CA15 Scope Meter
Instruction Manual

Safety Guide:

◎ This unit is powered by battery (18650 Li-ion Battery).
   Please install the proper battery before powering up the device.

◎ Sensor cable is only designed for Scope Meter testing ususage. DO NOT use the cable
   for other purpose.

◎ The Device is only designed for working temperature environment
   between 0 - 50 Celsius or 32 – 122 Fahrenheit.

◎ Please DO NOT expose this device to extreme moisture nor clean face plate
   by applying any liquid directly to the face plate. If any liquid permeates into the device,
   shut down the device immediately.

◎ If any dirt on the screen, please apply mild cleaner on soft cleaning cloth to clean.

◎ DO NOT hit or drop the device.

◎ DO NOT disassemble the device or remove the back panel of the device.

◎ Please follow the instructions stipulated within this manual for operating
   this device safely.

Product Specification

CA 15 Specificaiton

◎ Working Voltage: 3.6V
◎ Working Current: 600mA
◎ Working Tempurature: 0 - 50 Celsius
◎ Dimension: 33mm(H)*185mm(W)*285mm(L)
◎ Product Weight: 730g

CA15 Functional specification

◎ Measuring Voltage: AC250V
                                      DC220V

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Operation

● Power On/Off

An On/Off switch on the left-top side of the device.

ON [||||||||] OFF
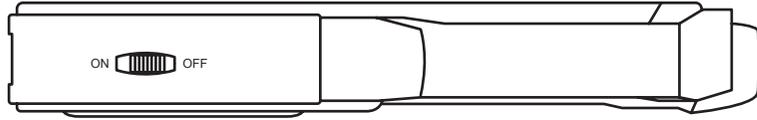
A set of positive/negative ports on the top of the device. Please plug the probes into the corresponding ports accordingly before measuring.
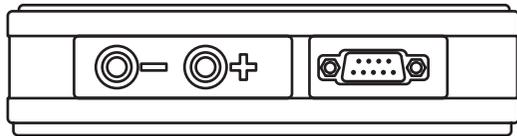
▲ ▼:UP and DOWN buttons are used for modify the volume of the Y-axis.
◄ ►:RIGHT and LEFT buttons are used for modify the volume of the X-axis.
ENTER: Use this button to select the currently highlighted option to be executed.
EXIT: Use this button to leave the current page.
Numbers:0~9
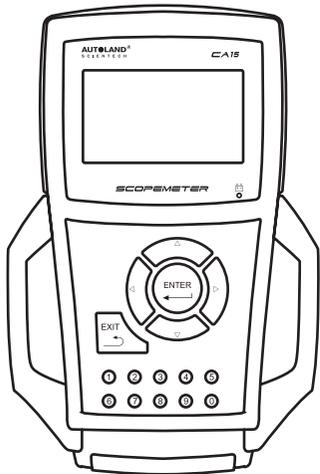
● Instruction of Multimeter

DCV
DCV measurement

Multimeter

Scope

V	DCV
Ω	OHM
⊣⊢	Circuit Short Test
‖‖‖	Frequency(Hz)

Max：14.91V   Min：14.89V

14.90V

Please press 'EXIT' key to exit
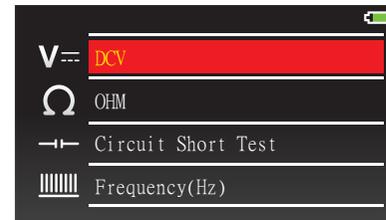
Entering DCV to measure.
Max & Min represents a maximum and minimum voltage within a period of time. User can increase the length of time for measuring in the SETTINGS page.

OHM
OHM Measurement
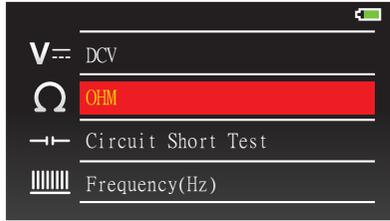
Connect positive and negative probe and then press ENTER to calibrate when entering OHM, then to measure resistance.

Touch two probes together
(follow the picture as blow)

press 'ENTER' key to Start

0.00 Ω

Please press 'EXIT' key to exit

Please press 'EXIT' key to exit
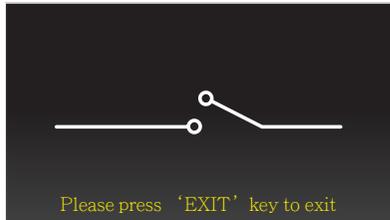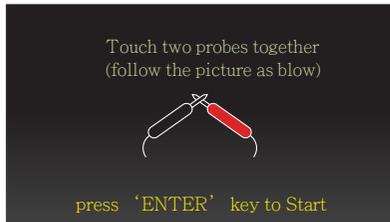
When measuring resistance, if the circuit short happens, the screen will show image of circuit short.
※ Attention: OHM is only for measuring resistance in Ohm. Please DO NOT attempt to measure any other type of value under this setting.

Circuit Short Test

Please press 'EXIT' key to exit
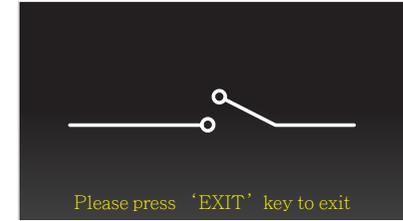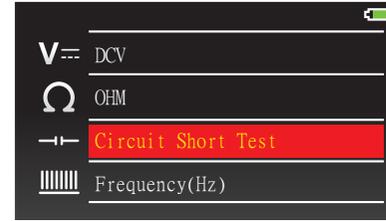
When entering Circuit Short Test the screen will display the circuit short image. By selecting the above option the user will enter the Circuit Short Test.

Please press 'EXIT' key to exit
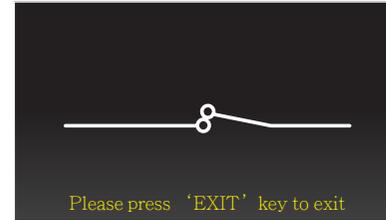
Circuit Short Test: When the circuit is connected, the image will change to a complete loop and the device will make "beeping" sounds.

Frequency(Hz)
Frequency Measurement

V⎓	DCV
Ω	OHM
⊣⊢	Circuit Short Test
▥	Frequency(Hz)

Signal measuring for Sensors only, Do not test with compoments like Ignition primary, Injection signals the measured result might be incorrect.

Please press 'ENTER' key to Start

Max：0Hz   Min：0Hz

0   Hz

Please press 'EXIT' key to exit
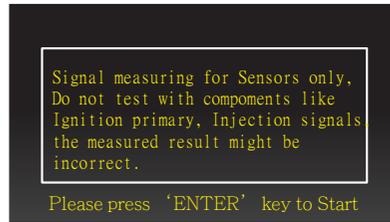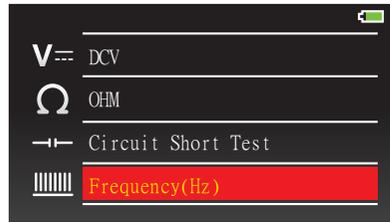
Enter Frequency (Hz) and connect positive probe (Red) with sensor and the negative probe (Black) with chassis ground of the vehicle in order to measure frequency.

Duty/Cycle (%)
Duty/Cycle Percentage Measurement

⊓⊔	Duty/Cycle(%)
⌐⌐	Active Time(mS)
⌐⌐°	Ignition Dwell
A	Amp

Signal measuring for Sensors only, Do not test with compoments like Ignition primary, Injection signals the measured result might be incorrect.

