PROGRAMMABLE LoggerSCOPE

(Universal Scope, Data Logger & DMM)

User's Manual

Ref # S2xxx-200707-R00

Programmable

Data Logger Scope

Table of Contents

1. GENERAL INFORMATION 1-1

1.1. FEATURE OVERVIEW 1-1

1.1.1. Universal SCOPE Mode 1-1

1.1.2. DATA Logger 1-2

1.1.3. Digital Multi-Meter 1-2

1.1.4. Frequency Counter 1-2

1.1.5. General 1-2

1.2. WARRANTY INFORMATION 1-3

1.3. PRECAUTION OF OPERATION 1-3

1.4. UPKEEP OF THE EQUIPMENT 1-4

1.5. SAFETY INFORMATION: READ FIRST 1-4

1.6. SYMBOLS AND TERMS 1-5

1.7. UNPACKING THE TEST TOOL KIT 1-6

1.7.1. Standard 1-6

1.7.2. Options 1-6

2. PRODUCT DESCRIPTION 2-1

2.1. THE INPUT TERMINAL AREA 2-1

2.1.1. Caution ( ) 2-2

2.1.2. Warning ( ) 2-2

2.1.3. 600V MAX 2-2

2.1.4. The METER provides 4 input jacks. 2-2

2.2. THE KEYS AREA 2-3

2.2.1. Turning on and off ( ) 2-3

2.2.2. AUTO key ( ) 2-3

2.2.3. TRIGger key ( ) 2-3

2.2.4. Function key ( ) 2-3

2.2.5. Command menu keys ( ) 2-4

2.2.6. Four arrow keys ( ) 2-4

2.2.7. Display back light ( ) 2-6

2.2.8. Hold key ( ) 2-6

2.3. THE DISPLAY AREA 2-6

2.3.1. Special indicator 2-6

2.3.2. DISPLAY depends on the function 2-7

2.3.3. The Command Menu 2-14

Table of Contents

2.4. THE USB INTERFACE AND POWER INPUT TERMINAL 2-15

2.4.1. USB INTERFACE 2-15

2.4.2. Power Adaptor Input Terminal 2-15

3. USING THE SCOPE 3-1

3.1. POWERING THE METER 3-1

3.2. CHANGING BACKLIGHT 3-1

3.3. SELECTING "GENERAL SCOPE" IN A MENU 3-1

3.4. SELECTING ITEMS IN SCOPE SETUP MENU 3-2

3.4.1. Set Frequency measurement for CHA 3-2

3.5. CHANGING THE GRAPHIC REPRESENTATION 3-3

3.5.1. Changing the vertical division 3-3

3.5.2. Changing the Horizontal division (Time Base) 3-3

3.5.3. Positioning the Waveform of CH A on the Screen 3-4

3.5.4. Positioning the Waveform of CH B on the Screen 3-4

3.5.5. Positioning the Trigger Point Indicator on the Screen 3-4

3.6. ACQUIRING THE WAVEFORM 3-5

3.6.1. Recording slow signals over a Long Period of Time. 3-5

3.6.2. Selecting AC-Coupling for INPUT A 3-5

3.7. TRIGGERING ON A WAVEFORM 3-6

3.7.1. Setting Trigger mode (Tmode) 3-6

3.7.2. Setting AUTO Trigger Level 3-7

3.7.3. Setting Normal Trigger mode 3-7

3.7.4. Setting Trigger Slope 3-8

3.7.5. Changing the Trigger level Indicator 3-8

3.7.6. Making a single acquisition 3-9

3.8. STORING AND RECALLING SCREENS 3-9

3.8.1. Storing Screen 3-9

3.8.2. Recalling Screen 3-10

4. USING THE DATA LOGGER 4-1

4.1. SELECTING ITEMS IN DATA LOGGER SETUP MENU 4-1

4.1.1. Change the Sampling Type 4-2

4.1.2. Change the Sampling interval Time 4-2

4.1.3. Change the Start/Stop Address 4-2

4.2. START DATA LOGGER PROCEDURE 4-3

4.2.1. Changing the Measurement Function & Range 4-4

4.3. RECALL DATA 4-4

5. USING THE DIGITAL MULTIMETER 5-1

5.1. THE DISPLAY OF DIGITAL MULTIMETER MODE 5-1

5.1.1. RECORD MODE 5-1
5.1.2. RELATIVE MODE 5-1
5.1.3. COMPARE MODE 5-2
5.1.4. TREND PLOT 5-2
5.2. MEASUREMENT PROCEDURES 5-3
5.2.1. DC V 5-3
5.2.2. AC V 5-4
5.2.3. Resistance 5-5
5.2.4. Continuity 5-5
5.2.5. Frequency 5-6
5.2.6. RPM 5-6
5.2.7. Pulse Width 5-7
5.2.8. Duty 5-7
6. SYSTEM SETUP 6-1
6.1. CHANGE THE BEEPER OF SYSTEM. 6-1
6.2. AUTO POWER OFF 6-1
6.3. SET THE BAUD RATE (BPS) OF USB 6-1
