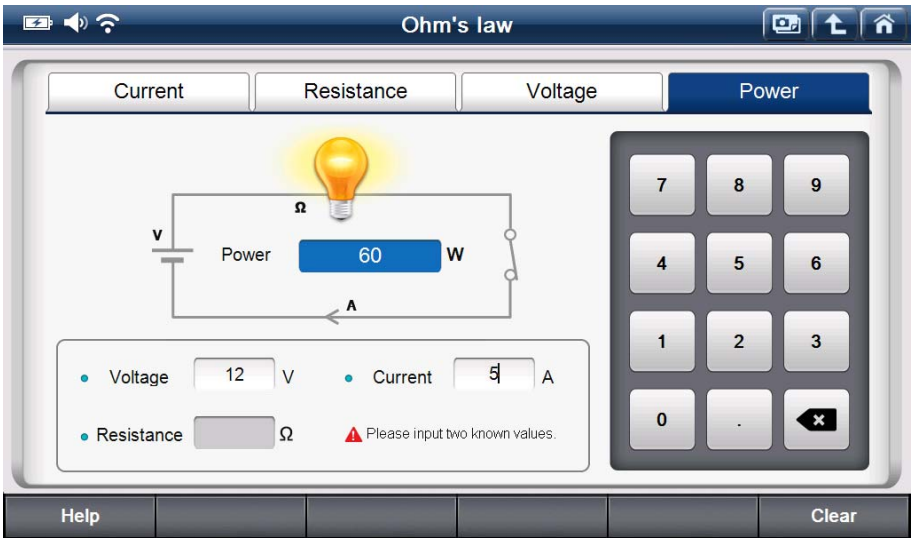
Input any known 2 values of Resistance, Amperage and Wattage, then Voltage is calculated.



[Example. Voltage Calculation]

d. Wattage

Input any known 2 values of Voltage, Resistance and Amperage, then Wattage is calculated.

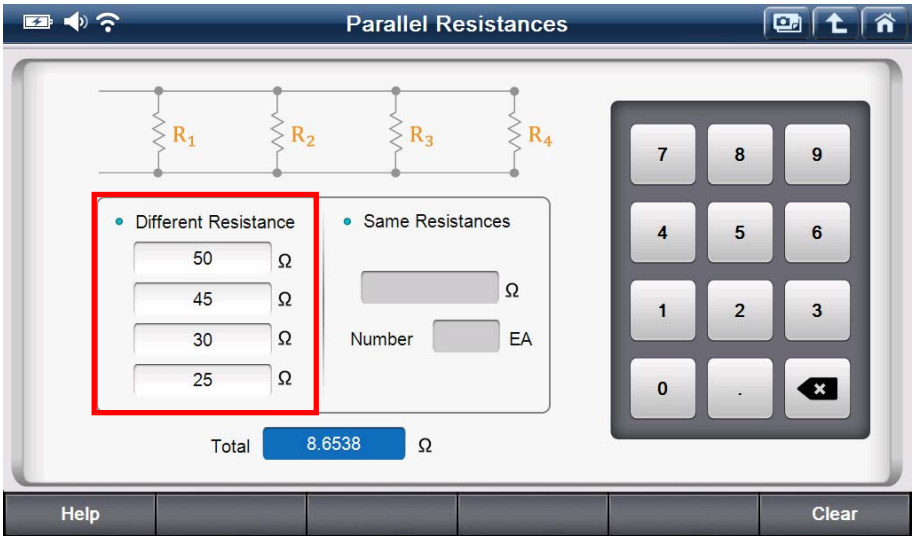


[Example. Power Calculation]