Please press 'ENTER' key to Start

Max：0.00%   Min：0.00%

0.00 %

Please press 'EXIT' key to exit
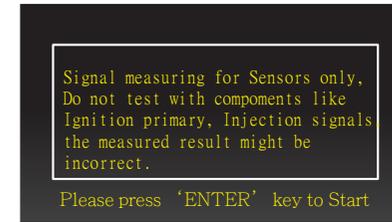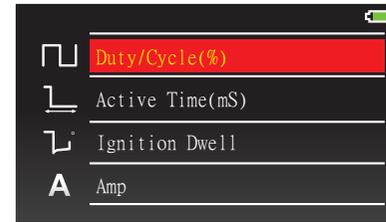
Enter Duty/Cycle (%) and connect positive probe (Red) with sensor and the negative probe (Black) with chassis ground of the vehicle in order to measure the percentage.

Active Time (mS)
Activation Time Measurement

Duty/Cycle(%)
Active Time(mS)
Ignition Dwell
A Amp

Signal measuring for Sensors only,
Do not test with compoments like
Ignition primary, Injection signals
the measured result might be
incorrect.

Please press 'ENTER' key to Start

Max :0.00mS   Min :0.00mS

0.00mS

Please press 'EXIT' key to exit
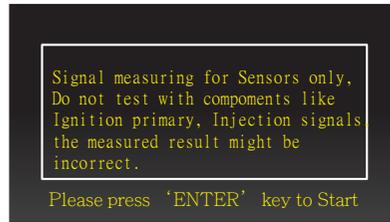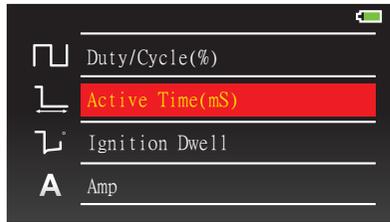
Enter Activation Time and connect positive probe (Red) with sensor and the negative probe (Black) with chassis ground of the vehicle in order to perform measurement.

Ignition Dwell
Ignition Dwell Measurement

Duty/Cycle(%)
Active Time(mS)
Ignition Dwell
A Amp

Setting
Ignition Type：Single Direct
                        Ignition System
Yes   No
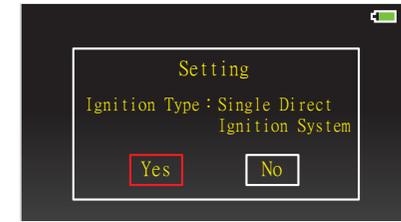
Confirm ignition type and quantity of cylinder when entering to measure inginition dwell. Enter proper setting if the original setting is different from the testing vehicle.

Max   :360.00 Deg   Min 360.00 Deg
Active :100.00mS

360.00°

Please press 'EXIT' key to exit

Enter Ignition Dwell and connect positive probe (Red) with sensor and the negative probe (Black) with chassis ground of the vehicle in order to perform measurement.

Amp.
Measuring the magnitude of current.
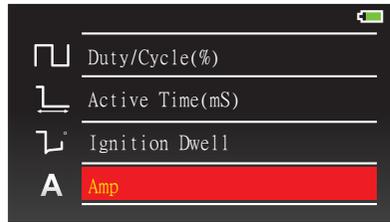
Please connect AC/DC Current clamp (OPTIONAL)
There are 1mV/100mA and 1mV/10mA conditions on Current clamp meter.

Please select proper condition for the Current clamp measurement, for example in order to measure 1mV=0.01A with CA15, move the switch to the 1mV/10mA on Current clamp.

In order to measure the Current accurately press the ZERO button on the current before performing the measurement.

Temperature
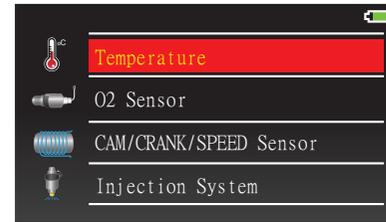
Temperature Module is under development.

O2 Sensor
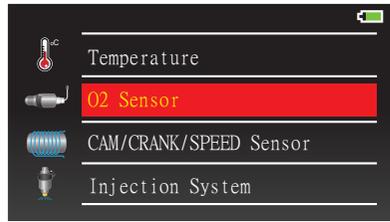
| Temperature |
| O2 Sensor |
| CAM/CRANK/SPEED Sensor |
| Injection System |

Max: 0.01V   Min: 0.01V

0.01 V

Please press 'EXIT' key to exit

Enter O2 Sensor and connect positive probe (Red) with sensor and the negative probe (Black) with chassis ground of the vehicle in order to measure O2 Sensor Voltage.

CAM/CRANK/SPEED Sensor

| Temperature |
| O2 Sensor |
| CAM/CRANK/SPEED Sensor |
| Injection System |

0 Hz
0.00 V

Please press 'EXIT' key to exit
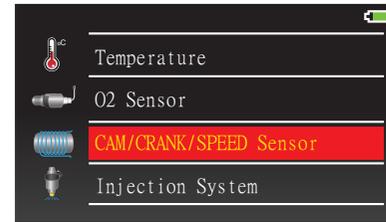
Enter CAM/CRANK/SPEED Sensor and connect positive probe (Red) with sensor and the negative probe (Black) with chassis ground of the vehicle in order to perform measurement.
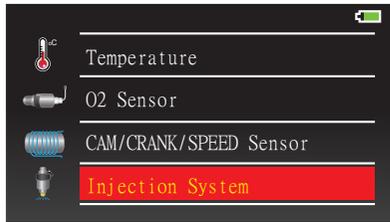
Injection System

Enter Injection System to select display mode: Injection Time (number).

Max 59.99V   Min : 0.76 V
Coil Power 14.56V

2.01mS

Please press 'EXIT' key to exit

Enter Injection System to select display mode: Injection Time Scanwaveform (waveform).
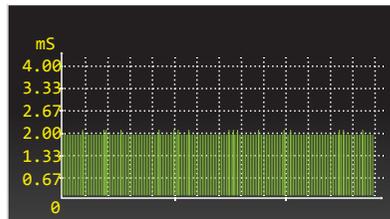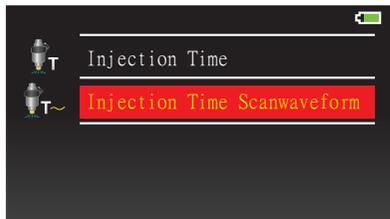
Enter Injection System and connect positive probe (Red) with sensor and the negative probe (Black) with chassis ground of the vehicle in order to perform measurement.

Ignition System

Enter Ignition System to select display mode: Ignition Dwell.

Setting

Ignition Type : Single Direct Ignition System

Yes   No
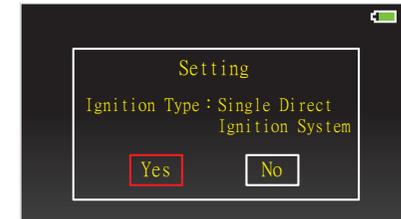
Confirm ignition type and number of cylinders when entering to measure ignition dwell.

18.54°
3.33 V

Please press 'EXIT' key to exit

Enter Ignition System to select display mode: Ignition Scanwaveform.

| Ignition Dwell |
| Ignition Scanwaveform |
| RPM |

Confirm Ignition type and number of cylinders when entering to measure Inginition Dwell Angle.

