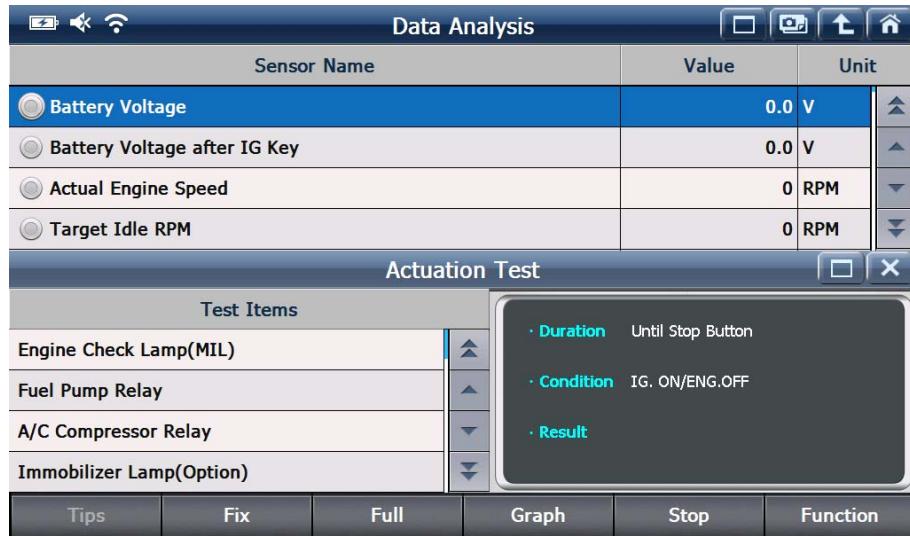
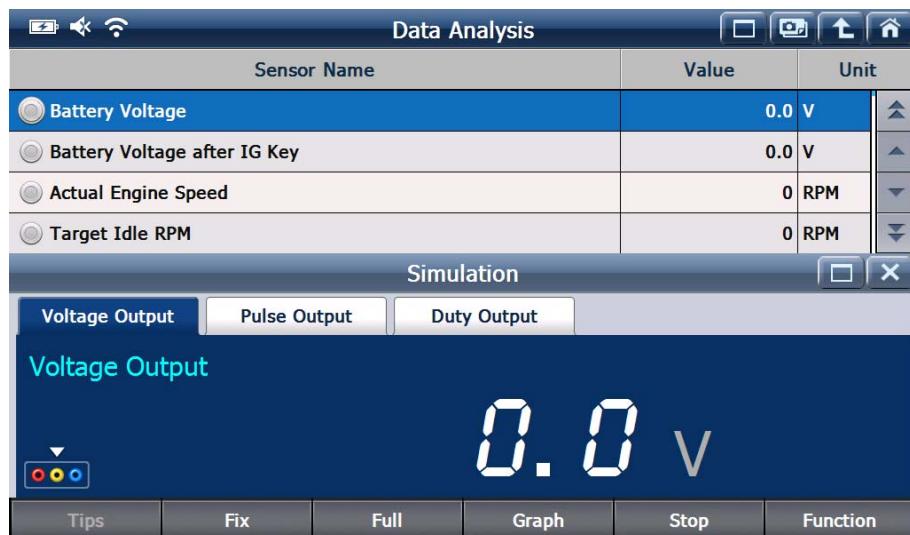


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3.3. Data + Simulation

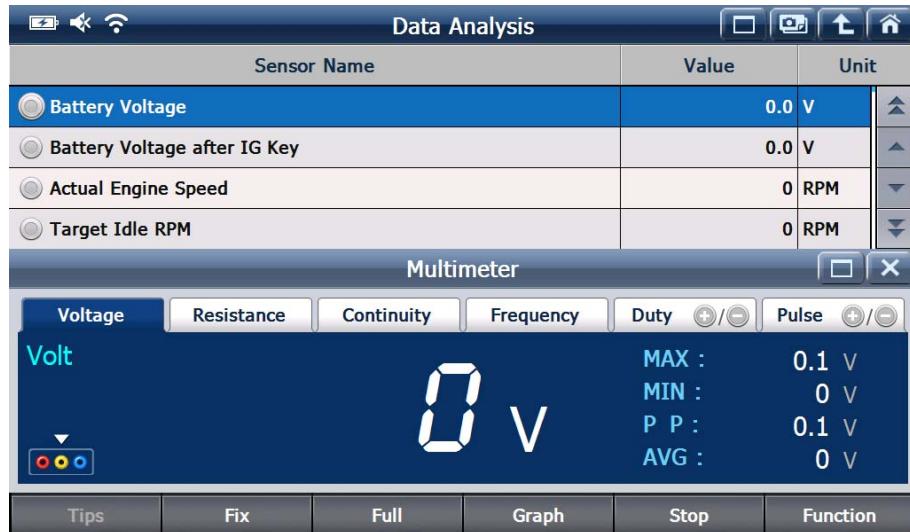
G-scan2 conducts the Measurement function's simulation function that sends out the electric signal to the sensor / actuator wire while showing the Data Analysis function's data list simultaneously.



G-scan2 User Manual

3.4. Data + Multimeter

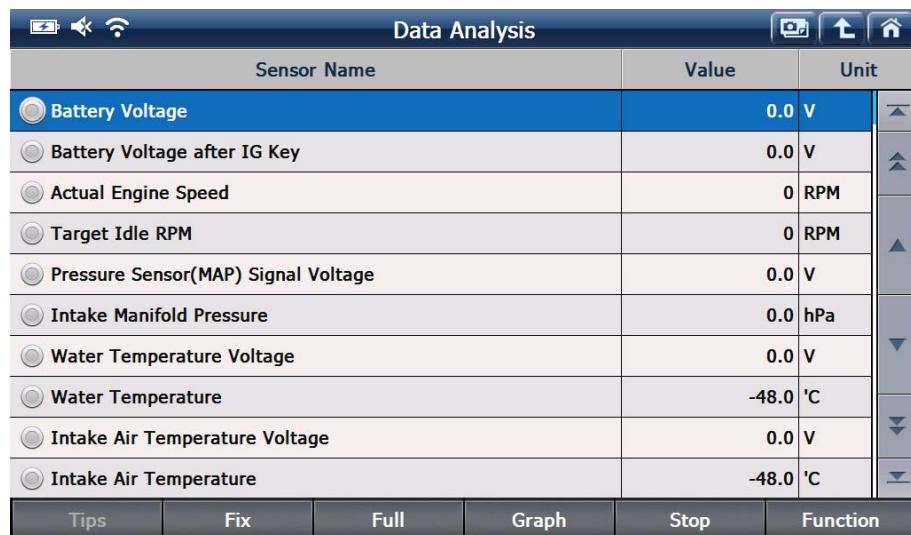
G-scan2 shows the actual multi-meter readings using its measurement function and displays the data values received from the control unit using the Data Analysis function enabling the direct comparison between the actual reading and the data processed by the control unit.



4. Data Record (trigger mode)

4.1. Parameter Selection

For recording the data list in Data Analysis, one or more parameter needs to be selected by ticking on the buttons in the head of the parameter names.



G-scan2 User Manual

Data Analysis		
Sensor Name	Value	Unit
Battery Voltage	0.0	V
Battery Voltage after IG Key	0.0	V
Actual Engine Speed	0	RPM
Target Idle RPM	0	RPM
Pressure Sensor(MAP) Signal Voltage	V	
Intake Manifold Pressure		hPa
Water Temperature Voltage		V
Water Temperature		'C
Intake Air Temperature Voltage		V
Intake Air Temperature		'C

Buttons at the bottom: Tips, Fix, Full, Graph, Stop, Function

4.2. Data Recording

Select “Function” or press the [F6] key from the Data List display, then select [Record] button among the functions list.

Data Analysis		
Sensor Name	Value	Unit
Battery Voltage	0.0	V
Battery Voltage after IG Key	0.0	V
Actual Engine Speed	0	RPM
Target Idle RPM	0	RPM
Pressure Sensor(MAP) Signal Voltage	V	
Intake Manifold Pressure		hPa
Water Temperature Voltage		V
Water Temperature		'C
Intake Air Temperature Voltage		V
Intake Air Temperature		'C

Function menu open over the table:

- Function
 - Record
 - Text/Graph
 - Go to Trigger
 - Recorded Data Info
 - Reset Min/Max
 - Two cursor A
 - Item List
 - Two cursor B
 - Data Group Selection
- Dual Mode
 - DTC + Data
 - Data + Actuation
 - Data + Simulation
 - Data + Multimeter

Buttons at the bottom: Tips, Fix, Full, Graph, Stop, Function

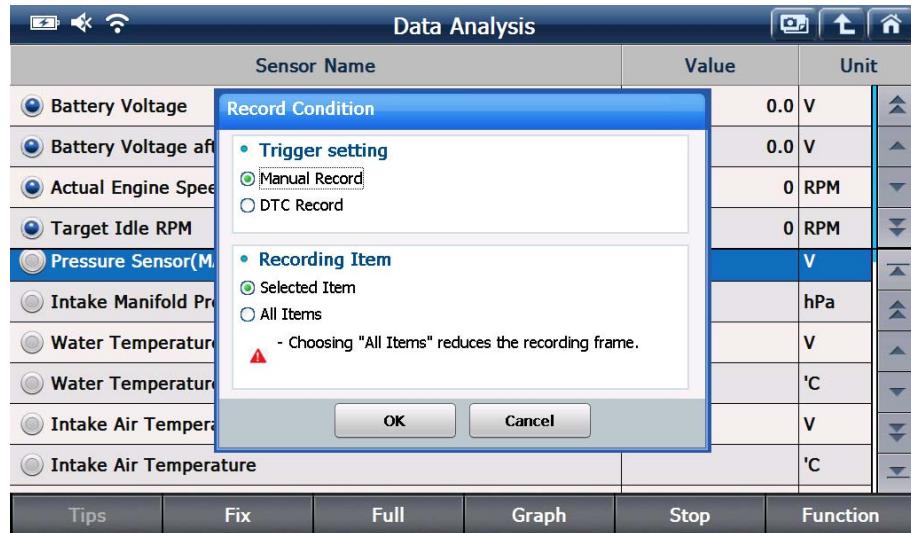
4.3. Trigger Mode

Select Trigger Mode either Manual Record or DTC Record.

Button	Description
Manual Record	Trigger point is recorded when the “Trigger” button is manually selected by the user.
DTC Record	Trigger point is recorded automatically when the G-scan2 reads the DTC from the control unit.

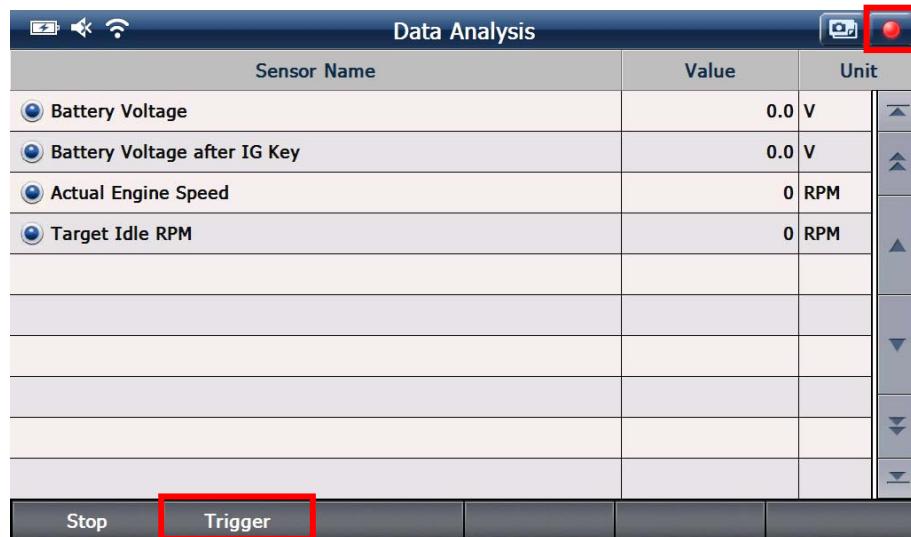
G-scan2 User Manual

In the same dialog window, the range of the recorded parameters can be selected either “Selected Items” or “All items”.