B. Parallel Resistance

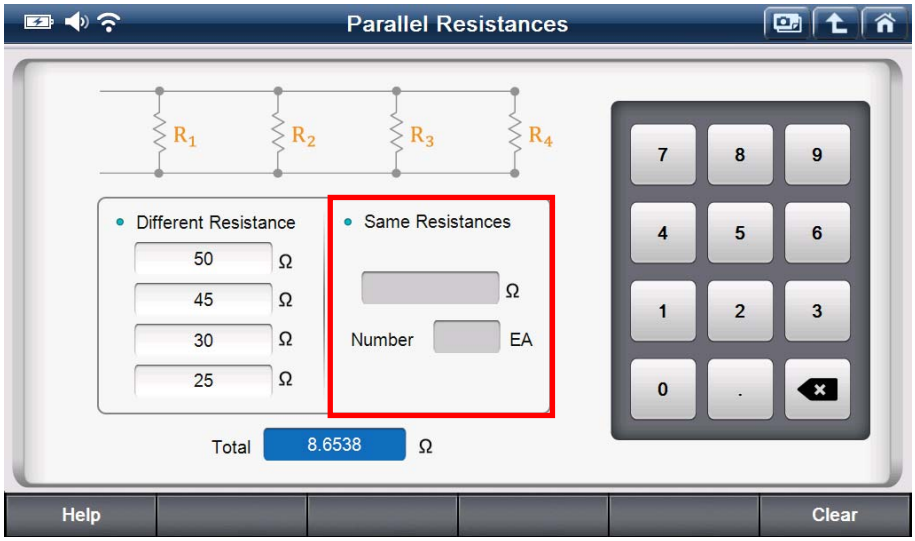
This function helps the user calculate the combined resistance of all resistors connected in parallel in the circuit.

The parallel resistance is calculated by typing in the resistance values of up to 4 resistors connected in parallel if the resistors have different resistance values. For more than 5 resistors, please get the parallel resistance for the first 4, and then input the result and the more resistance values to get the final result.



[Parallel Resistance – individual resistance value input]

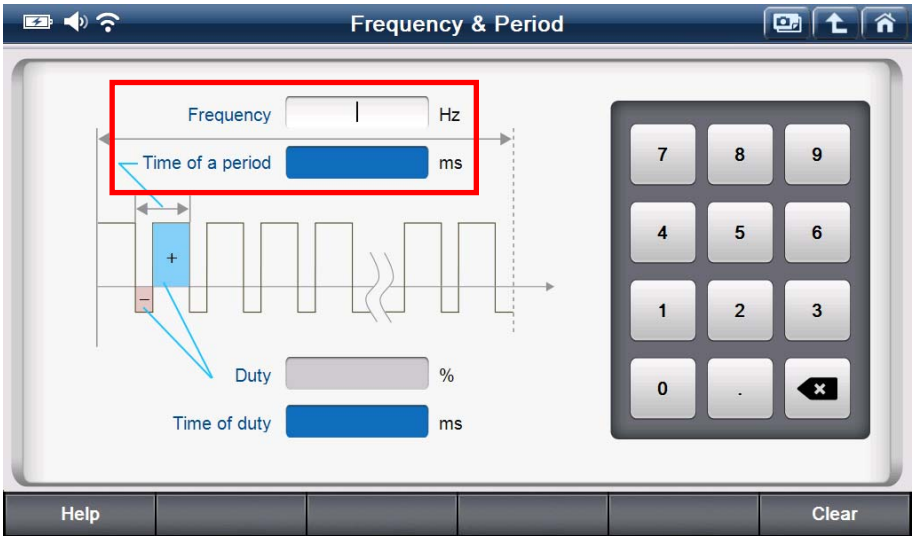
If the resistors are of the same resistance values, type in the value and the number of resistances to calculate the total parallel resistance.