Setting
Ignition Type：Single Direct
Ignition System
Yes   No

角度
60.0
40.0
20.0
0
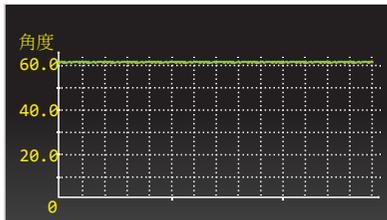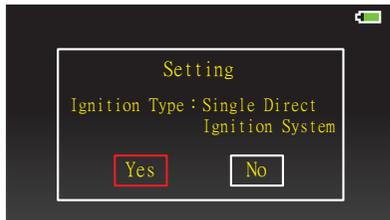
Enter Ignition System to measure RPM.
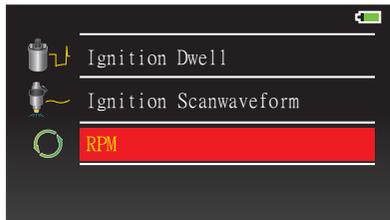
| Ignition Dwell |
| Ignition Scanwaveform |
| RPM |

Confirm Ignition type and number of cylinders when entering to measure RPM.

Setting
Ignition Type：Single Direct
Ignition System
Yes   No

0 RPM
Please press 'EXIT' key to exit
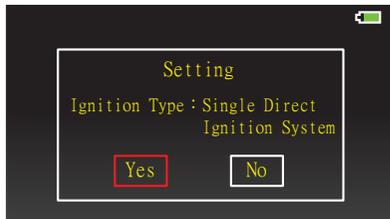
Enter RPM and connect positive probe (Red) with sensor and the negative probe (Black) with chassis ground of the vehicle in order to perform measurement.

Setup
Enter Setup to view and modify current settings.

| Ignition System |
| Setup |

Setting
1.Ignition Type   : Single Direct
                         Ignition System
2.Sleep Mode   : 5 Minutes
3.DCV Refresh Time   : 5 Seconds
4.Frequency Refresh Time : 5 Seconds
5.Duty Refresh Time   : 5 Seconds
6.Active Refresh Time : 5 Seconds
press 'ENTER' key to change setting

Ignition Type Setting

| Ignition Type Setting |
| Sleep Mode Setting |
| DCV Refresh Time |
| Frequency Refresh Time |

Select Ignition type: Single Direct Ignition System
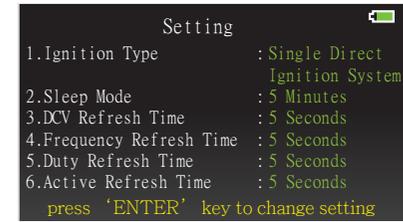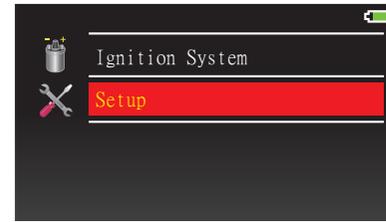
| Distributor |
| Single Direct Ignition System |
| Dial Direct Ignition System |
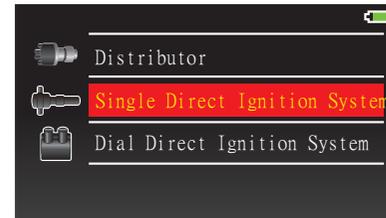
Sleep Mode Setting
Use this option to automatically power off the unit in order to make your battery charge to last.

| Ignition Type Setting |
| Sleep Mode Setting |
| DCV Refresh Time |
| Frequency Refresh Time |

| off |
| 5 Minutes |
| 10 Minutes |
| 15 Minutes |

DCV Refresh Time

Ignition Type Setting	V— 5 Seconds
Sleep Mode Setting	V— 25 Seconds
DCV Refresh Time	V— 45 Seconds
Frequency Refresh Time	V— **1 Minutes**

Frequency Refresh Time
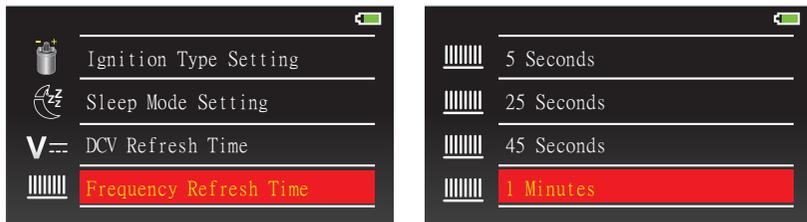
Ignition Type Setting	▥ 5 Seconds
Sleep Mode Setting	▥ 25 Seconds
DCV Refresh Time	▥ 45 Seconds
Frequency Refresh Time	▥ **1 Minutes**

Duty Refresh Time
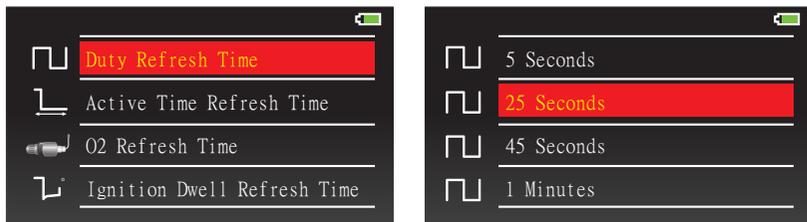
Duty Refresh Time	⊓ 5 Seconds
Active Time Refresh Time	⊓ **25 Seconds**
O2 Refresh Time	⊓ 45 Seconds
Ignition Dwell Refresh Time	⊓ 1 Minutes

Active Time Refresh Time
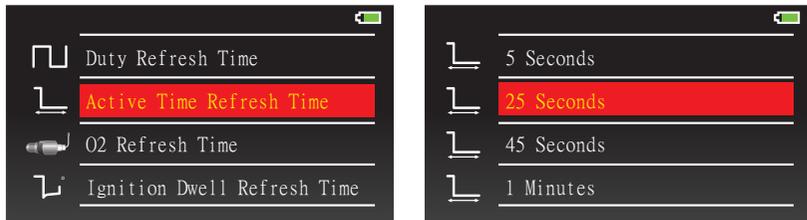
Duty Refresh Time	⌐ 5 Seconds
Active Time Refresh Time	⌐ **25 Seconds**
O2 Refresh Time	⌐ 45 Seconds
Ignition Dwell Refresh Time	⌐ 1 Minutes

O2 Refresh Time

Duty Refresh Time	5 Seconds
Active Time Refresh Time	**25 Seconds**
O2 Refresh Time	45 Seconds
Ignition Dwell Refresh Time	1 Minutes

Ignition Dwell Refresh Time

Duty Refresh Time	5 Seconds
Active Time Refresh Time	**25 Seconds**
O2 Refresh Time	45 Seconds
Ignition Dwell Refresh Time	1 Minutes

Software Information


```
About CA15
SN          : CA-0000000
Software Ver  : 1.25
BootLoader Ver: 1.1


Please press 'EXIT' key to exit
```
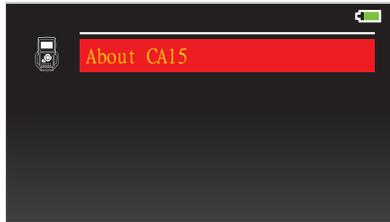
● Instruction of Scope

General Signal
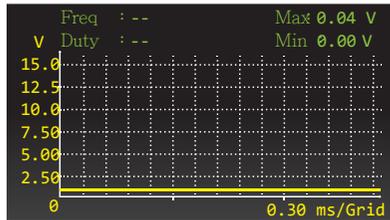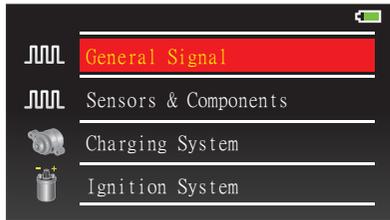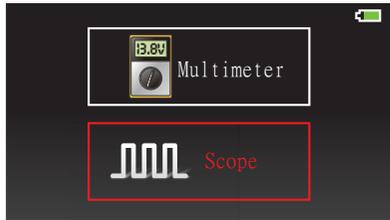
Press ▲▼ to modify the range of Voltage measurement
Press ◄► to modify the range of Time measurement
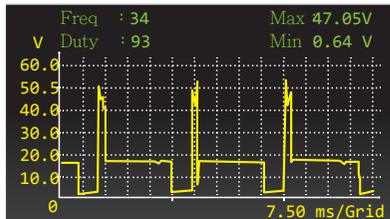
Connect postive (Red) and negative (Black) probe to measure.