Please note that selecting All Items will consume more memories, therefore will reduce the number of recordable frames with the given memory size.

When OK is selected, the Data Recording will start. Check the red dot “Record” sign in the top right corner.

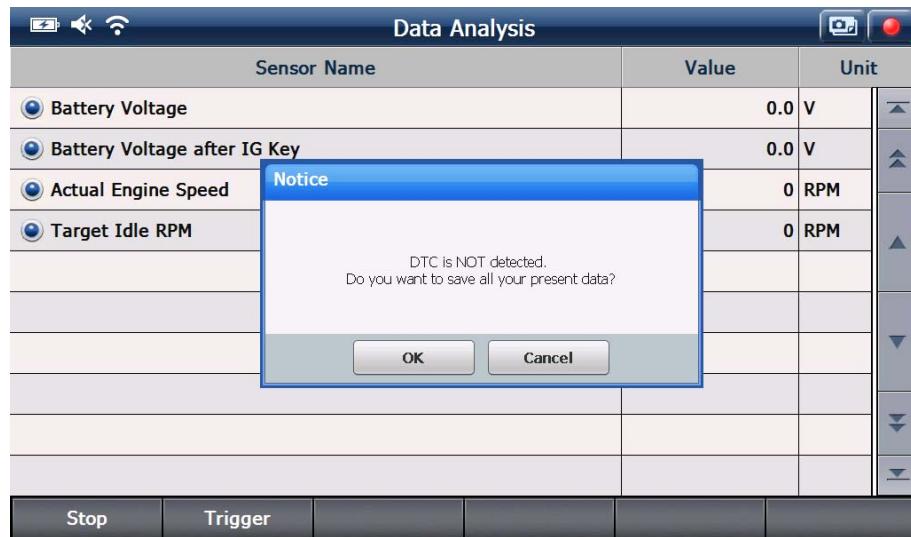


If Manual Trigger is selected, select “Trigger” button, or press [F2] key, to trigger the data recording manually.

If DTC Trigger is selected, the trigger is recorded automatically when the DTC is detected. If no DTC is detected while recording, select either save the recorded data anyway or cancel

G-scan2 User Manual

and retry.



4.4. Recorded Data Review

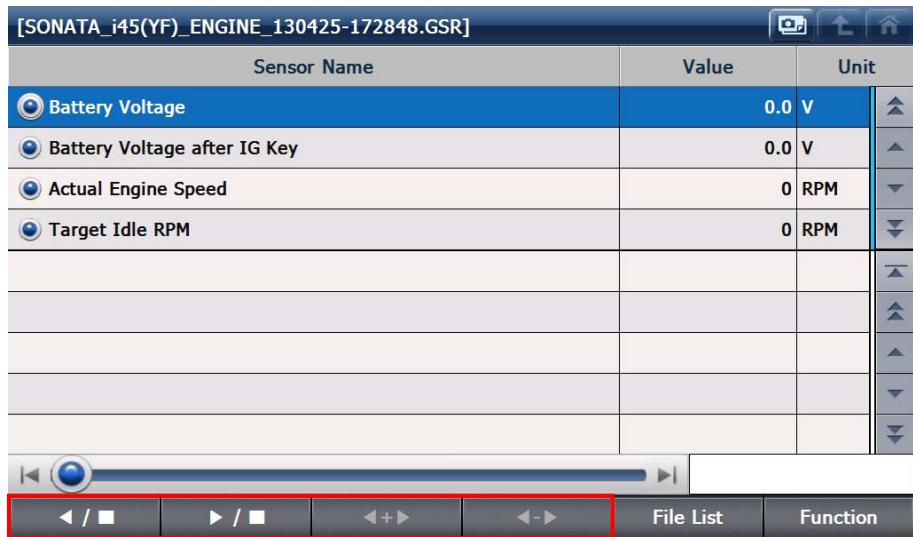
Recorded Data can be reviewed by Flight Record Review function.

Select the file and press “Run” button or “F1” key to load the recorded data.



The recorded data can be played forward and reverse using the record player control buttons in the bottom or the relevant F1~F4 keys.

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Select the “Function” button or press the F6 key to open the additional control functions menu



A. Text/Graph

Toggles the display mode among Text mode and Graphic mode.

B. Go to Trigger

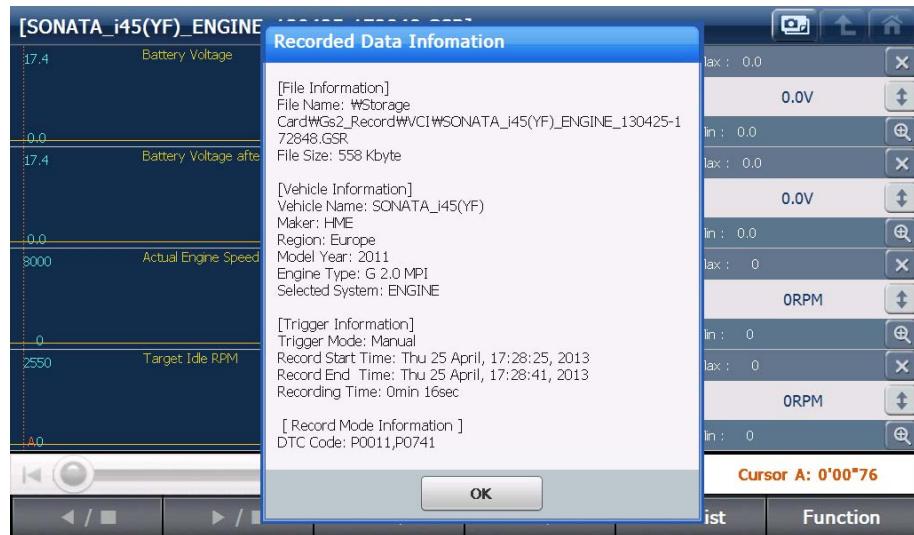
Moves the cursor A to the trigger point.

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C. Recorded Data Info

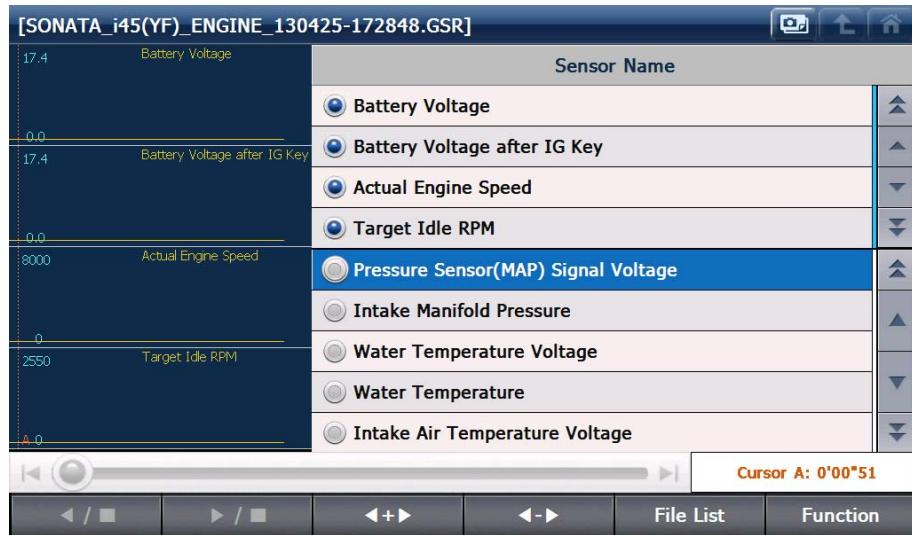
Shows the details of the Recorded Data file currently being displayed.



D. Item List

G-scan2 Flight Record Review function for Hyundai and Kia may show up to 4 parameters at a time. If you have recorded more than 4 parameters and want to select the other parameters to be displayed in the graphical forms, you may select the desired parameters from the "Sensor Name" list as shown below.

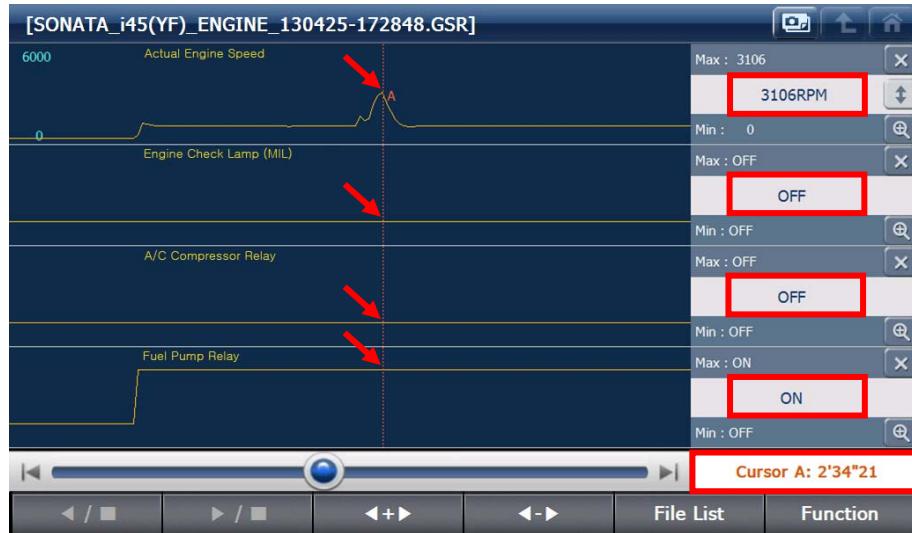
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E. Two Cursor A

Cursor A is a vertical red dot line, and the parameter values at the time of the cursor point are indicated on the right side of the screen.

Also the elapsed time from the start point to the cursor position is indicated in the bottom right corner.



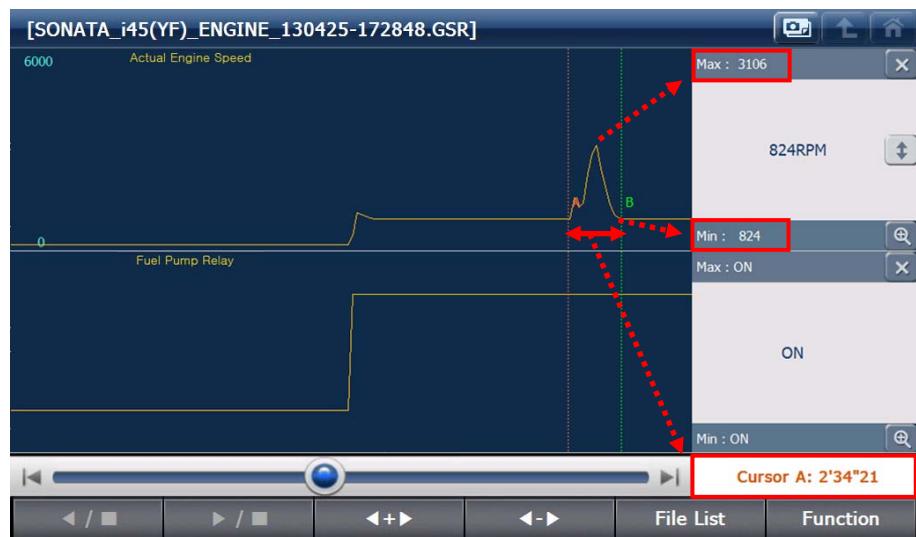
F. Two Cursor B

Trigger B is activated and appears as the vertical green dot line as shown below.