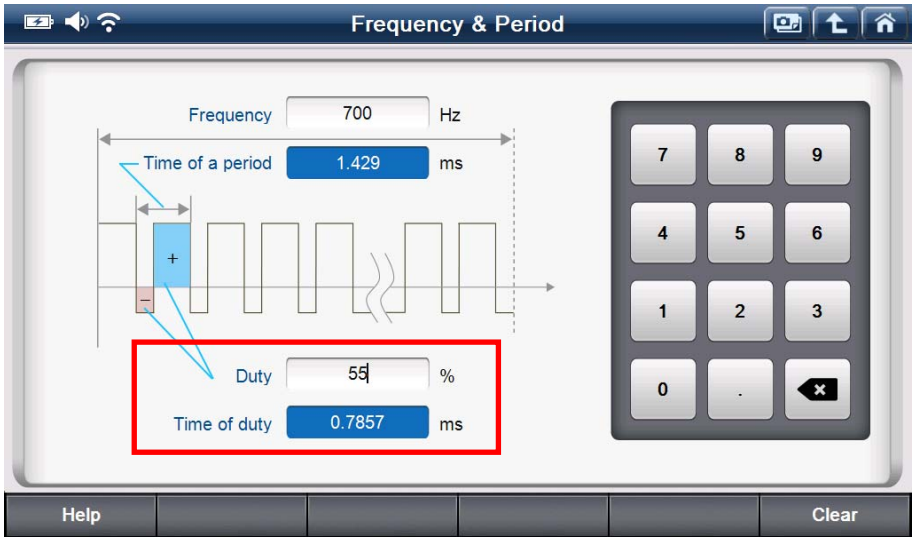
[Parallel Resistance – Multiple resistances of same value]

C. Frequency and Period

This function helps the user calculate the duration of one cycle according to the frequency and duty. While frequency means “working numbers per second”, this function converts it to “duration of each work”.



[Frequency and Period. Ex. Duration of a cycle]



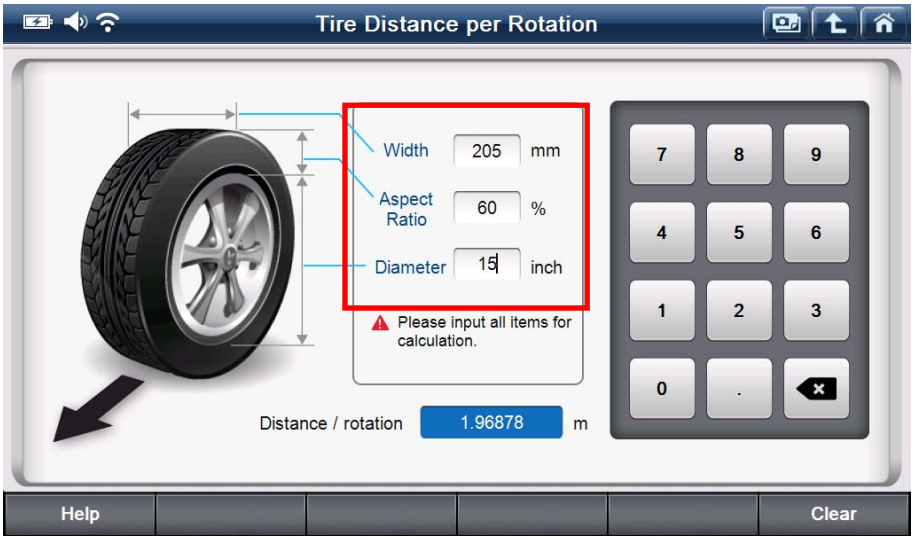
[Frequency and Period. Ex. Duration of duty]

D. Tire Distance per rotation

This function is used for calculating the distance traveled when a tire revolves one time based on the width, flatness ratio and inner diameter that can be checked on the surface of any tires.