Sensors & Components
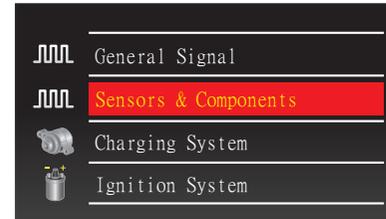
O2 Sensor
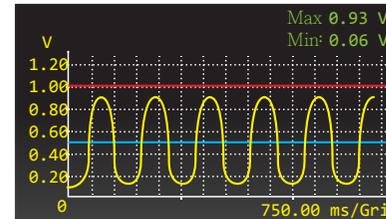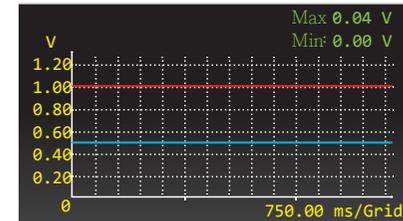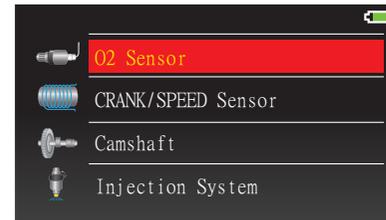
Enter O2 Sensor and connect positive probe (Red) with sensor and the negative probe (Black) with chassis ground of the vehicle in order to perform measurement.

CRANK/SPEED Sensor
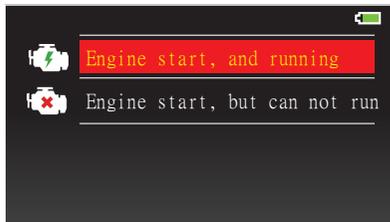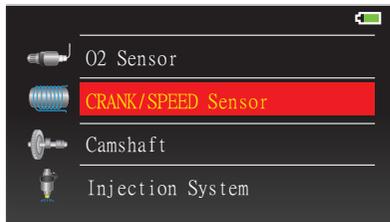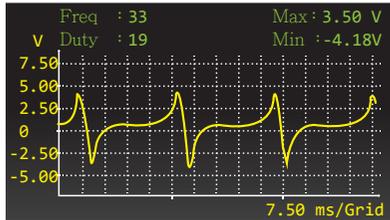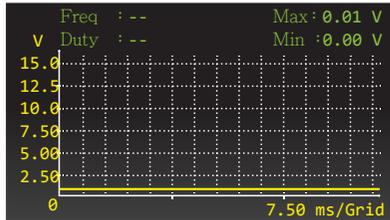
O2 Sensor
CRANK/SPEED Sensor
Camshaft
Injection System

Engine start, and running
Engine start, but can not run

Select Engine start, and running

| Freq : -- | Max : 0.01 V |
| Duty : -- | Min : 0.00 V |

V
15.0
12.5
10.0
7.50
5.00
2.50
0
7.50 ms/Grid

| Freq : 33 | Max : 3.50 V |
| Duty : 19 | Min : -4.18V |

V
7.50
5.00
2.50
0
-2.50
-5.00
7.50 ms/Grid

Enter CRANK/SPEED Sensor and connect positive probe (Red) with sensor and the negative probe (Black) with chassis ground of the vehicle in order to perform measurement.

Engine start, and running
Engine start, but can not run

| Freq : -- | Max : 0.00 V |
| | Min : 0.00 V |

V
6.00
5.00
4.00
3.00
2.00
1.00
0
30.00 ms/Grid

Select Engine start, but cannot run.

| Freq : 8 | Max : 1.35 V |
| | Min : -0.20V |

V
1.50
1.00
0.50
0
-0.50
-1.00
30.00 ms/Grid
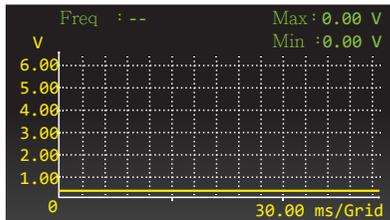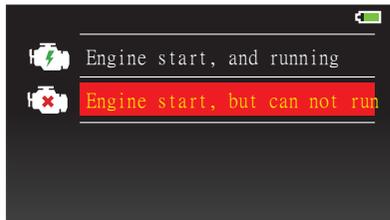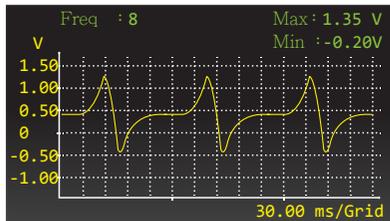
Enter CRANK/SPEED Sensor and connect positive probe (Red) with sensor and the negative probe (Black) with chassis ground of the vehicle in order to perform measurement.

Camshaft
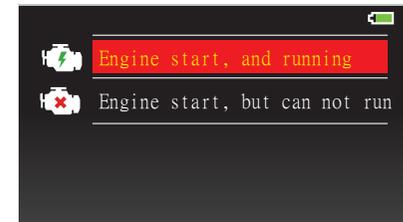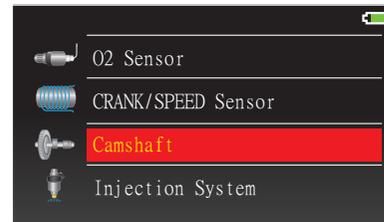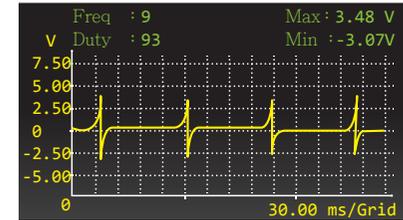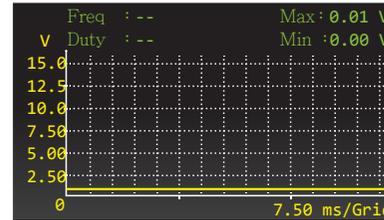
O2 Sensor
CRANK/SPEED Sensor
Camshaft
Injection System

Engine start, and running
Engine start, but can not run

Select Engine start, and running.

| Freq : -- | Max : 0.01 V |
| Duty : -- | Min : 0.00 V |

V
15.0
12.5
10.0
7.50
5.00
2.50
0
7.50 ms/Grid

| Freq : 9 | Max : 3.48 V |
| Duty : 93 | Min : -3.07V |

V
7.50
5.00
2.50
0
-2.50
-5.00
30.00 ms/Grid

Enter Camshaft and connect positive probe (Red) with sensor and the negative probe (Black) with chassis ground of the vehicle in order to perform measurement.