The minimum and maximum values between the positions of Cursor A and B are indicated in the right side of the screen.

Also the time difference between the cursor A and B is indicated in the bottom right corner.

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3.5. Measurement



G-scan2 Basic Functions

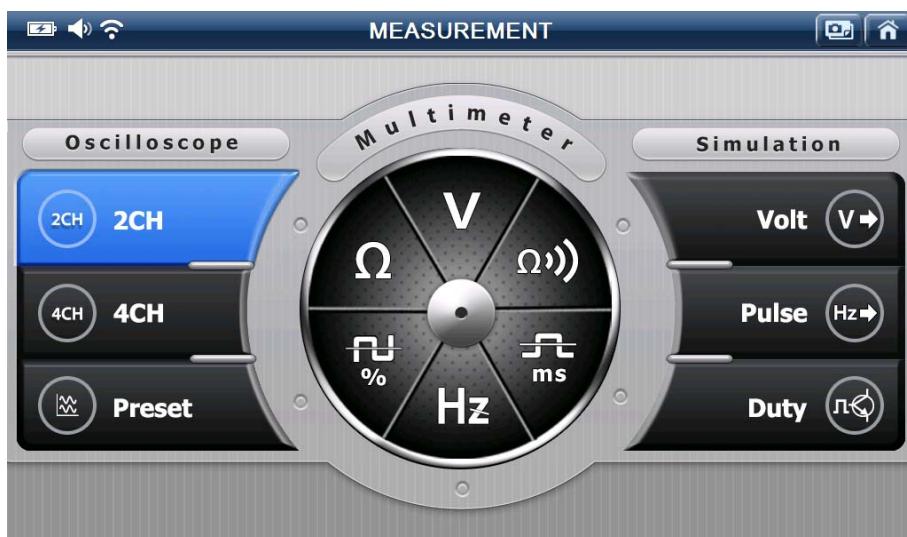
AA-3-5. Measurement

Measurement Function

Utilizing the VMI(Vehicle Measurement Interface) module. G-scan2 provides oscilloscope, multi-meter and simulation functions that are used for measuring the electric signals from the wire directly.



Select the [Measurement] icon from the main menu to run the Measurement Functions, then the Measurement Menu follows as below.



Oscilloscope Function

Measures the voltage or amperage fluctuations of the vehicle's sensor or actuator circuits in rapid repetition and visualizes the signals in the graphic waveforms.

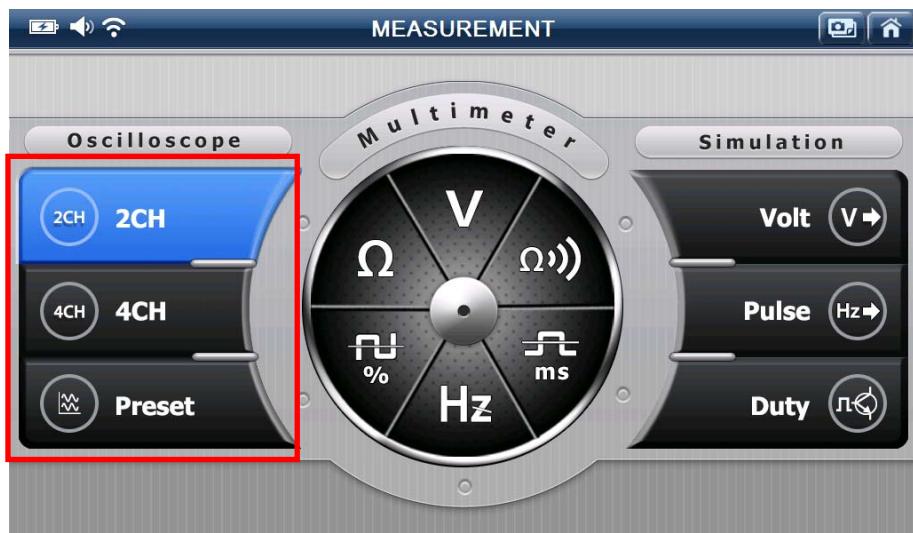
Measurement of cylinder compression is also possible by the use of optional pressure sensor.

The signal input ports of G-scan2 VMI module are assigned to specific measurement functions, so please refer to the following table.

Measurement Function	Assigned Signal Port
Oscilloscope Voltage Waveform	CH A (Red) and CHB (Yellow) ports
Oscilloscope Current (Ampere) Waveform	CH Aux (Blue) port
Compression Pattern	CH B port
Multi-meter Functions	CH B port
Simulation Functions	Voltage Output: CH B port Pulse Output: CH B port Actuator Control: CH A port

* Please note that the Current Clamps for small and large amperage measurement and the pressure sensors are supplied as optional supplies.

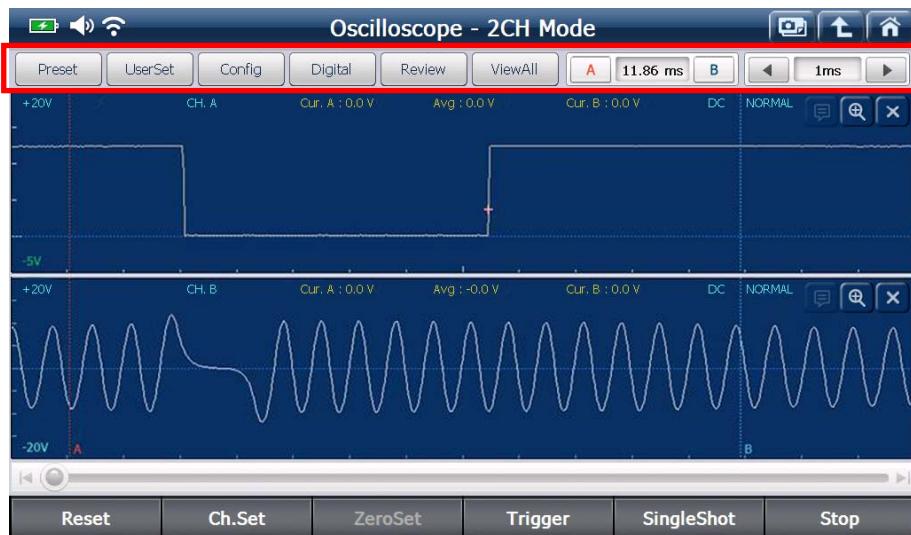
Select the 2CH, 4CH or Preset buttons to run the Oscilloscope function.



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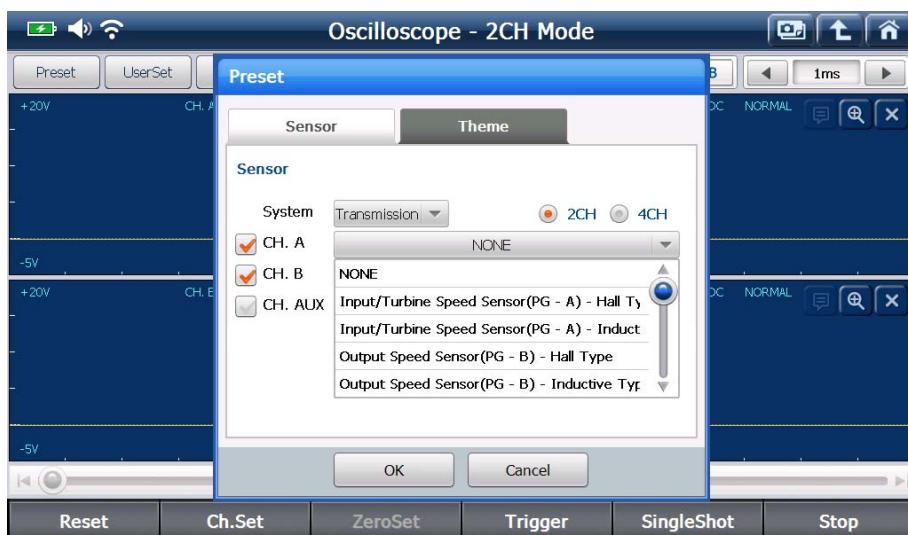
1. Oscilloscope Upper Section Control Menu

When [2CH] is selected from the Measurement Functions menu, the Oscilloscope function runs in 2 Channel mode as shown below.



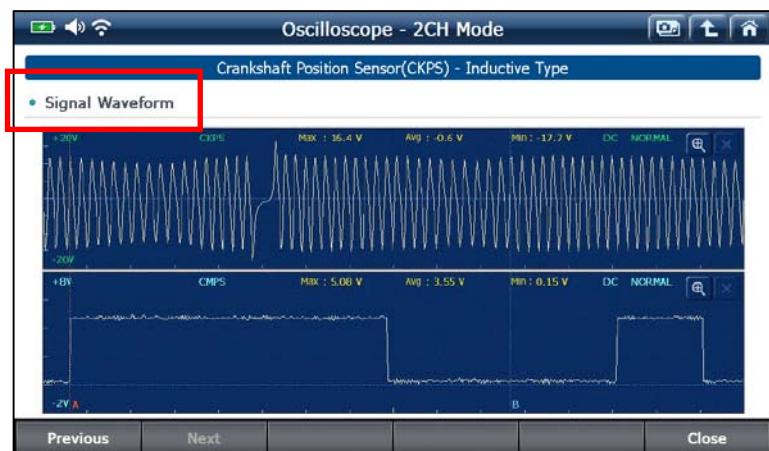
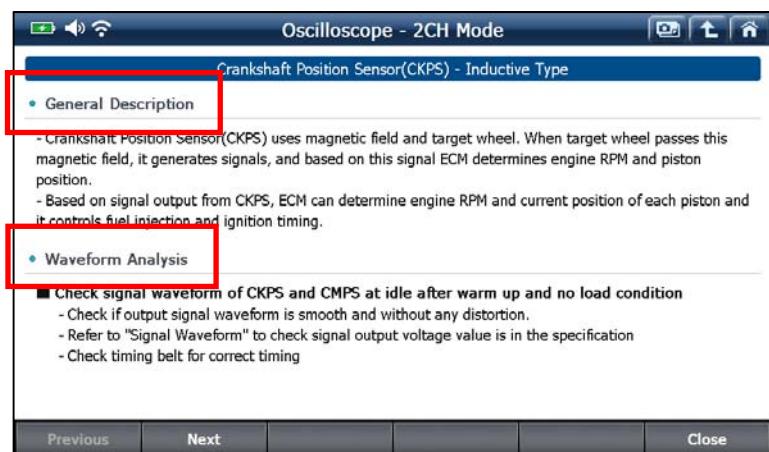
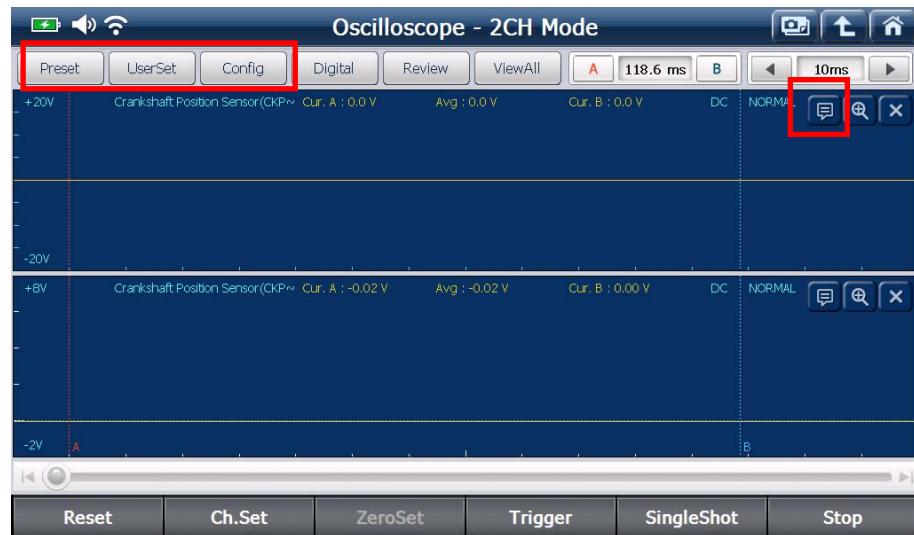
Preset