205 / 60 R 15

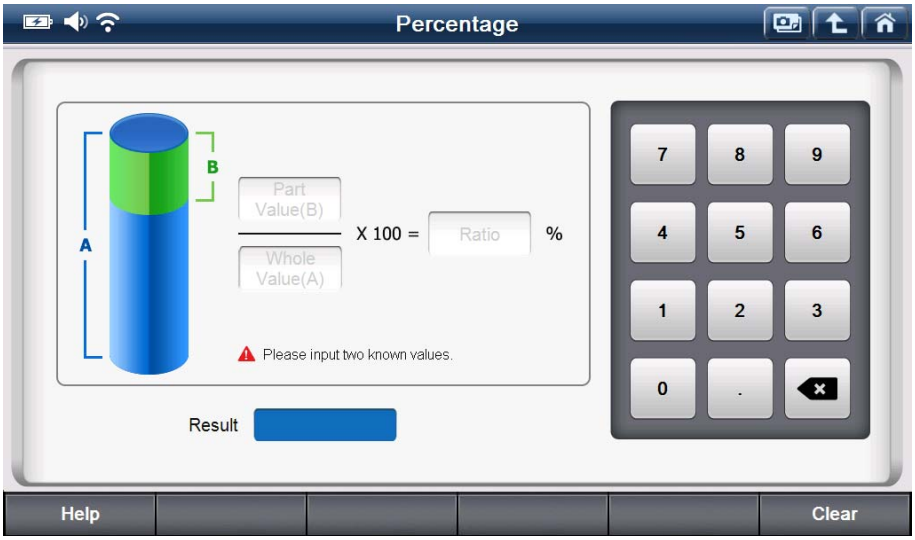
Width **Flatness Ratio** **Inner Diameter**



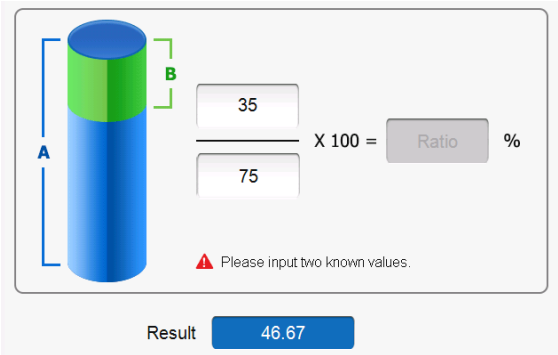
[Distance per tire revolution]

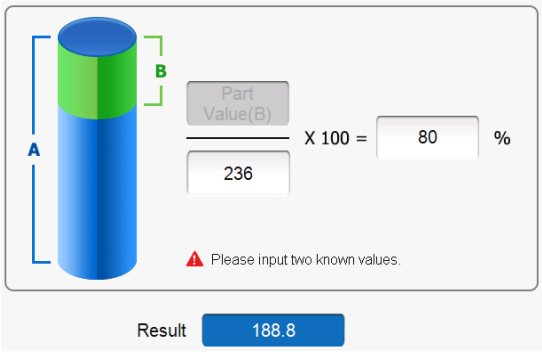
E. Percentage

This function calculates the one out of the other two input variables among Total Value, Percentage and Partial Value.



[Percentage Calculation]





Bottom Menu

The bottom menu includes the buttons for Internet Update and Power Control.

[Bottom Menu]

Icon	Title	Description
	Internet Update	Activates Internet Quick Update function. G-scan2 needs to be registered on GIT's server before using this function and connected to internet through WiFi networking. Software for just one brand can be downloaded at a time for this quick update function. Use of PC Utility is recommended for downloading multiple brands
	Power Control	Switches G-scan2 to the Stand-by mode after 5 seconds.

1. Internet Quick Update

G-scan2 software update is released every 3 months, and the minor patches can be released in response to customer feedback more frequently as needed. G-scan2 needs to be updated of its software to add the new features for extending the coverage for more brands, models and functions as well as the improvement of the product performance.

G-scan2 internet update can be done in 2 ways:

- Download by Direct WiFi Connection
- Download using PC Utility

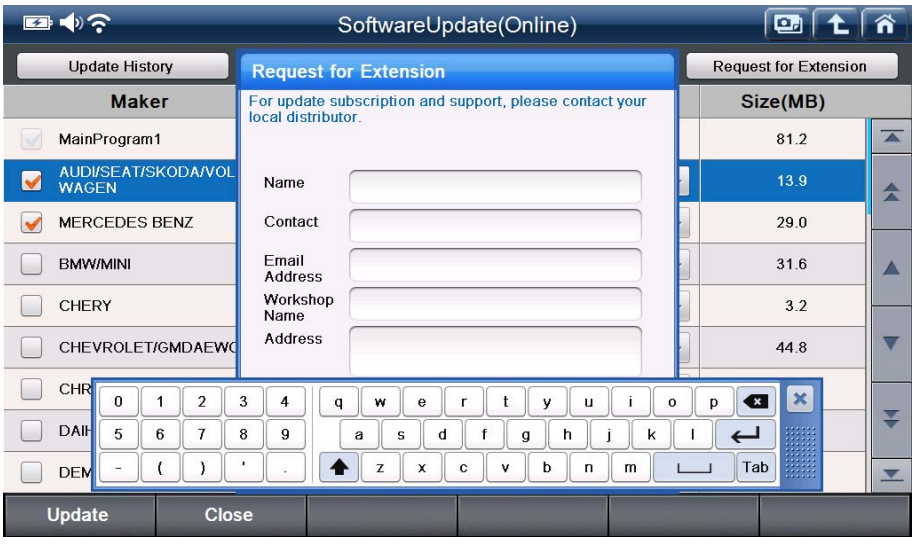
1-1. Quick update by Direct WiFi Connection

Utilizing the onboard WiFi module, G-scan2 can access to GIT's update server directly through internet, check the available updates, select and download the update files.
All these operations can be done on the G-scan2 base unit.

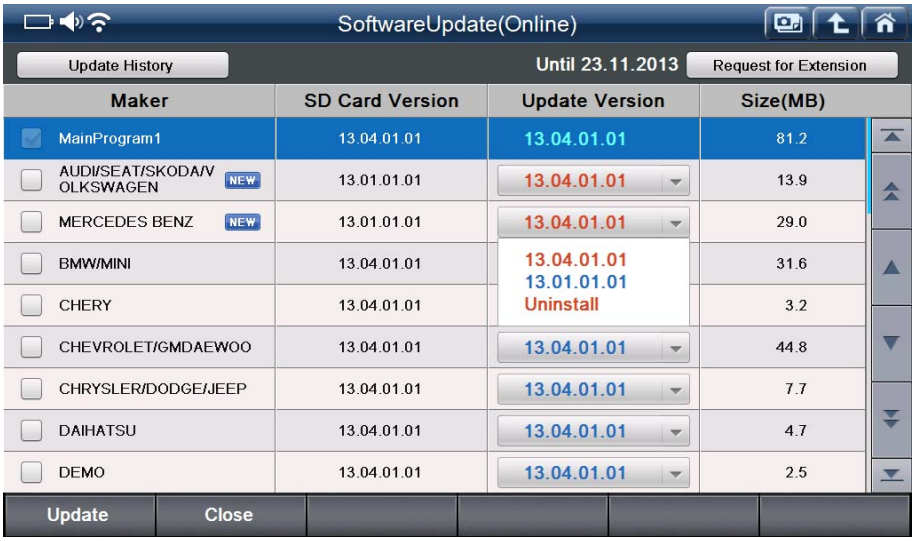
A. Please make sure that the G-scan2 is connected to the internet through the WiFi network. Select Internet Update icon in the bottom left of the main menu, then the internet update function is initiated.

B. Check the availability of new updates.
"New" icon represents that the new update is available for the car manufacturer.