Engine start, and running
Engine start, but can not run

Square Waveform
Waveform
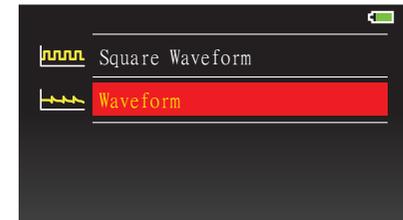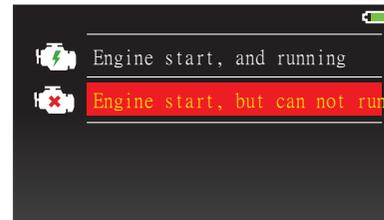
Please select Engine start, but cannot run and Square Waveform or Waveform
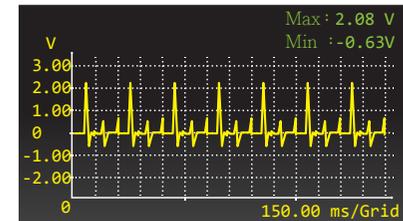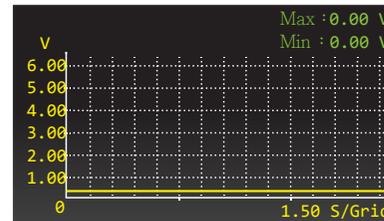
| | Max : 0.00 V |
| | Min : 0.00 V |

V
6.00
5.00
4.00
3.00
2.00
1.00
0
1.50 S/Grid

| | Max : 2.08 V |
| | Min : -0.63V |

V
3.00
2.00
1.00
0
-1.00
-2.00
150.00 ms/Grid

Enter Camshaft and connect positive probe (Red) with sensor and the negative probe (Black) with chassis ground of the vehicle in order to perform measurement.

Injection System
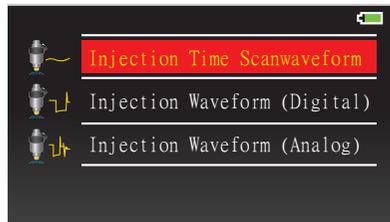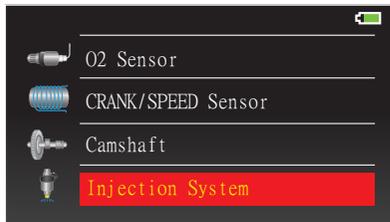
Please select Injection Waveform mode: Injection Time Scanwaveform, Injection Waveform (Digital), or Injection Waveform (Analog)
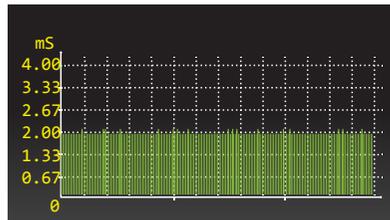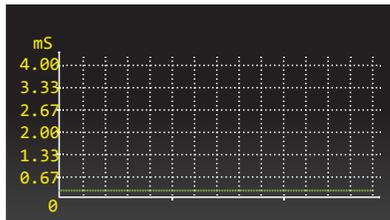
Enter Injection Time Scanwaveform and connect positive probe (Red) with sensor and the negative probe (Black) with chassis ground of the vehicle in order to perform measurement.

Injection Waveform (Digital)
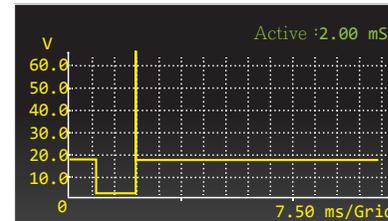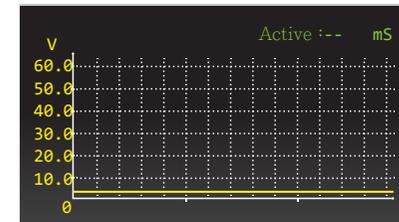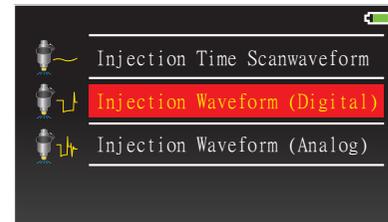
Enter Injection Waveform (Digital) and connect positive probe (Red) with sensor and the negative probe (Black) with chassis ground of the vehicle in order to perform measurement.

Injection Waveform (Analog)
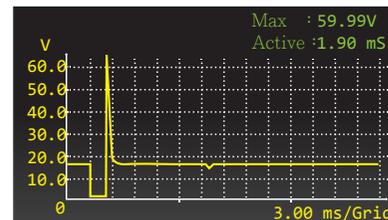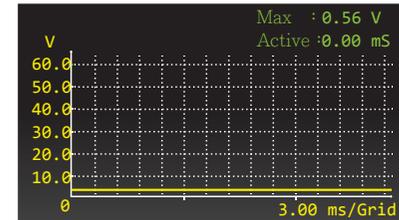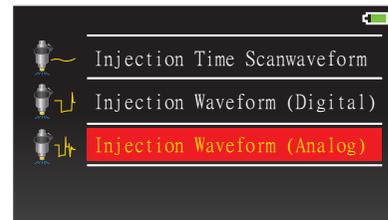
Enter Injection Waveform (Analog) and connect positive probe (Red) with sensor and the negative probe (Black) with chassis ground of the vehicle in order to perform measurement.

Throttle Position Sensor
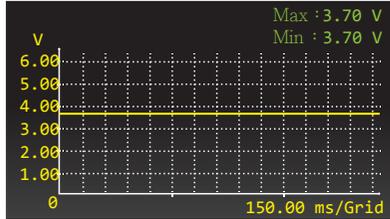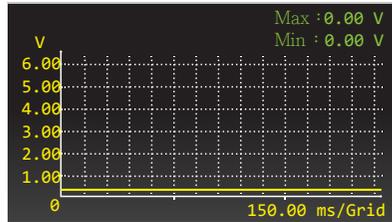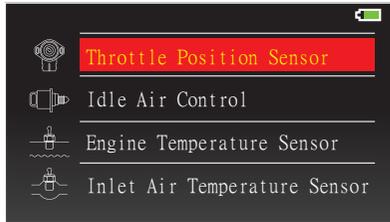
Enter Throttle Position Sensor and connect positive probe (Red) with sensor and the negative probe (Black) with chassis ground of the vehicle in order to perform measurement.

Idle Air Control
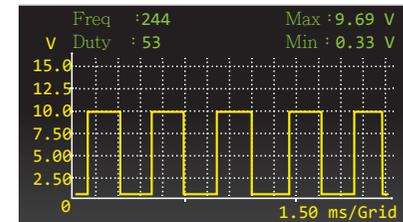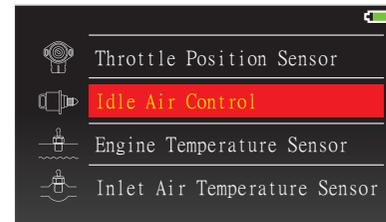
Enter Idle Air Control and connect positive probe (Red) with sensor and the negative probe (Black) with chassis ground of the vehicle in order to perform measurement.

Engine Temperature Sensor
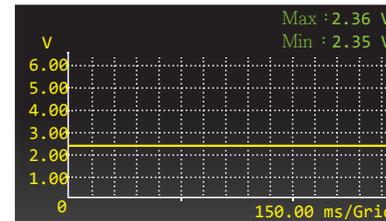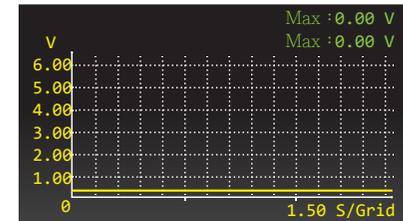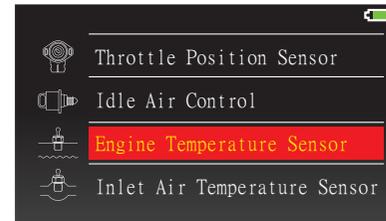
Enter Engine Temperature Sensor and connect positive probe (Red) with sensor and the negative probe (Black) with chassis ground of the vehicle in order to perform measurement.