6.4. CHANGE THE CURRENT DATE AND THE TIME 6-2
6.4.1. The Current Time set procedure 6-2
6.4.2. The Current Date set procedure 6-2
7. SPECIFICATIONS 7-1
7.1. GENERAL SPECIFICATIONS 7-1
7.2. TECHNICAL SPECIFICATION 7-2
7.2.1. The General Oscilloscope Function 7-2
7.2.2. The Data Logger Function 7-3
7.2.3. The Digital Multimeter Function 7-3
8. REMOTE INTERFACE OPERATIONS 8-1
8.1. USB HID DEVICE INSTALLATION 8-1
8.1.1. System Requirements 8-1
8.1.2. Operating System 8-1
8.2. VERIFYING THE COMPUTER'S USB PORT 8-1
8.2.1. Installing the HID Device 8-1
8.3. TO INSTALL WINDOWS APPLICATION SOFTWARE 8-3
8.4. RUNNING THE APPLICATION SOFTWARE 8-4
8.4.1. Oscilloscope Mode 8-4
8.4.2. DMM & Data Logger Mode 8-5
8.4.3. Display Mode for DMM & Data Logger Mode 8-6

Table of Contents

9. MAINTAINING THE METER 9-1

9.1. ABOUT THIS CHAPTER 9-1
9.2. STATIC SAFE HANDLING 9-1
9.3. CLEANING THE METER 9-1
9.4. STORING THE METER 9-2
9.5. CALIBRATION 9-2
9.6. REPLACING AND DISPOSING OF THE LI-ION BATTERY 9-2
9.6.1. To replace the battery pack 9-3

10. APPENDICES 10-1

10.1. TROUBLESHOOTING GUIDE 10-1
10.2. LCD STATUS BY FUNCTIONS 10-2
10.2.1. Function Menu & General Scope Mode 10-2
10.2.2. Data Logger Mode 10-2
10.2.3. Multimeter / Record Mode 10-2
10.2.4. Multimeter / Relative Mode 10-3
10.2.5. Multimeter / Compare Mode 10-3
10.2.6. Multimeter / Trend Plot Mode 10-3
10.2.7. System Setup Mode 10-4
10.2.8. Trigger Setup Mode 10-4

1. General Information

This section contains general information about the METER. The information is shown below:

- Feature Overview
- Warranty Information
- Safety Information
- Symbols and Terms
- Specifications
- Unpacking the Test Tool Kit

If you have any questions after reading this information, please contact your local service representative.

1.1. Feature Overview

This equipment is a handheld, battery-operated Oscilloscope, True RMS Data Logger and/or Digital Multimeter designed and tested according to IEC Publication 1010-1 (EN 61010-1:1993, Over voltage Category II) ….
This equipment offers enhanced features that similar type test instruments on the market today don't have. All the functions are designed to be very convenient to use. You can quickly get used to working with this equipment and the great many functions integrated inside.
This instrument features:

1.1.1. Universal SCOPE Mode

- Dual Channel and Auto Calibration.
- Sampling Time
  Single CH mode: 50 MS/s, Dual CH mode: 25 MS/s
- DC to 5MHz Oscilloscope band width
- 16 shot waveform and setup memories
- Automatic Triggering.
- Automatic setting for horizontal and vertical division
- Roll and Single shot mode
- Excellent internal noise reduction
- Real time Update.

1.1.2. DATA Logger

- Data Logger Memory: 17,000 Points, Optional: 35,000 Points
- Data loggers for the following types of signals: DCV, ACV, OHM, BZ, Hz, RPM, P/width, Duty
- Print interval programmable in Hours Minutes seconds
- Append incoming data to already existing data
- Sampling Rate: 0.25S/s
- Sample interval from 1 second to 9,999 seconds.
- Sampling Mode: Peak, Sampling Time
- Built-in Real Time Clock (RTC)
- Start / stop address setting.
- Data retained when battery is low or has been removed.