: The sensors and actuators of Engine and Transmission that are frequently used are listed and the optimal voltage and time division setting are provided for each item as the preset values. Simply select the sensor or actuator name from the list and no manual voltage and time division level adjustment is necessary.



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The [Help Tip] icon is activated when the item is selected from the [Preset] menu, where the general description about the selected sensor/actuator as well as the waveform analysis guide and the reference waveform are provided.



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UserSet

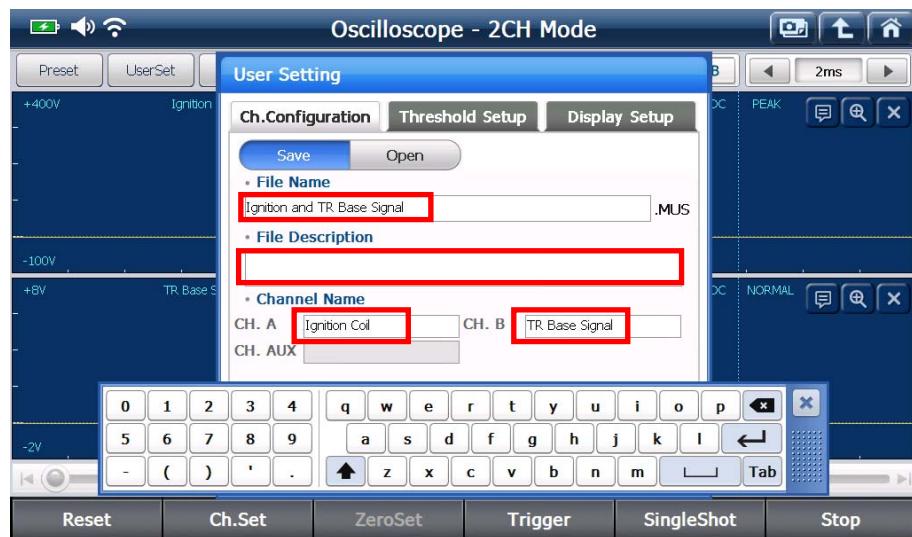
: Opens the User Setting menu where the Channel, Threshold and Display settings can be configured manually.

A. Channel Configuration

Saves the user's current oscilloscope time and voltage settings.

The saved settings can be retrieved from the menu, which enables the oscilloscope setting procedure quick and simple when measuring the same sensor again later.

Input the file name as well as the description about the file and the details of the channels for future reference using the on-screen virtual keypad.



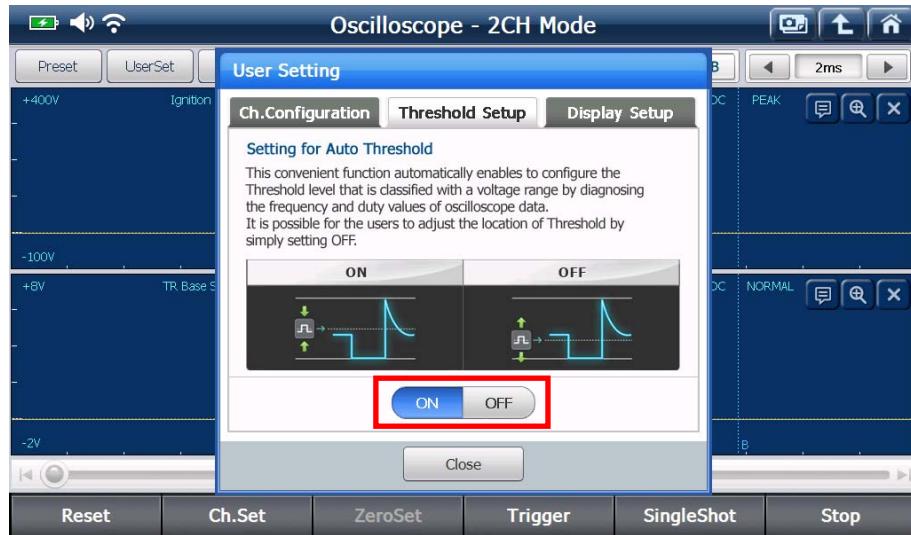
B. Threshold Setup

Threshold level which is used as the reference for measuring the frequency and duty cycle can selected among "50%" or "Manual" setup.

If 'Threshold Setup' is set to "ON", G-scan2 measures the frequency and duty cycle with the threshold level at the 50% of the Y axis value.

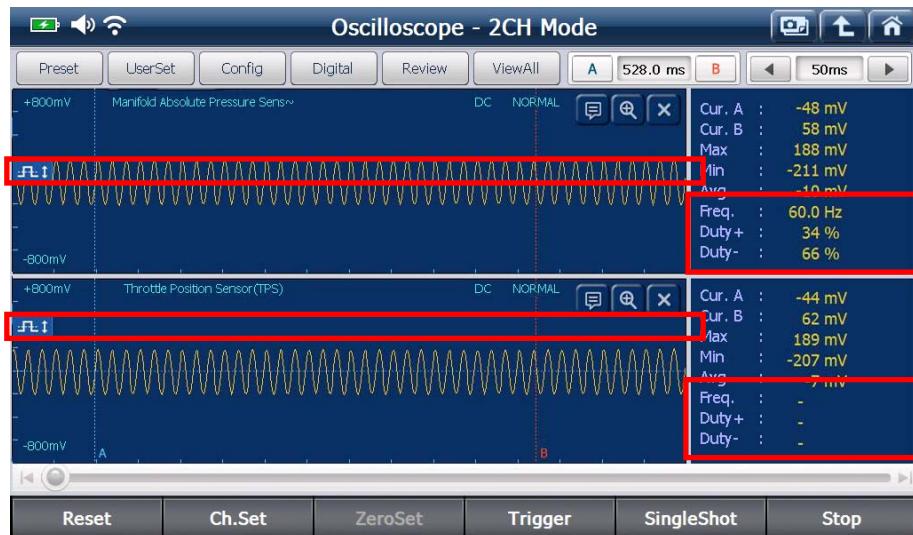
If the frequency or duty cycle is not properly measured, in such cases as measuring the Main Duty Solenoid of some LPG vehicles, the threshold level needs to be manually adjusted. In this case, set "Threshold Setup" to "OFF" then shift the threshold level as needed.

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In the examples below, the same waveforms are displayed in both Channel A and B, however, please note that no frequency and duty readings are indicated in the Channel B, because the threshold level is set out of the range of the Channel B signal.

Threshold level needs to be positioned within the signal range in order to measure the frequency and duty cycle.



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C. Display Setup

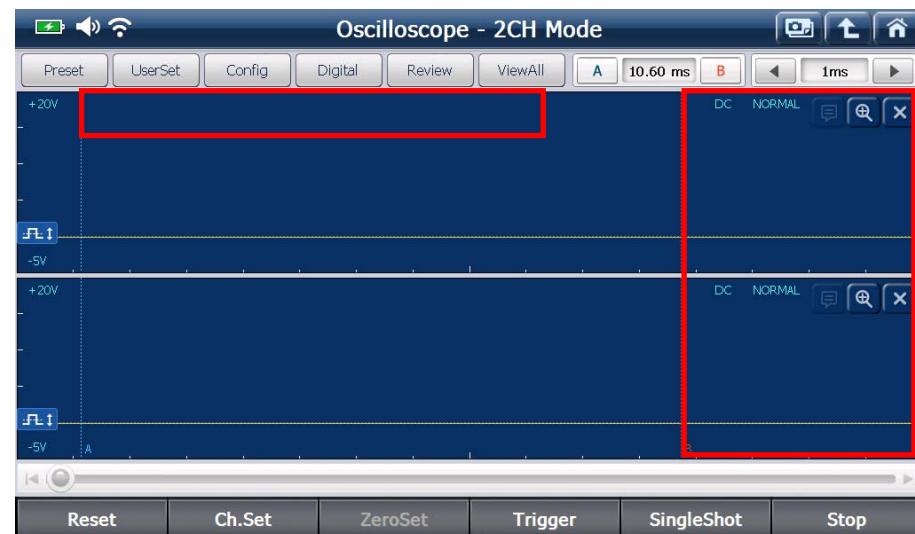
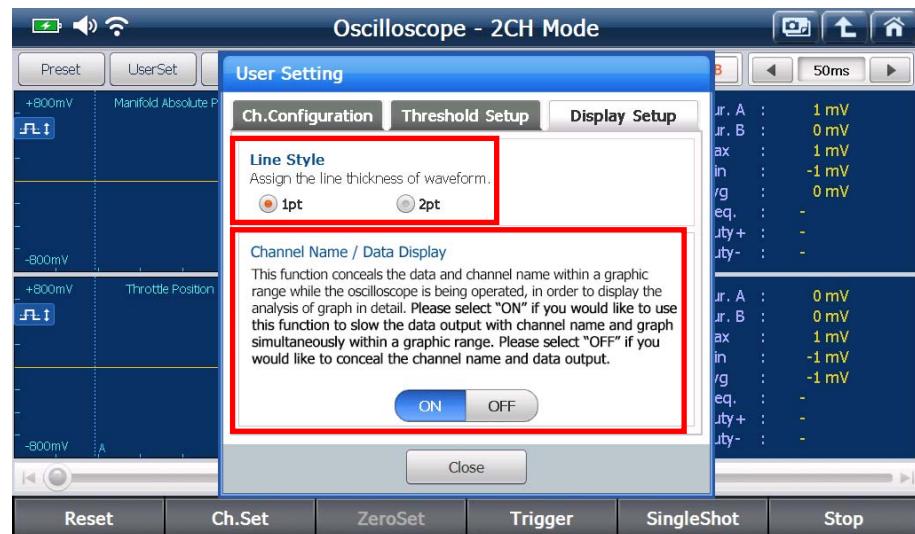
Signal line thickness and the channel name / measurement readout indication settings can be configured.

Line Thickness

Thickness of waveform lines can be selected among 1 point and 2 points.