Inlet Air Temperature Sensor

Throttle Position Sensor	Max : 0.00 V
Idle Air Control	Min : 0.00 V
Engine Temperature Sensor	V 6.00 5.00 4.00 3.00 2.00 1.00
Inlet Air Temperature Sensor	0 1.50 S/Grid

Max : 2.36 V
Min : 2.35 V
V 6.00 5.00 4.00 3.00 2.00 1.00
0 150.00 ms/Grid
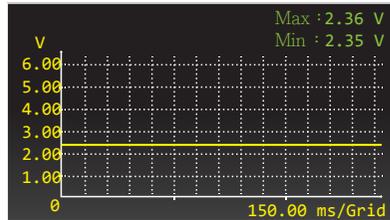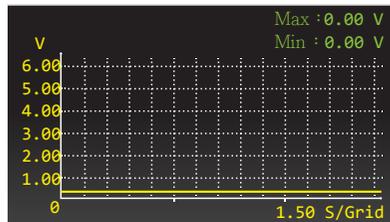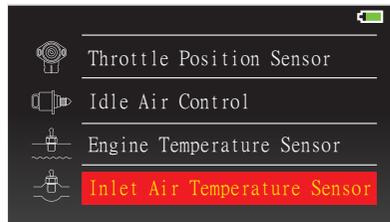
Enter Inlet Air Temperature Sensor and connect positive probe (Red) with sensor and the negative probe (Black) with chassis ground of the vehicle in order to perform measurement.

Ignition Trigger Signal

Ignition Trigger Signal	Freq : -- Max : 0.01 V
Air Flow Sensor	Duty : -- Min : 0.00 V
	V 6.00 5.00 4.00 3.00 2.00 1.00
	0 7.50 ms/Grid

Freq : 29   Max : 6.00 V
Duty : 21   Min : 0.73 V
V 6.00 5.00 4.00 3.00 2.00 1.00
0 7.50 ms/Grid
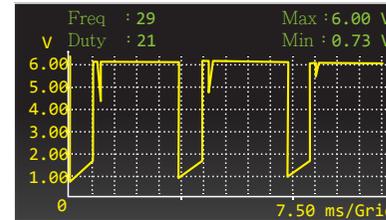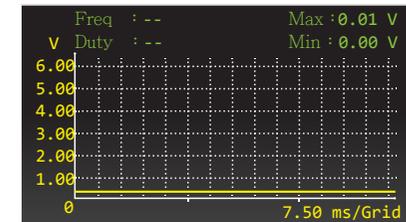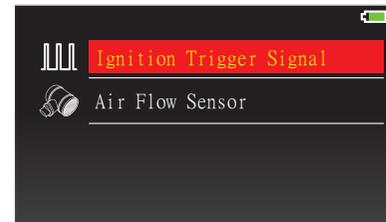
Enter Idle Ignition Trigger Signal and connect positive probe (Red) with sensor and the negative probe (Black) with chassis ground of the vehicle in order to perform measurement.

Air Flow Sensor
Voltage Scan Mode
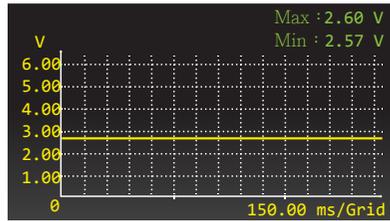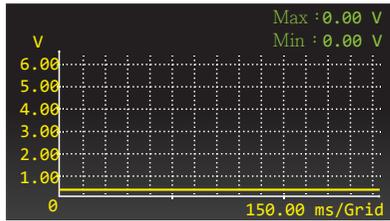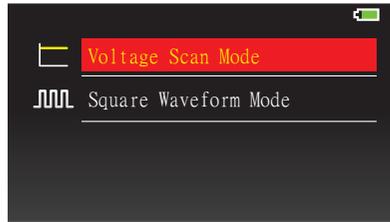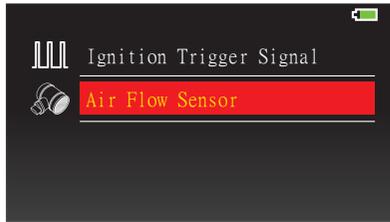
Enter Air Flow Sensor and connect positive probe (Red) with sensor and the negative probe (Black) with chassis ground of the vehicle in order to perform measurement.
Analog air flow sensor is same as Voltage air flow sensor. Such as: Toyata Surf, Toyata Vios.

Square Waveform Mode
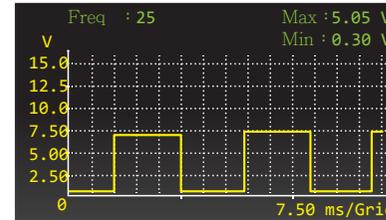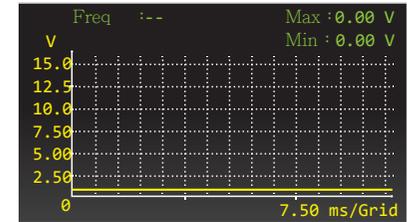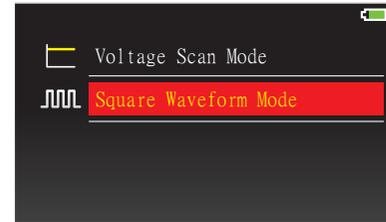
Digital air flow sensor is same as Frequency air flow sensor. Such as: Mitsubishi Galant.

Charging System
Enter Charging System to select Battery Voltage or Ripple Test.
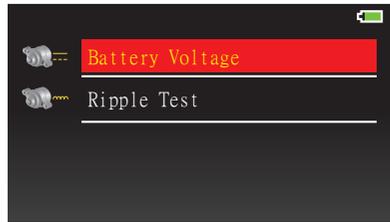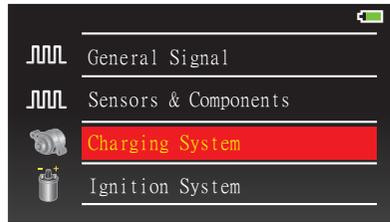
Battery Voltage
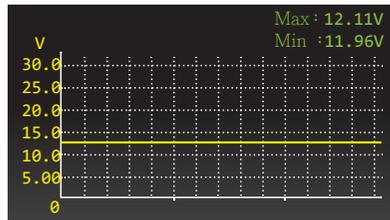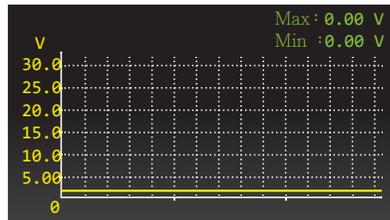
Enter Battery Voltage and connect positive probe (Red) with sensor and the negative probe (Black) with chassis ground of the vehicle in order to perform measurement.

Ripple Test
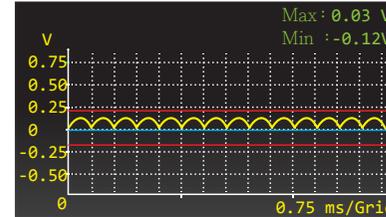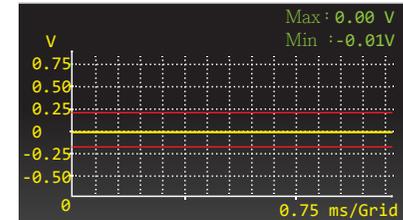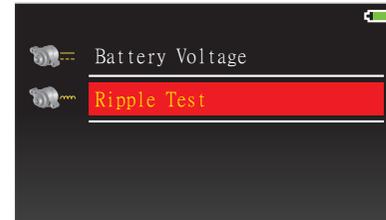
Enter Ripple Test and connect positive probe (Red) with sensor and the negative probe (Black) with chassis ground of the vehicle in order to perform measurement.