1.1.3. Digital Multi-Meter

- Large 10,000 count and fast 101 segment analog Bar Graph display
- Programmable Function mode: Multi display measurements
  Record (Max, Min, Avg), Relative (Ref, Err), Compare (GO-NOGO) mode and Trend plot
- Real Time for MAX or MIN, elapsed time for AVG.
- Meter automatically selects best range instantly (Fast Auto range)
- Data hold and run mode
- RPM, Duty cycle and Pulse width measurement
- True RMS digital Multi-meter
- Max. Voltage between Input and Ground: DC or AC 600Vrms
- 600V Overload Protection

1.1.4. Frequency Counter

- Frequency Range: 0 to 10MHz
- Accuracy: ±(0.05%+5)

1.1.5. General

- Easy to Operate
- Backlit display with Low battery indication.
- USB PC interface for viewing, saving measurement and waveform data.
- Auto power off and "keep on" mode
- Display Type: Super-Twist 132 x 128 pixels
- Designed to comply with safety standards: UL3111 and CSA C22.2 No.1010-1

1.2. Warranty Information

1. Warranty: Our Company guarantees that this product meets its published specifications at the time of shipment from the factory. Under proper installation it should work as expected.
2. Warranty Period: This equipment is warranted against defects in material and manufacturing for a period of one year (rechargeable battery: 6 months) from the date of shipment. During the warranty period, Our Company is responsible for necessary repairs as long as the product can be proved to be defective. For warranty service or repair this product must be returned to a service facility designated by Our Company. Please contact your local service representative.
3. Excluded Items: This warranty does not include consumptive parts such as fuses, keys and relays. Neither does this warranty cover defects caused by improper installation, improper or insufficient maintenance, unauthorized modification, improper operation, ignorance of environmental specifications or improper software or interfacing.
4. Remarks:

- No other warranty is expressed or implied, except for the above mentioned.
- The remedies provided herein are the buyer's sole and exclusive remedies. Our Company shall not be liable for any direct, indirect, special, incidental or consequential damages.

Limitation of warranty

1. Our warranties do not cover any damage resulting from unauthorized modification or misuse.
2. Unless mentioned elsewhere in this document, our warranty does not apply to fuses, probes, and problems arising from normal wear or user's failure to follow instructions.
3. Our warranties do not apply on any direct, incidental, special, or consequential damages.
4. The above warranties are exclusive and no other warranty is expressed or implied. Our Company disclaims any implied warranties of MERCHANTABILITY, SATISFACTORY QUALITY, and FITNESS for any particular reasons.

1.3. Precaution of Operation

- Please carefully read the manual before operating this device.
- This manual is for reference only. Please consult your local service representative for further assistance.
- The contents of this manual may be amended by the manufacturer without notice.
- Never dismantle the equipment by any unauthorized personnel, or equipment may be damaged.
- The equipment has been strictly tested for quality before delivery from our factory.

However, this equipment must not be used in dangerous situations where damage may result.

- This product should be placed in a safe area in case of unpredictable personnel use.
- The rear protective conduct terminal needs to be connected to the actual earth ground or electric shock may occur.
- The patent and related documents for the equipment belong to Our Company and they aren't allowed to be used by others without permission.

1.4. Upkeep of the equipment

- Although the equipment is very durable and weather resistant, care should be taken not to expose it to severe impact or pressure.
- Keep the equipment far from water and damp environment.
- Calibration will be taken every year. Please contact with your local service representative for more information.
- If the incorrect display or abnormal beeps occurred, you should stop using the equipment at once.
- Do not use the Meter around explosive gas or inflammable vapor.
- Wipe the surface of the equipment with a piece of dry and clean cloth.

1.5. Safety Information: Read First

⚠ **Warning!**

Please read through the following safety information before using the product.

To avoid possible electric shock or personal injury, please read and follow these guidelines carefully:

- Follow the guidelines in this manual and DO NOT use the Meter if the case is damaged. Check the Meter case and terminals, and make sure all the devices are in the proper positions.
- Do not apply excessive voltage to the Multimeter. Apply voltage within the rated range only.
- Use caution when measuring voltages above 30V RMS, 42V peak, or 60V DC. These voltages pose an electric shock hazard.
- When using the probes, always keep your fingers behind the finger guards.
- Always connect the common test leads (black) before connecting the live test leads (red), and disconnect the live test leads (red) before disconnecting the common test leads (black). This will reduce the chance of an electric shock.
- Disconnect circuit power and discharge all high-voltage capacitors before testing resistance, continuity.
- If you need to open the Meter case or replace any parts, read the instruction in this

manual first. You must be the qualified personnel to perform this action.