Channel Name / Measurement Readout

Channel name indication in the top of each channel window and the measurement readouts in the right side of the screen can be toggled ON or OFF.



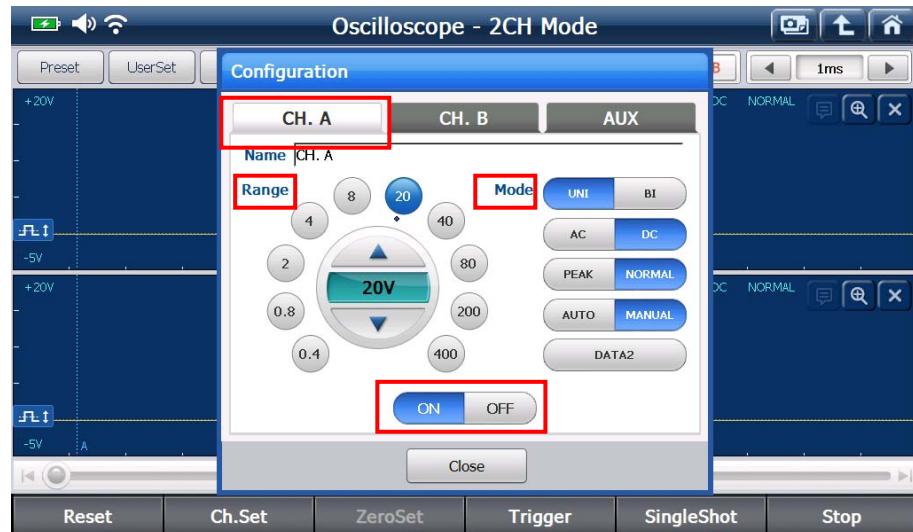
[Channel Name and Measurement Readout turned OFF]

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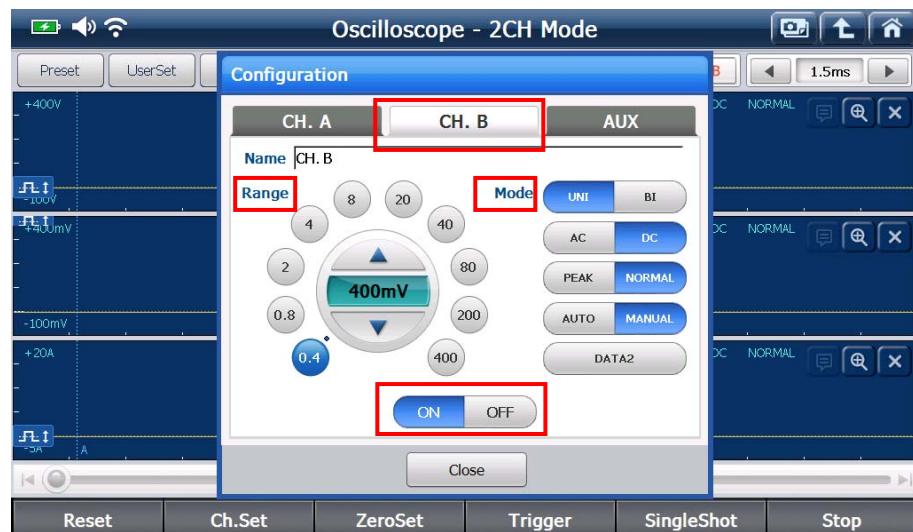
Config

: Changes the settings for each channel.

You can enable or disable the individual channel, and also change the signal range and the settings for each channel.

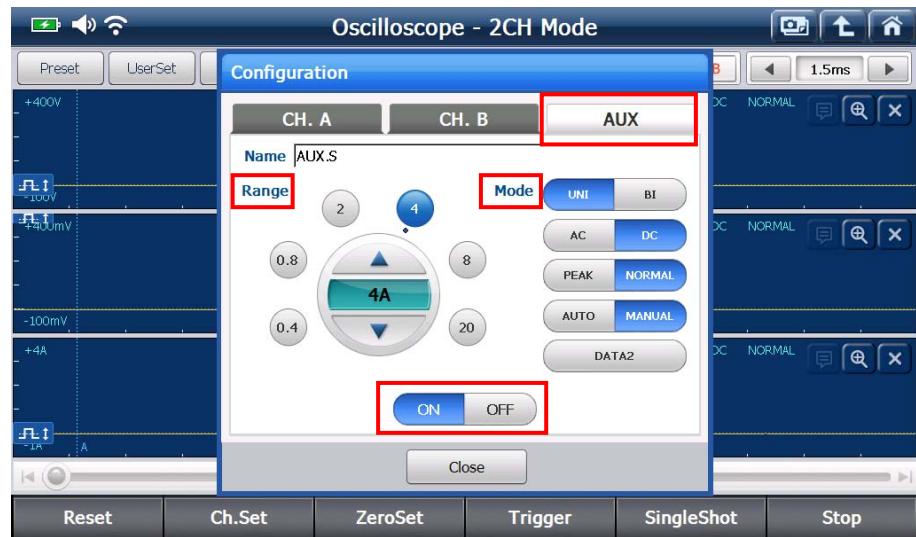


[Configuration for Channel A]



[Configuration for Channel B]

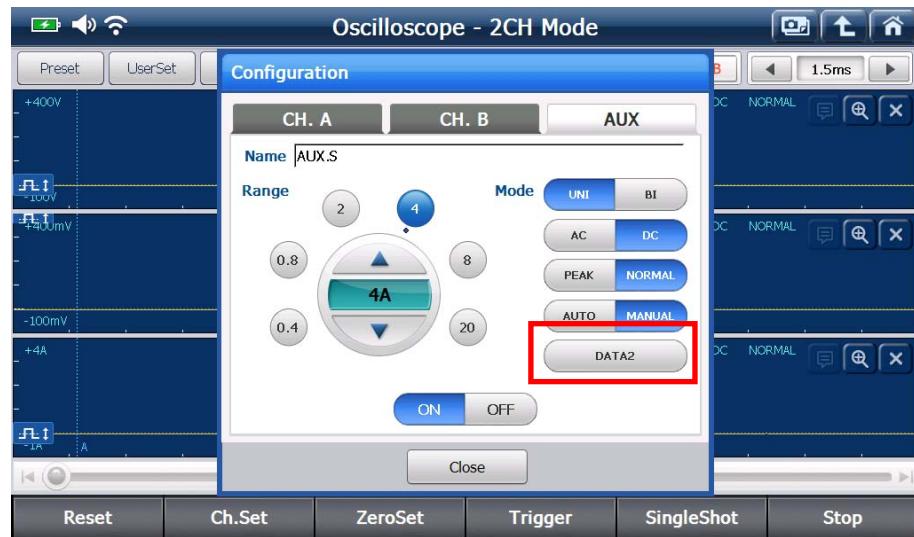
G-scan2 User Manual



[Configuration for AUX]

Configuration Modes	Description
UNI	Centered by 0 level, the waveform is displayed in (+) field only.
BI	Centered by 0 level, the waveform is displayed in both (+) and (-) fields.
AC	Used for measuring the AC voltages (ex. Alternator Diode ripple voltage)
DC	Used for measuring the DC voltage
Peak	Senses and displays the surge voltages when measuring the parts that include the coil, i.e. Ignition coil, Injector and solenoid valves
Normal	Displays the signal according to the sampling speed as configured.
Auto	Automatically adjusts the signal level and displays in UNI mode according to the input signal
Manual	Signal level can be adjusted manually

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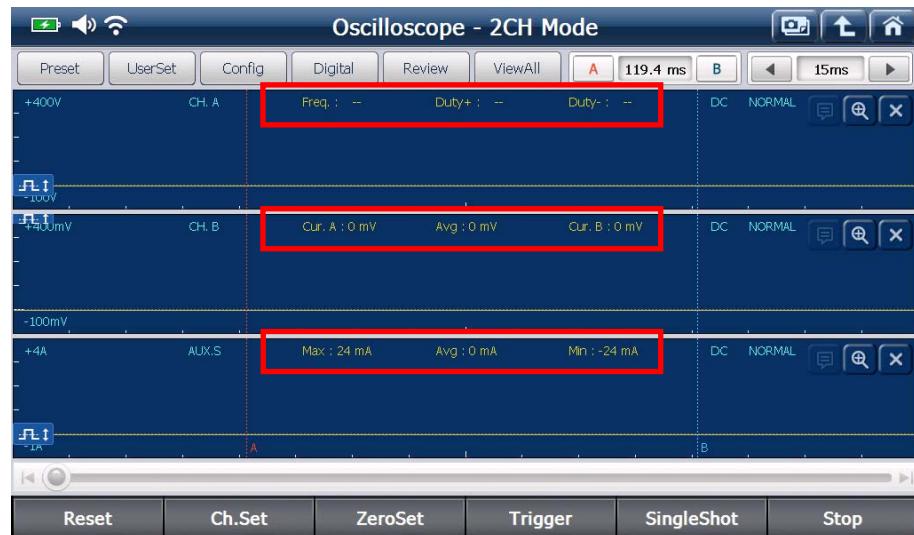


Data 1, 2, 3: Selects among the 3 groups of measurement readouts are indicated in the top of each channel window.

Data 1: Frequency, Duty + and Duty -

Data 2: Cursor A, Average and Cursor B

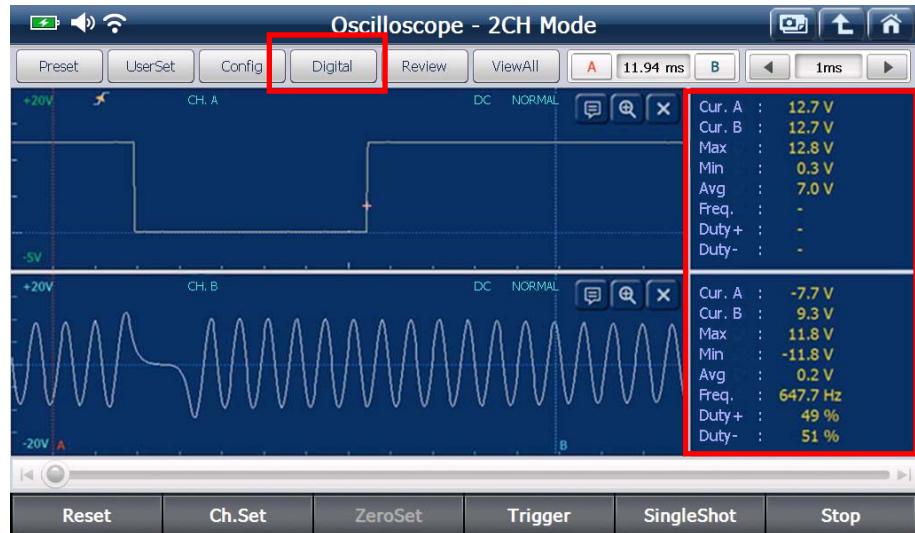
Data 3: Max, Average and Min



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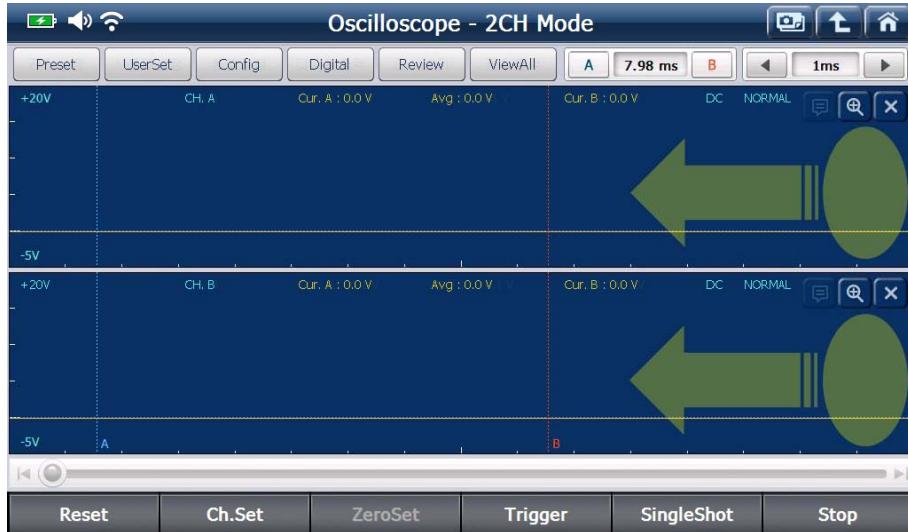
Digital

: Toggles the digital readings On/Off in the right side of the screen.