※ Attention: Ripple Test is only for measuring Ripple Test. Please DO NOT attempt to measure any other type of value under this setting.

Ignition System

Enter Ignition System to select Ignition Primary or Ignition Secondary
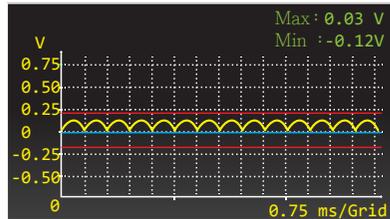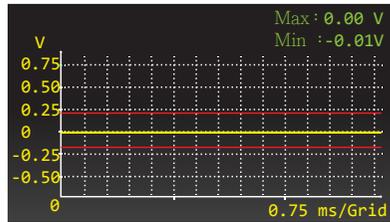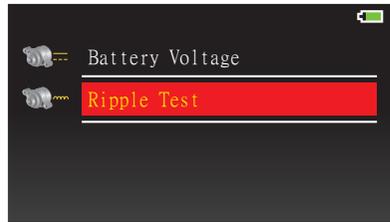
Ignition Primary

Enter Ignition Primary to select Dwell Scanwaveform or Ignition Coil Primary Waveform.
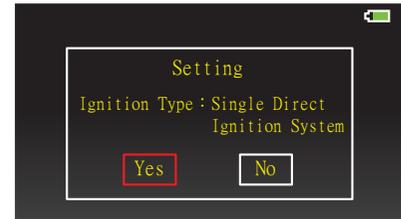
Confirm ignition type and number of cylinders.
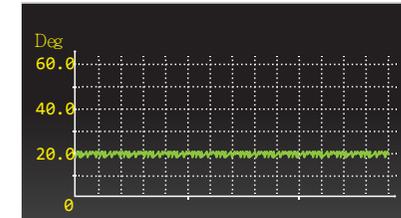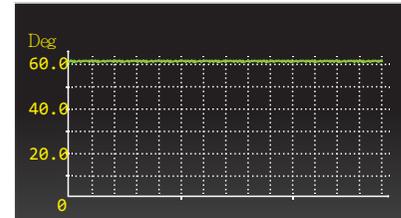
Enter Dwell Scanwaveform and connect positive probe (Red) with sensor and the negative probe (Black) with chassis ground of the vehicle in order to perform measurement.

Ignition Coil Primary


```
Max  : 1.17 V
Active: 0.00 mS
V
60.0
50.0
40.0
30.0
20.0
10.0
0          3.00 ms/Grid
```



```
Max  : 59.99V
Active :6.80 mS
V
60.0
50.0
40.0
30.0
20.0
10.0
0          3.00 ms/Grid
```
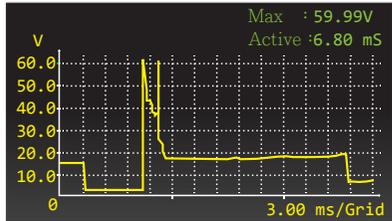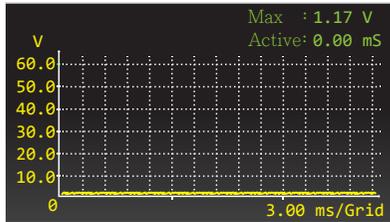
Enter Ignition Coil Primary and connect positive probe (Red) with sensor and the negative probe (Black) with chassis ground of the vehicle in order to perform measurement.
Max. Voltage is out of range, press ▲▼ to modify the range of Voltage measurement.

Ignition Secondary


```
Ignition Primary
Ignition Secondary
```



```
Please connect IG-M1

Please press 'ENTER' key to Start
```
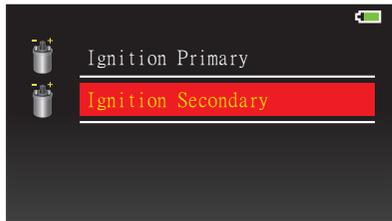
Please connect IG-M1 for measuring Ignition Secondary.

Additional function of waveform


```
Max  : 363.5V
Active: 31.25mS
V
600
500
400
300
200
100
0          7.50 ms/Grid
```
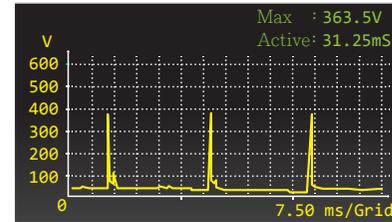
When measuring waveform, press ENTER for freeze-frame current waveform.


```
Max  : 363.5V
Active: 31.25mS
V
600
500
400
300
200
100
0          7.50 ms/Grid
```
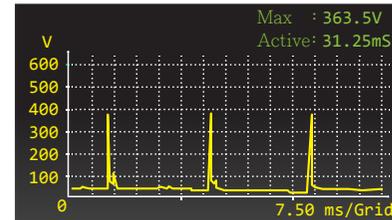
Press number 1,2,3 to modify the range of Time measurement (Y-axis).


```
Cuso1 - Cuso2: 31.50 ms
V
600
500
400
300
200
100
0          7.50 ms/Grid
```
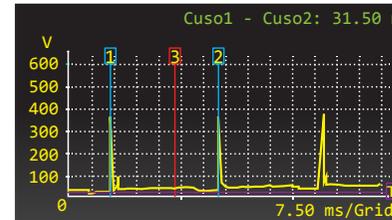
After setup, check Time from this waveform to next waveform.

Setup

Enter Setup to view and modify current settings.

```
                    Setting
1.Ignition Type        : Single Direct
                         Ignition System
2.Trigger Type         : Falling Edge
3.Sleep Mode           : 5 Minutes
4.Voltage Measure Type : Maximum Voltage


    press 'ENTER' key to change setting
```

Ignition Type Setting

```
Ignition Type Setting        Distributor
Waveform Trigger
Sleep Mode Setting           Single Direct Ignition System
Voltage Measure Type         Dial Direct Ignition System
```

Select Ignition type: Single Direct Ignition System

```
Ignition Type Setting
Waveform Trigger             The setting is just for General
Sleep Mode Setting           Signal function
Voltage Measure Type

                             Please press 'ENTER' key to Start
```

```
Rising Edge
Falling Edge
```

Select Waveform Trigger: Rising Edge or Falling Edge

Sleep Mode Setting

```
Ignition Type Setting        off
Waveform Trigger             5 Minutes
Sleep Mode Setting           10 Minutes
Voltage Measure Type         15 Minutes
```

Select time for Sleep Mode

```
Ignition Type Setting        Maximum Voltage
Waveform Trigger             P-P
Sleep Mode Setting
Voltage Measure Type
```
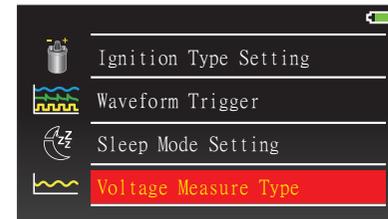
Select Voltage Measure Type: Maximum Voltage or P-P (Peak to Peak)

Software Information

```
About CA15                        About CA15
                             SN            : CA-00000007
                             Software Ver    1.25
                             BootLoader Ver  1.1


                             Please press 'EXIT' key to exit
```
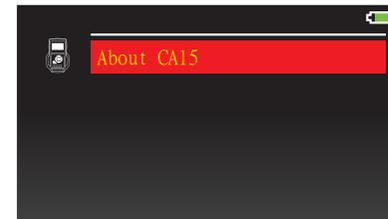
CA-15 Software update

Step 1: Download and Install driver

(1) Please login to our member and download driver from website www.autolandscientech.com
PSM3_driver_v4.inf (iSCAN-II / VeDiS-II / PSM3 USB Driver)
(You must have registered to become our member to be able to access the member area)

NOTE
The driver is same as driver for iScan-IIwt / VeDiS-II. If you have already downloaded this software please disregard and skip to step 2.