- When replacing fuses, use only the same type and same rating as specified.
- Do not try to operate the Meter if it is damaged. Disconnect the power from the equipment and consult the local service representative. Return the product to our company service department if necessary.

1.6. Symbols and Terms

See explanation in manual before using this Meter. This symbol indicates hazards that may cause damages to the instrument or even result in personal injury.

This symbol indicates high voltage may be present. Use extra caution before taking any action.

Double Insulation (Protection Class II)

Recycling information

Equal potential inputs

High BNC Input

This symbol indicates earth (ground) terminal.

Either AC or DC

 DC – Direct Current

AC – Alternating Current

This symbol indicates Fuse.

This symbol indicates this product complies with the essential requirements or the applicable European laws or directives with respect to safety, health, environment and consumer protections.

1.7. Unpacking the Test Tool Kit

Your product package is supplied with the following items:

1.7.1. Standard

- One LoggerScope
- Two Test leads
- One Li-ION Battery (installed)
- One AC Power & Rechargeable Adaptor
- One CD (including this electronic User's Manual and Etc)
- One Carrying case

1.7.2. Options

- Rubber Holster
- USB cable (4P-USB)
- Demo Software for Windows

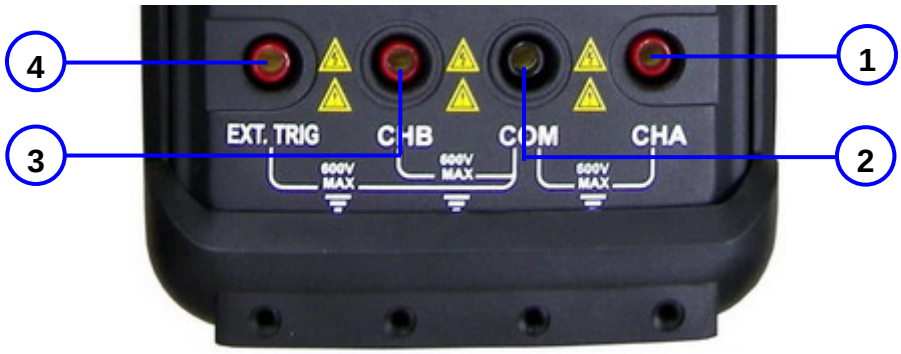
Note:
The accessories may be changed to improve the product quality without notifying the customers. Optional accessories will be made available at a later date.

2. Product Description

For users to become familiar with the METER, we will give a brief introduction to the basic operations of the METER. There are four major parts of the METER. We will discuss each of them in the following sections.

1. The input Terminal area
2. The Keys area
3. The Display area
4. The USB Interface and Power input terminal

2.1. The input Terminal area



2. Product Description

2.1.1. Caution (⚠)

Refer to the user's manual before using this Meter.

2.1.2. Warning (⚠)

Be extremely careful when making high-voltage measurements; DO NOT TOUCH TERMINALS OR ENDS OF TEST LEAD PROBES.

2.1.3. 600V MAX ⏚

To avoid electrical shock or instrument damage, do not connect the COM input terminal to any source of more 600V with respect to earth/ground.

2.1.4. The METER provides 4 input jacks.

1) Channel A

You can always use the red Channel A for all single input measurements possible with the meter.

2) Common

You can use the black common as single ground for low frequency measurements and for ACV, DCV, Ohm, Continuity, Hz, RPM, P/W and DTY measurements.

3) Channel B

For measurements on two different signals you can use the Channel B together with the Channel A.

4) External trigger

The EXT.TRIG input accepts external trigger signals.