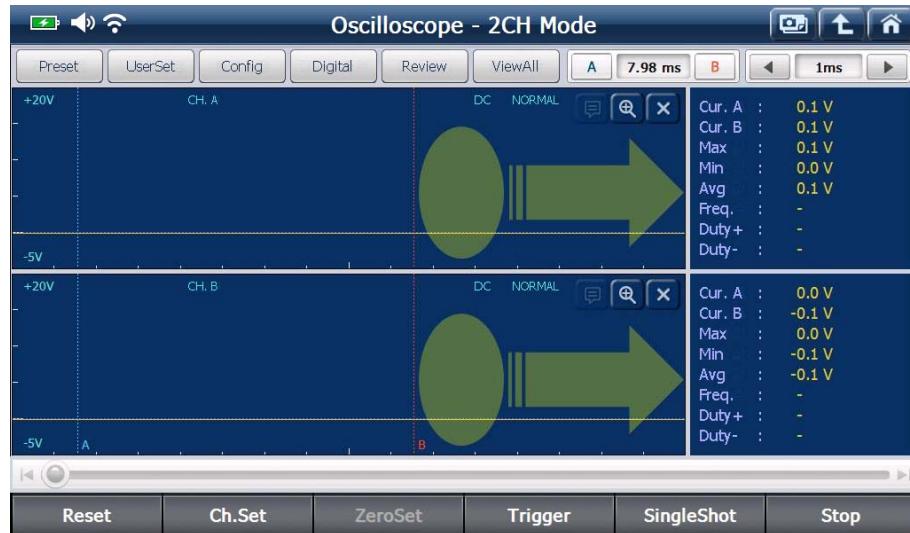
■ Easier way to activate the “Digital Reading”

Touch the yellow circle area on the screen and drag it to the left. Then the digital reading window will be dragged out from the end of the screen.



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Reversely, you can hide the digital readings by touching the center area where marked with yellow circles, then drag it to the right.



Review

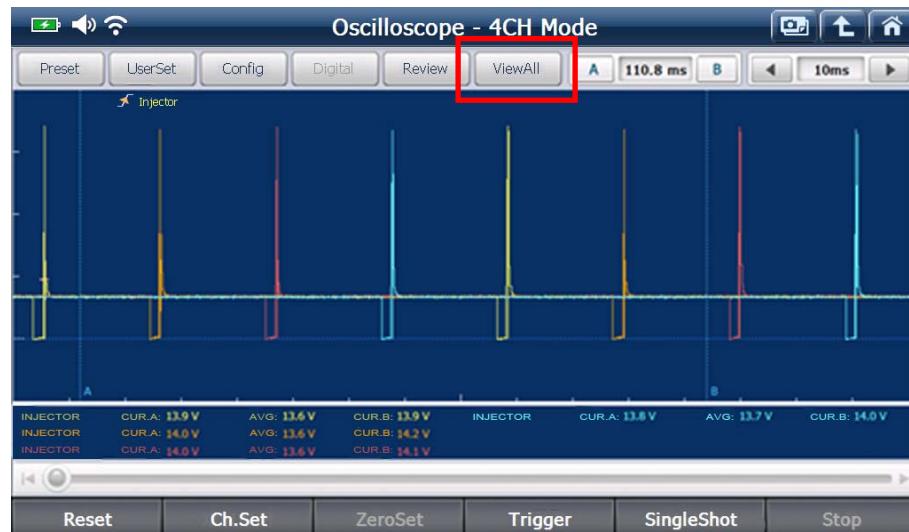
: Saved oscilloscope waveforms can be selected and reviewed..



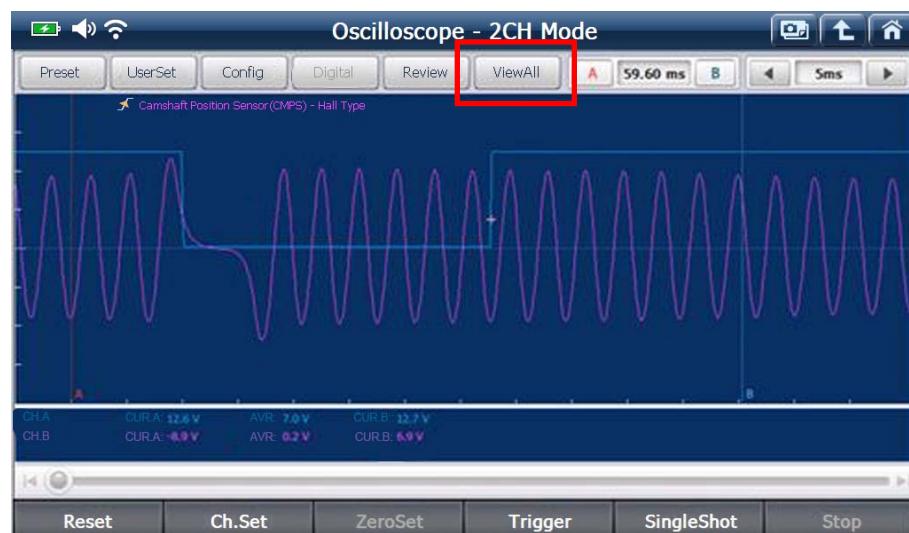
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ViewAll

: Shows the signals of all channels overlapped on the single window which is useful for checking the missing signal or synchronization of the signals.

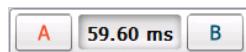


[View All Channels - Injector Synch]



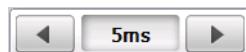
[View All Channels - CMP+CKP Synch]

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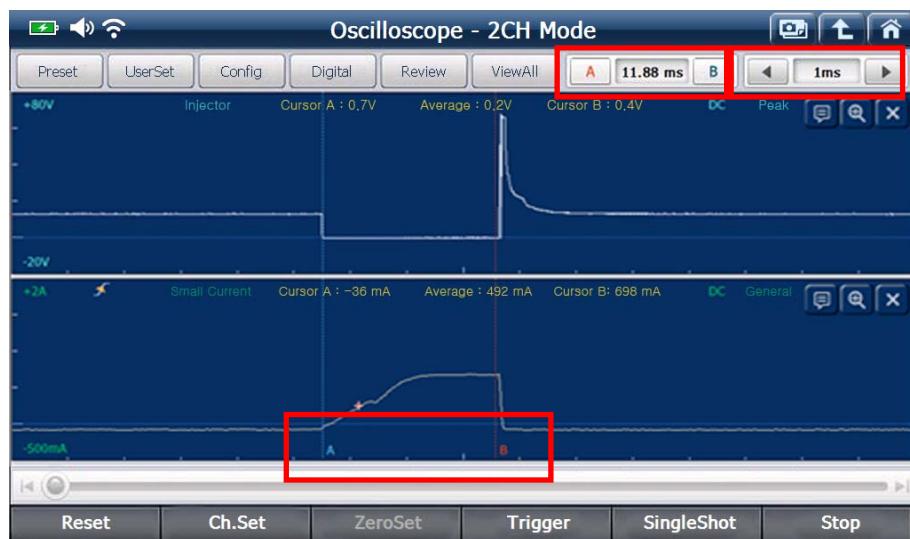


: Indicates the time difference between cursor A and cursor B

Press 'A' or 'B' button, then the selected cursor is indicated by turning to red, and the selected cursor can be moved by touching the desired position on the screen.

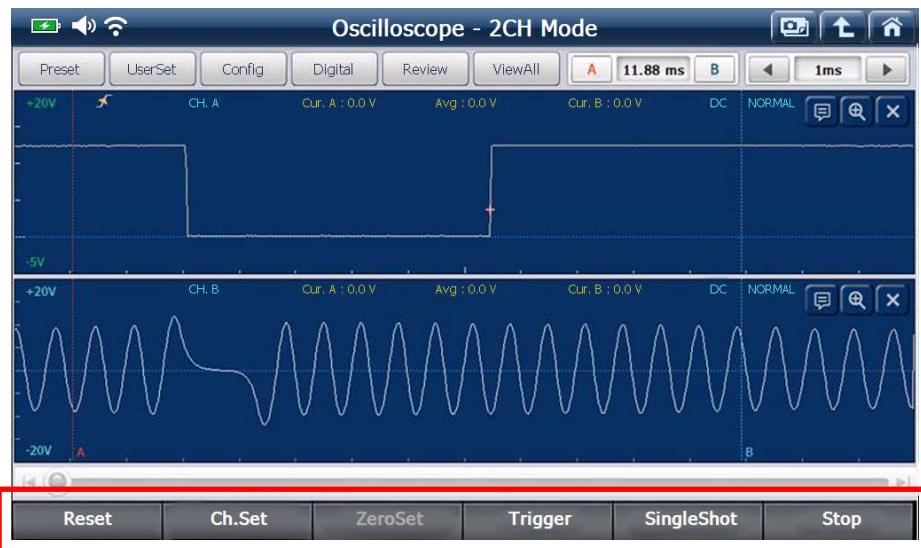


: Time division can be adjusted by using the left-right buttons.