(2) Please right click to install driver.
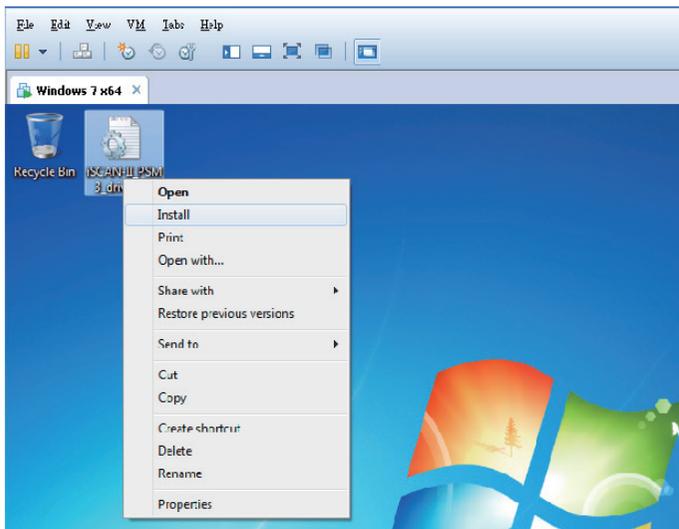
(3) Please select "Install this driver software anyway".
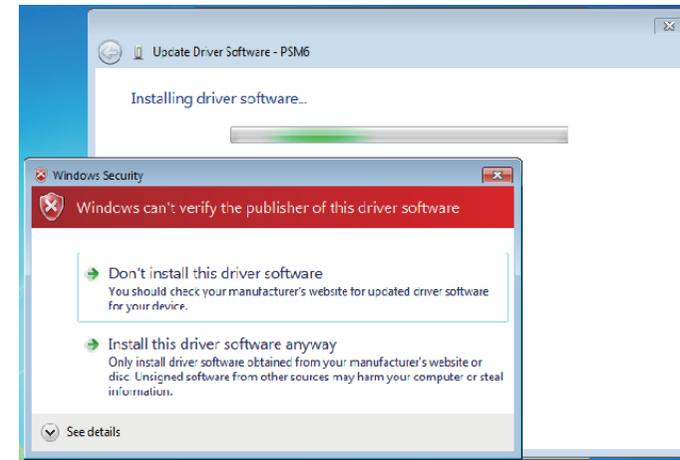
Step 2: Update CA15 Software

(1) Please use USB cable (PS-C) to connect CA15 base unit to PC/NB, and power on CA15 (please make sure the battery has been inserted into CA15 base unit). The power indicator of CA15 base unit will be light on, but screen display will not be light on.

(2) Please download latest CA15 software by clicking Update
www.autolandscientech.com

(3) Please open CA15 software and update.
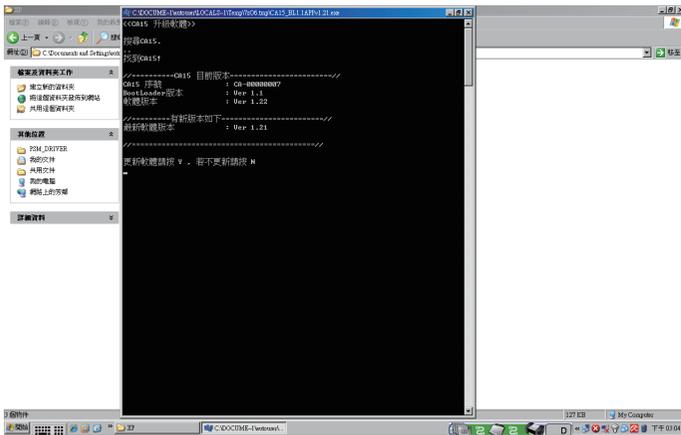
(4) After installation, CA15 will reboot .
Close software and remove USB cable.
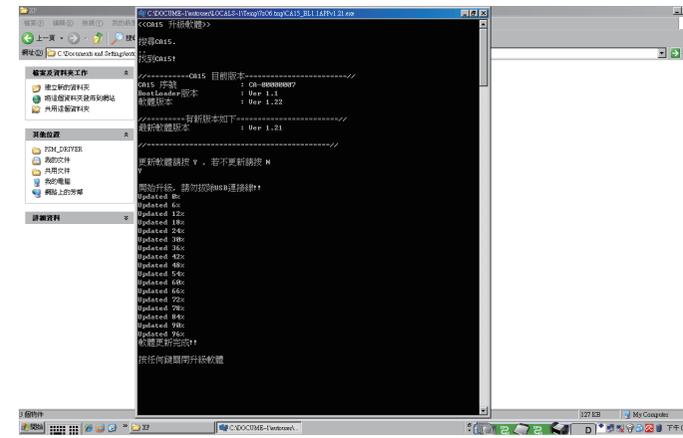
(5) How to check if PC/NB connects to CA15 properly?
    Please right click " Computer" and select "Properties".
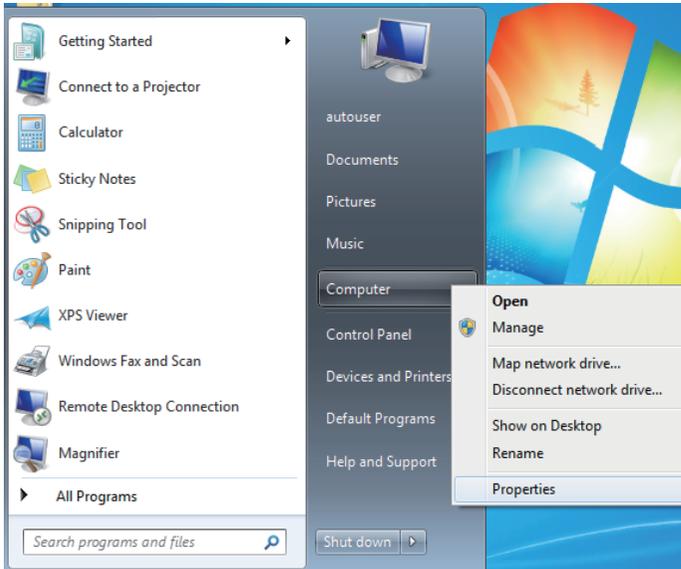
Select "Device Manager"
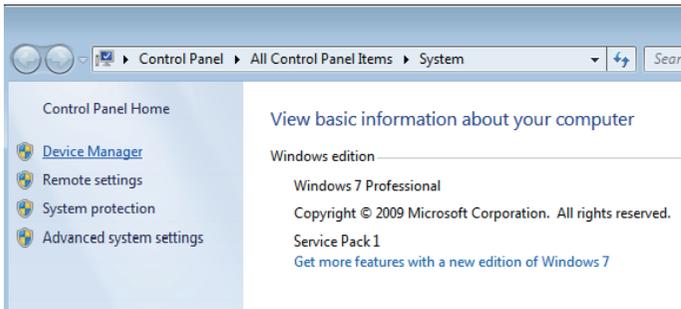
If successfully installed "Autoland PSModule (COM3)" will be listed under Device Manager.