2.2. The Keys area

2.2.1. Turning on and off (I / O)

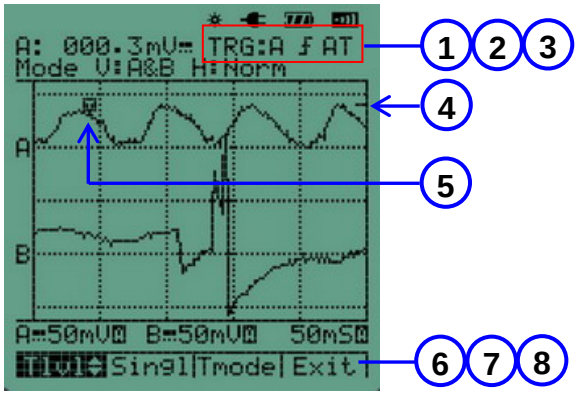
Pressing this key for 1 to 2 seconds will turn the unit on.
Pressing this key again will turn the power off.

2.2.2. AUTO key (AUTO)

1) In case of the General Scope Mode, Pressing this key will change Vertical and Horizontal division from Manual to Auto-setting (H).
2) In case of the Data Logger and Digital Multimeter, Pressing this key will change the Range to Auto-range (AT).

2.2.3. TRIGger key (TRIG)

Triggering tells the Meter when to begin displaying a waveform.
This key can use General Scope Mode only.



① Trigger Source: Channel A or B
② Slope: Rising or Falling
③ Trigger setting mode (Auto or Normal)
④ Trigger Level indicator
⑤ Trigger point indicator
⑥ Command Menu: Trigger level
⑦ Command Menu: Single shot
⑧ Command Menu: Trigger mode (Setup)

2.2.4. Function key (FUNC)

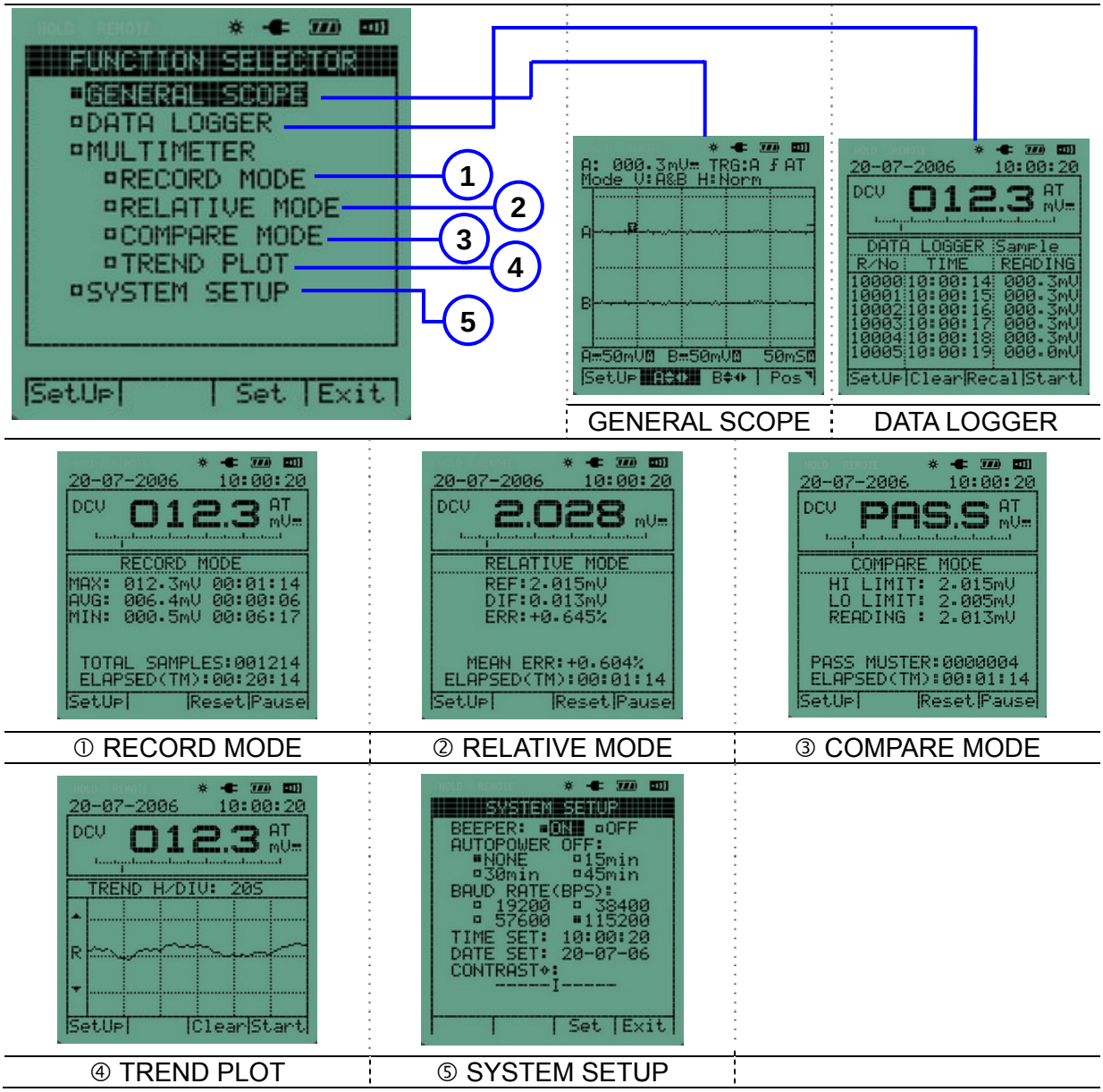
Press FUNC key to display the default menu and submenus as shown below.