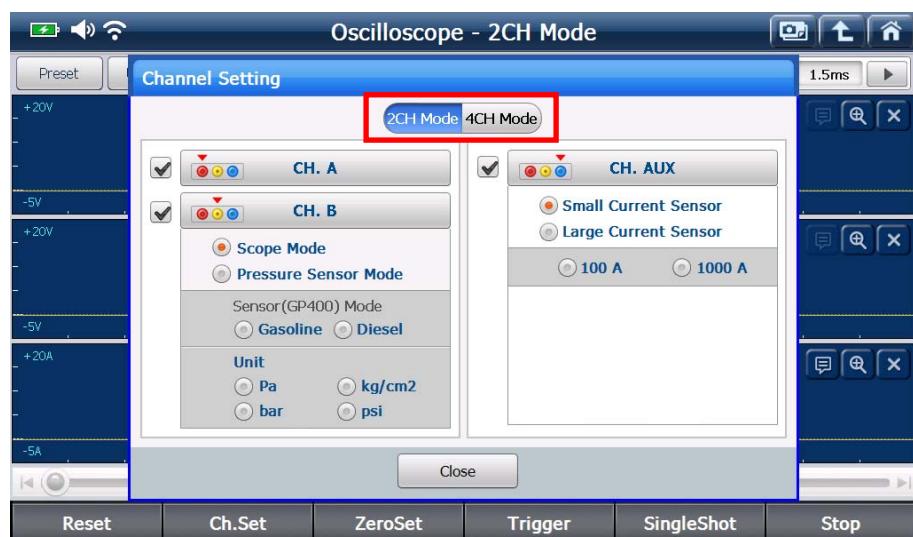
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2. Oscilloscope Lower Section Control Menu



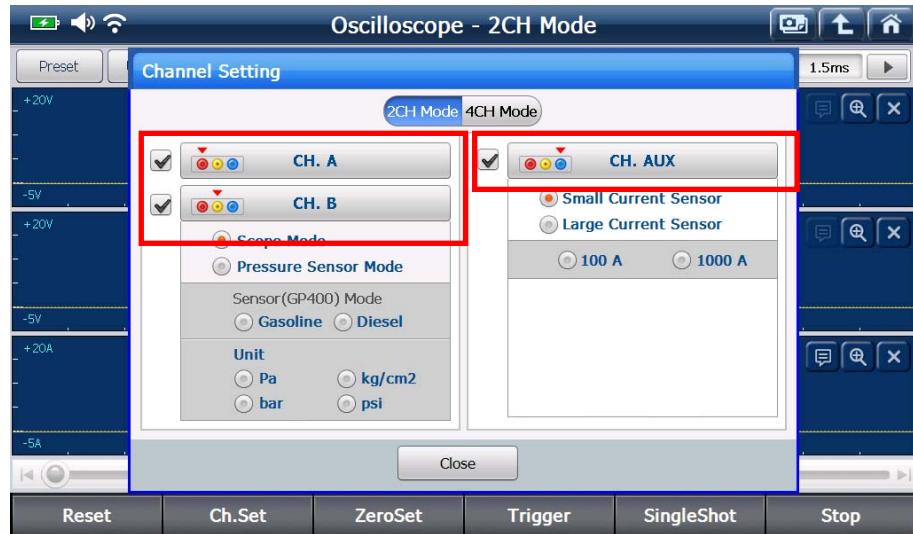
Reset : Cancels the current settings and refreshes the screen.

Ch.Set : Switches to 2 Channel or 4 channel mode.



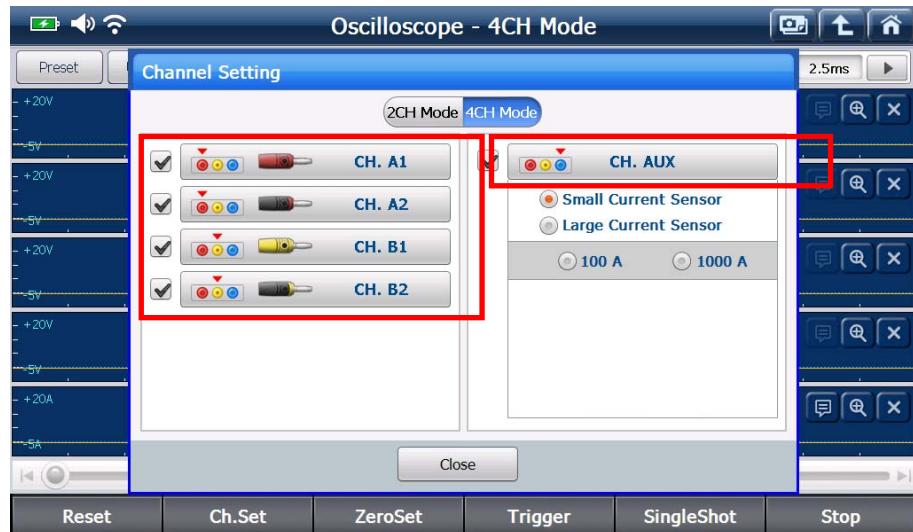
In 2 Channel mode, Channel B can be switched to the scope mode or the pressure sensor mode.

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[Channel Setting – 2CH + AUX mode]

For both 2 CH and 4 CH modes, Channel Aux can be configured for Amperage measurement by selecting the small or large current sensor.



[Channel Setting – 4CH + AUX mode]

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ZeroSet

: Performs zero setting for resistance, small and large current and pressure measurement.



Trigger

: Sets the trigger in 3 modes: Rise, Fall and no trigger.

[Note] “Trigger” is originated from the crossbow or gun’s trigger, which holds the passing waveforms still for a short time when the trigger condition is met.

SingleShot

: Holds the waveform display still when the trigger condition is met until released by the user, which is useful when measuring the fast and non-recurrent events in such cases as TPS + O2 sensor, AFS + TPS or battery voltage when cranking.

Stop

: Holds the displaying the waveform. .

Waveform can be processed for closer analysis or saved for future review.

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Multi-meter Function

G-scan2 provides digital meter function through the VMI that performs the measurement of voltage, resistance, frequency, duty cycle and pulse width as well as the continuity test.

1. Multi-meter Upper Section Control Menu

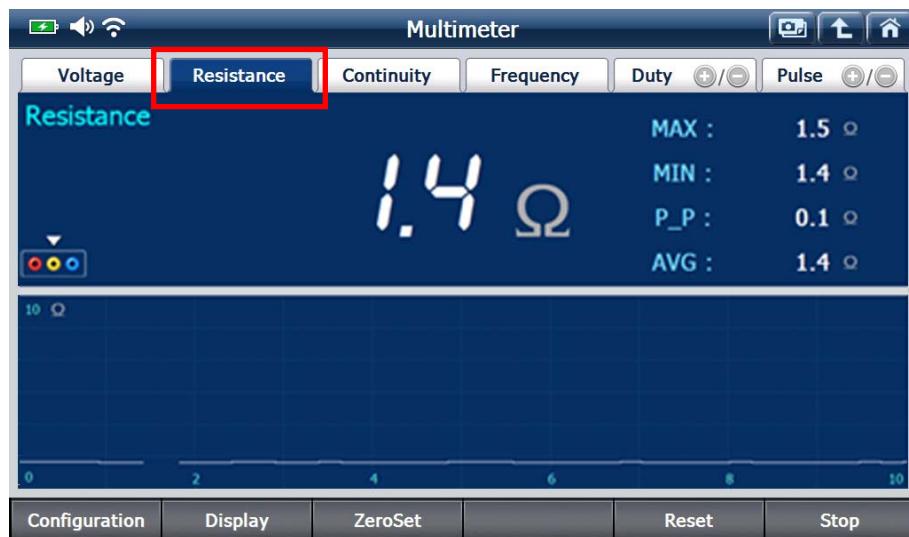
Voltage

: Measures the voltage in the circuit through channel B of the VMI.



Resistance

: Measures the resistance of the circuit or the component through VMI channel B



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Continuity : Conducts the Continuity Test on the circuit.

If the circuit is normal and not open, high tone buzzer sounds and the resistance is indicated.



[Continuity Test – Normal / Buzzer Sounds]



[Continuity Test – Open Circuit / Buzzer Off]

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Frequency : Measures the frequency of the input signal through the VMI channel B.



Duty : Measures the duty of the input signal through VMI channel B. Toggle the polarity of the pulse by selecting [+] or [-].



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Pulse  : Measures the pulse width of the input signal through the channel B of the VMI.

Pulse [+] and [-] values changed when selecting either [+] or [-].



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2. Multi-meter Lower Section Control Menu

Configuration

: Multi-meter function settings can be configured.

Guide for resistance meter calibration, continuity test buzzer and the related data display when measuring Frequency / Duty / Pulse can be enabled or disabled..

Also the line thickness of the graphing meter function that is presented in the lower half of the multi-meter screen can be selected among 1, 2, 3 or 4 point(s).

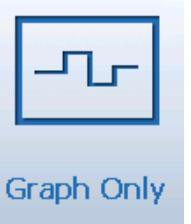


Display

: The proportion of the main digital readout, graphing meter and the reference data that appear in the combo display can be selected according to the user's preference.



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Display Set				
Description	Main digital meter readout only	Main digital meter readout and the reference data	Graphing meter pattern only	Main digital readout and the graphing meter pattern

ZeroSet

: Conducts the meter calibration for resistance measurement.

Calibration is recommended before measuring the resistance, please follow the on-screen guide to do the calibration. The calibration guide can be disabled from the configuration button in the bottom.



Reset

: Resets the measured values and the min, max and average data.

Stop

: Stops the measurement

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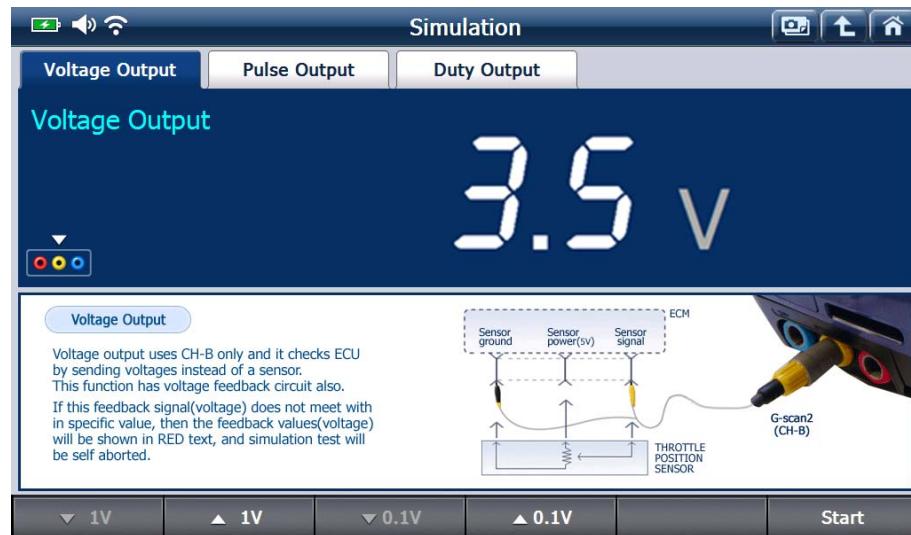
Simulation Function

G-scan2 can actively send out the electric signals to the vehicle's sensor or actuator circuit for in-depth diagnostic purposes.

1. Voltage Output

Sends out the continued voltage signal to the circuit through the VMI channel B, and the voltage level can be manually adjusted by the user. Mainly used for checking the sensor signal wire.

Please observe the instruction displayed in the lower half of the G-scan2 screen.



<< x 1V : Lowers the output voltage by 1V

>> x 1V : Raises the output voltage by 1V

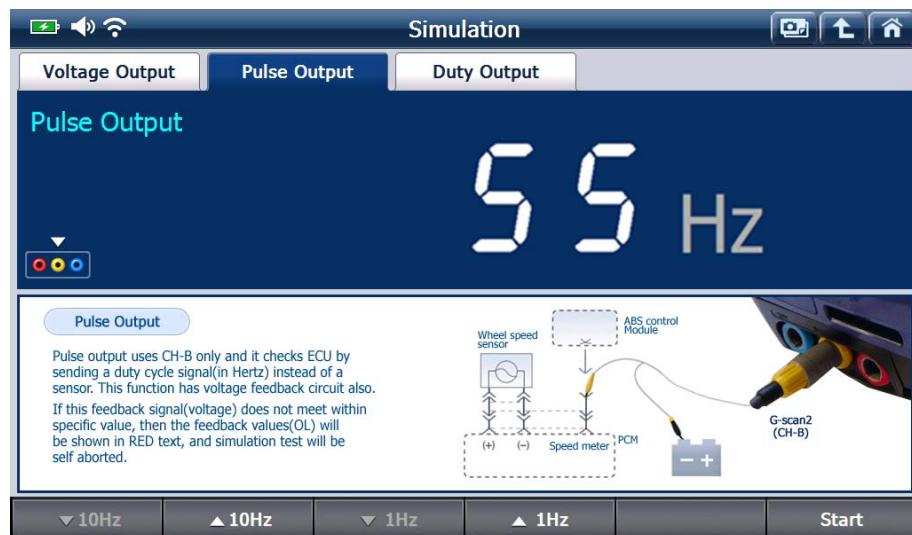
< x 0.1V : Lowers the output voltage by 0.1V

> x 0.1V : Raises the output voltage by 0.1V

Stop : Stops the voltage output

2. Pulse Output

Sends out the 5V pulse signal of the frequency as controlled by the user up to 1kHz through VMI channel B. Mainly used for checking the digital signal sensors like wheel speed sensor.