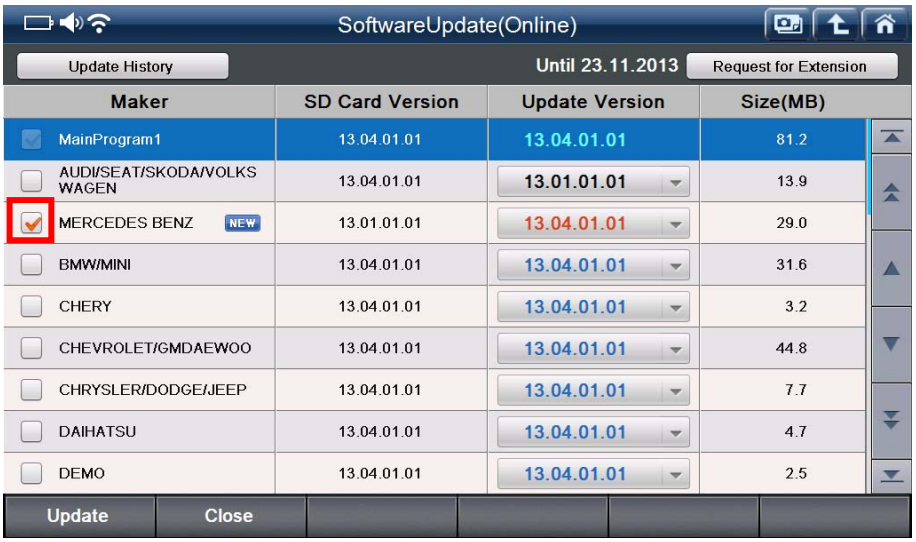
If the update subscription has been expired, no car manufacturers will be listed.
In this case, please check the Expiry Data information provided in the upper right side of the screen and contact your local distributor for the renewal or extension of the G-scan2's update subscription. Or, simply select the "Request for Extension" button in the top right corner, fill in the pop-up query with your contact information and select "Confirm", then the request will be sent to your local distributor automatically.



The download server may offer multiple versions for each vehicle brand, therefore you can also select the older version if available in case you do not like the new features and want to restore the known best version.



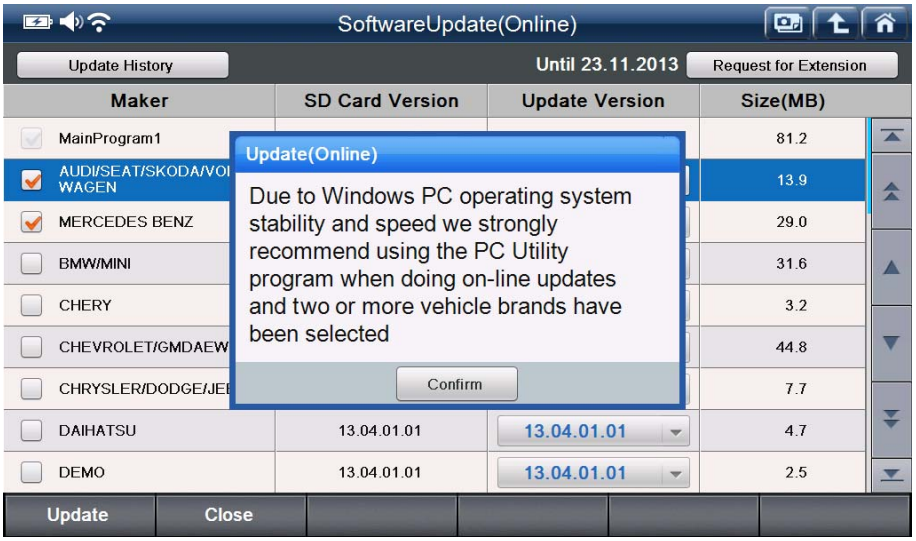
C. Select the car manufacturer by ticking on the check box.