2. Product Description

① : Use the arrow keys to highlight the item.

② [F3]: Select the item

③ If you enter the Setup mode for each Function, press [F1] key.



① RECORD MODE | ② RELATIVE MODE | ③ COMPARE MODE

④ TREND PLOT | ⑤ SYSTEM SETUP

2.2.5. Command menu keys ([F1] [F2] [F3] [F4])

F1 through F4 are command menu keys. These keys have a corresponding menu item displayed on the LCD. Pressing the F key selects the desired item.

2.2.6. Four arrow keys ( )

These keys serve as the primary means of navigating the instrument's menus and operating displays.

1) In case of the General Scope Mode

Or	(1) When command menu is the Div mode. (SetUp A⇕ B⇕ | Div) → Vertical (Volt) Division changes. • : Press to change the higher division. [Ex-1] 50m→0.1→0.2→0.5→1→2→…→50→100→200V • : Press to change the lower division. [Ex-2] 200→100→50→…→2→1→0.5→0.2→0.1→50mV (2) When command menu is the Pos mode. (SetUp A⇕ B⇕ | Pos) → Waveforms of Channel A or B moves. • : Press to move the waveforms upward. • : Press to move the waveforms downward.
Or	(1) When command menu is the Div mode. (SetUp A⇕ B⇕ | Div) → Horizontal (Time) Division changes. • : Press to change the higher second. [Ex-1] 1uS→2uS→5uS→10uS→…→1S→2S→5S • : Press to change the lower second. [Ex-2] 5S→2S→1S→…→10uS→5uS→2uS→1uS (2) When command menu is the Pos mode. (SetUp A⇕ B⇕ | Pos) → Trigger point indicator ( ) moves. • : Press to move the Trigger point indicator leftward. • : Press to move the Trigger point indicator rightward.

2) In case of the Data Logger and Multimeter Mode

Or	Measurement Range change. • Press key to change the higher range. [Ex-1] 000.1mV→0.001V→00.01V→000.1V • Press key to change the lower range. [Ex-2] 000.1V→00.01V→0.001V→000.1mV
Or	Measurement Function change. • Press key to change the Measurement Function: [Ex-3] DTY→P/W→RPM→FRQ→BZ→OHM→ACV→ DCV • Press key to change the Measurement Function. [Ex-4] DCV→ACV→OHM→BZ→FRQ→RPM→P/W→DTY

3) In case of the System Setup mode

, , , : Press to move the cursor. This key also increases or decreases the value of a selection.

2.2.7. Display back light ( )

Press this key to turn on the backlight.

To turn the back light off, press this key again.

2.2.8. Hold key ( )

1) In case of the General Scope Mode

The meter can store setups and waveforms to memory for later recall. Sixteen (0-15) setup and waveform memories are available.

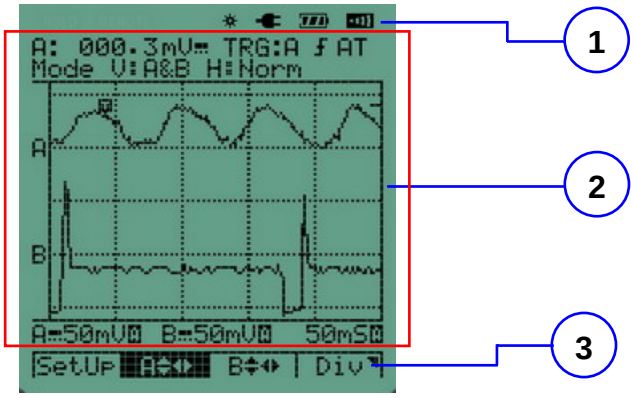
Displayed the Memory mode. (Store Recal Exit)

2) In case of the Data Logger and Multimeter Mode

You can freeze the screen (all readings and waveforms) at any time.