<< x 10Hz : Lowers the pulse frequency by 10Hz

>> x 10Hz : Raises the pulse frequency by 10Hz

< x 1Hz : Lowers the pulse frequency by 1Hz

> x 1Hz : Raises the pulse frequency by 1Hz

Stop : Stops the pulse output

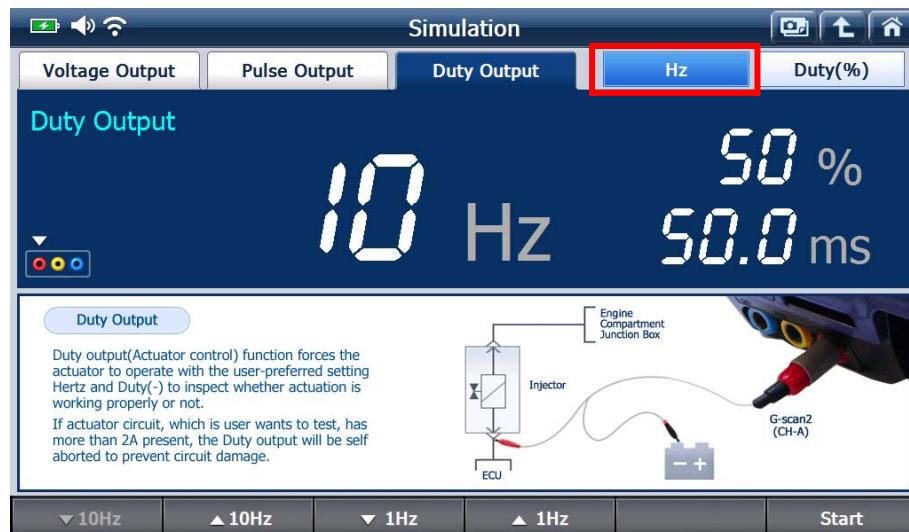
G-scan2 User Manual

3. Duty Output

Conducts the test on the actuators such as injectors by sending out the signals of frequency and duty as controlled by the user, through the VMI channel A.

A. Hz

Select Hz button to adjust the frequency of the output duty signal.



<< x 10Hz : Lowers the pulse frequency by 10Hz

>> x 10Hz : Raises the pulse frequency by 10Hz

< x 1Hz : Lowers the pulse frequency by 1Hz

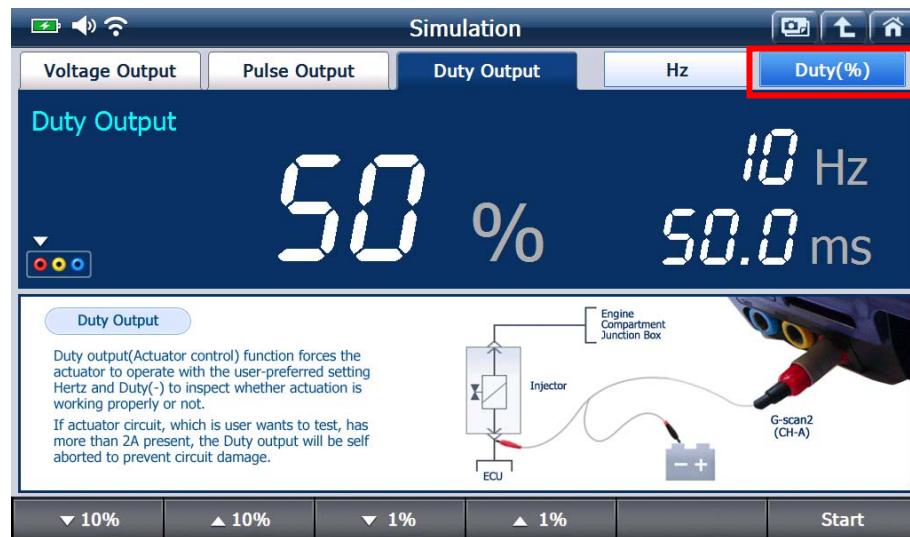
> x 1Hz : Raises the pulse frequency by 1Hz

Stop : Stops the duty output

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B. Duty (%)

Select Duty (%) button to adjust the duty cycle of the output signal.



<< x 10% : Lowers the output duty cycle by 10%

>> x 10% : Raises the output duty cycle by 10%

< x 1% : Lowers the output duty cycle by 1%

> x 1% : Raises the output duty cycle by 1%

Stop : Stops the duty output



3.6. Favorite



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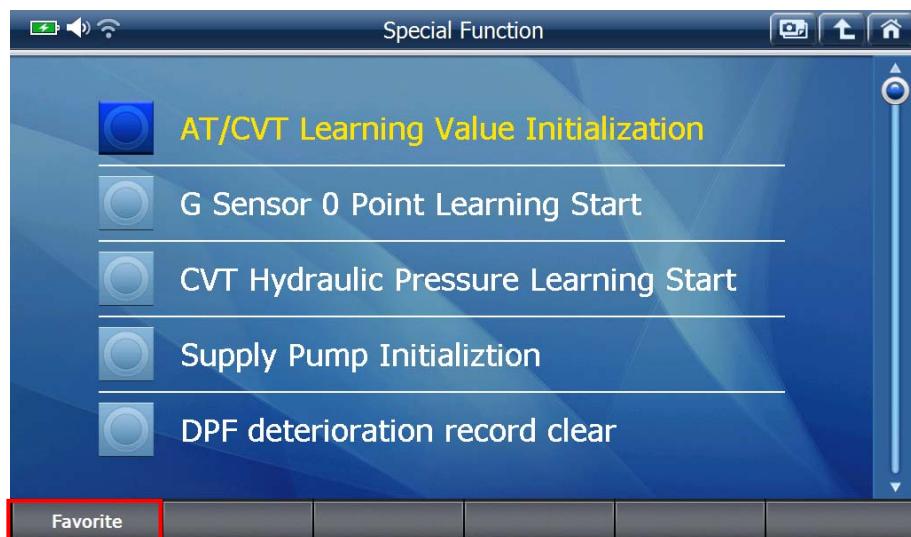
AA-3-6. Favorite

Favorite

The special functions of the specific vehicle models that are frequently used can be added to the favorite list where the listed functions can be simply executed having to make the whole lot of vehicle details selecting procedures.

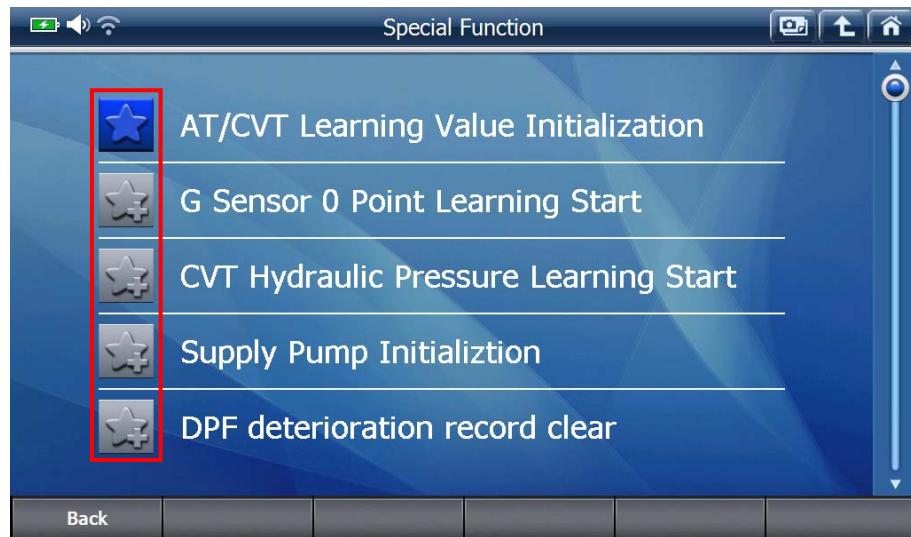
1. Adding the function to the list

Add a special function to the favorite list by selecting “Favorite” or pressing the [F1] key from the special functions menu.



The function names are marked with the Star or Star+ marks.

Marks	Description
	The special function has been added to the favorite list already.
	The special function is not listed, and can be added to the favorite list.



Select the special function with the Star+ mark , then the function is added to the favorite list with your confirmation.



When done, exit the Favorite List control menu by selecting “Back” or pressing the [F1] key.

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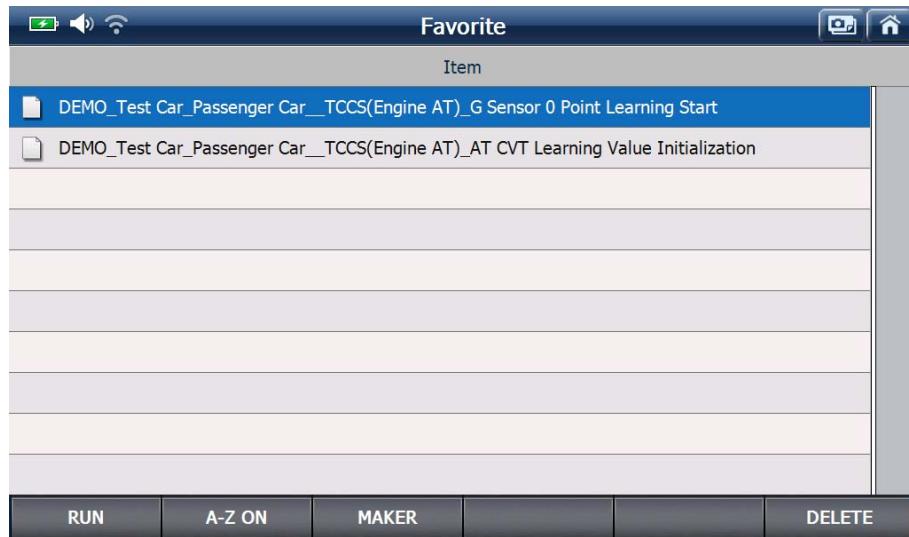
2. Loading the favorite list

Select “Favorite” icon from the main menu, then the folders are listed as shown below.



Folder	Description
Recents	The advanced functions that have been recently used are listed automatically.
“Manufacturer name”	The advanced functions that the user has manually added as the Favorite functions are listed in the car manufacturer name folders.

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Select one among the list and select “OPEN” or press the [F1] key to start the function.

The selected function will be executed directly from this list without having to make any further selections.

Select “MAKER” or press the [F3] key to return to the folder selection menu.

Select “DELETE” or press the [F6] key to remove the selected special function from the list.