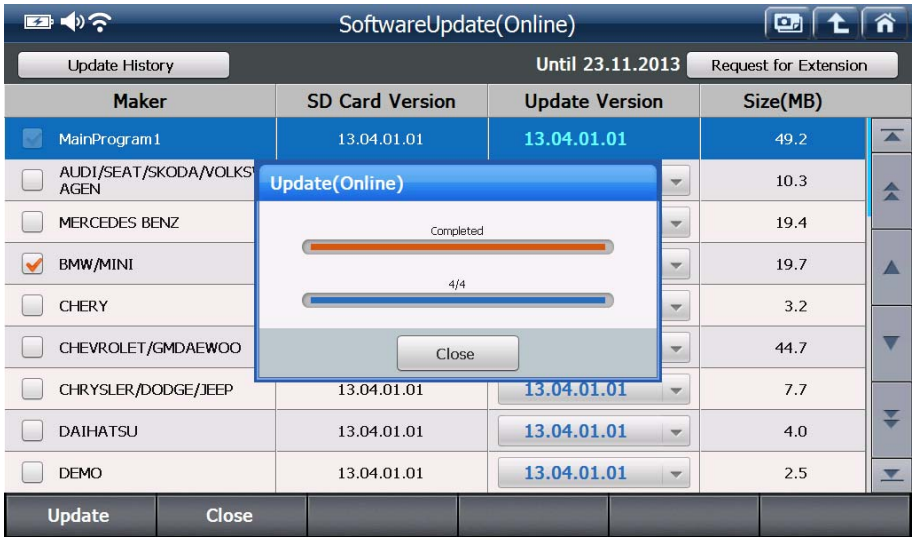
D. Even though G-scan2 is running on the latest Windows CE system, when compared with PC's Windows operating systems, it shows relatively limited stability and performance for conducting heavy operations like downloading, extracting, deleting and copying the big size files.

Direct WiFi download is allowed for downloading the programs for 1 vehicle brand at a time, and when the 2nd car manufacturer is selected from the menu, the warning message will pop up as shown below.

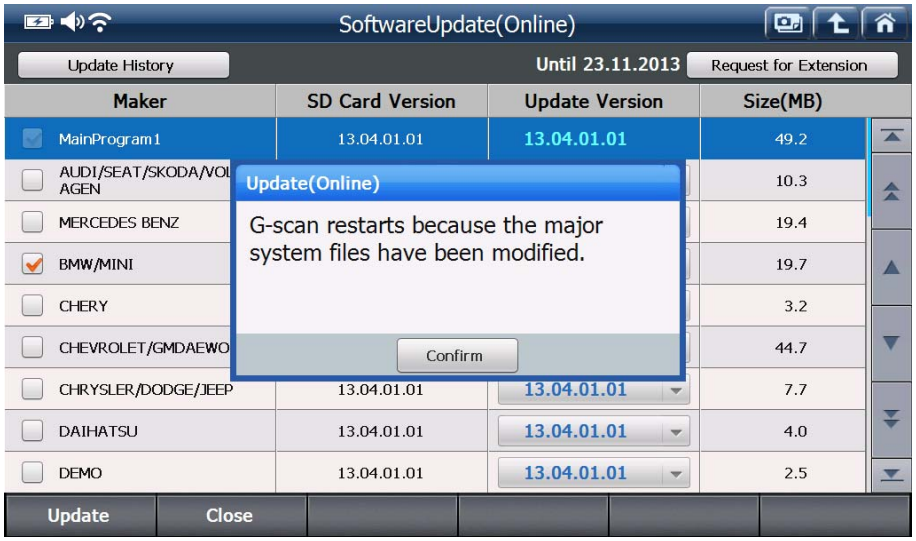
Please use the PC Utility program when doing on-line updates for more than 2 car manufacturers.



E. Select “Update” button in the bottom left corner, then G-scan2 begins downloading the selected files from the server. Software update is consisted of total 4 steps – downloading, deleting, copying and verifying and the progress is indicated as shown below.



F. Select “Close” button when the software update is completed.
In most cases, G-scan2 needs to restart to apply the newly downloaded updates.
Select the “Confirm” button to let the G-scan2 restart its system.



1-2. Download using PC Utility

In case the WiFi facility is not available or downloading the files for 2 or more car manufacturers is required, PC Utility needs to be used for updating the G-scan2 software.

Please refer to the Chapter 4. G-scan2 PC Utility in this manual for more details.

2. Power Management

Selecting this button works primarily the same as pressing the [Power] key shortly.

When selected, the following window pops-up for further selection – sleep mode or complete power off.

Select Standby Mode button to let the G-scan2 enter into the hibernating mode, then G-scan2 will restart instantly by a key stroke or a touch on the screen, without the boot up sequence.

Select Power Off button to turn the G-scan2 completely. G-scan2 will make a cold start taking the normal boot up sequence when the [Power] key is pressed.