2.3. The Display area

The screen is divided into three areas: INDICATOR, DISPLAY depends on the function and command MENU. Refer to the Figure below.



2.3.1. Special indicator

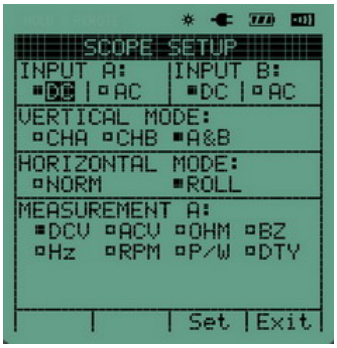
- HOLD: Freezes display in the LCD
- REMOTE: Indicates the remote state. (USB Interface)
- BACK LIGHT ( ): Back light indicator
- Charging LINE ( ): Charging Battery indicator
- BATTERY ( ): Low battery indicator
- BUZZER ( ): Buzzer indicator

2.3.2. DISPLAY depends on the function

1) The Display of Function Menu mode

Set General Scope, Data Logger, Multimeter and System Setup of the METER.

① Press FUNC to open Function Menu

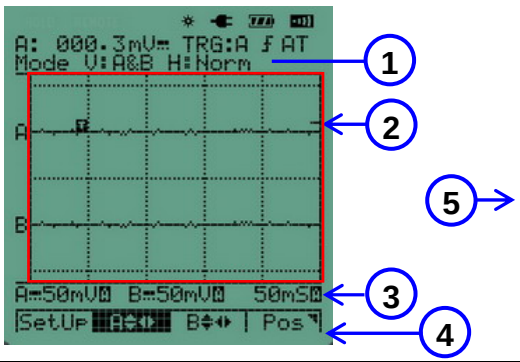


② Press F1 to open Setup

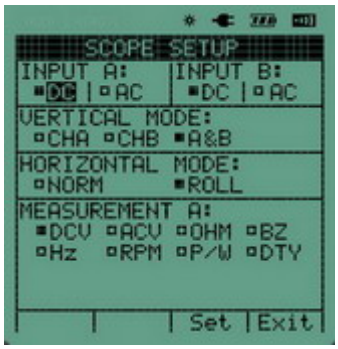
PATH: FUNC

2) The Display of General Scope mode

The screen is divided into four areas: a set point area, Live Scope display area, division setting area and command menu area. Refer to Figure below.



① FUNC →GENERAL SCOPE→ F3



② Press F1 to open Setup

PATH: FUNC →⇕→Selects “GENERAL SCOPE”→ F3

(2-1) The set value will be shown on this area automatically.

①-1. A: 000.3mV⎓ : Displays the numerical readings. Because only input A is on, you will see the input A readings only.

①-2. TRG:A : Trigger selection: Channel A, B and External

①-3. ƒ : Rising or falling edge

①-4. AT : Trigger mode: Normal or AUTO

①-5. Mode : Channel mode status

→ V:A&B: Vertical mode: CHA, CHB or A&B

→ H:Norm: Horizontal mode: Normal, Roll

①-6. M:00: When pressing H key in Scope mode only, The Memory Address appears at the top-right corner of the display area.

2. Product Description

(2-2) Live Scope display area

②-1 ▬▬ : Trigger level indicator

②-2 : Trigger point indicator

②-3 Live Scope Display (Channel A): Displays real time waveforms and freezes held captures.

②-4 Live Scope Display (Channel B)

(2-3) The Division value will be shown on this area.

③-1 A=50mV : Vertical Division of Channel A

③-2 B=50mV : Vertical Division of Channel B

③-3 50mS : Horizontal Divisions (Time base)

Pressing AUTO key changes Vertical division or horizontal division from MANUAL to AUTO (A).

(2-4) Command Menu Field

④-1 Default command Menu: SetUp A B Div

If press F4 key, the command menu changed to SetUp A B Pos

Toggles command Menu Div and Pos by F4 key.

④-2 Press TRIG key to display the TRIGGER command menu.

Trig Sing1 Tmode Exit

(2-5) The Setup mode for Scope.

⑤-1 INPUT A: AC/DC Coupling for Channel A.

⑤-2 INPUT B: AC/DC Coupling for Channel B.

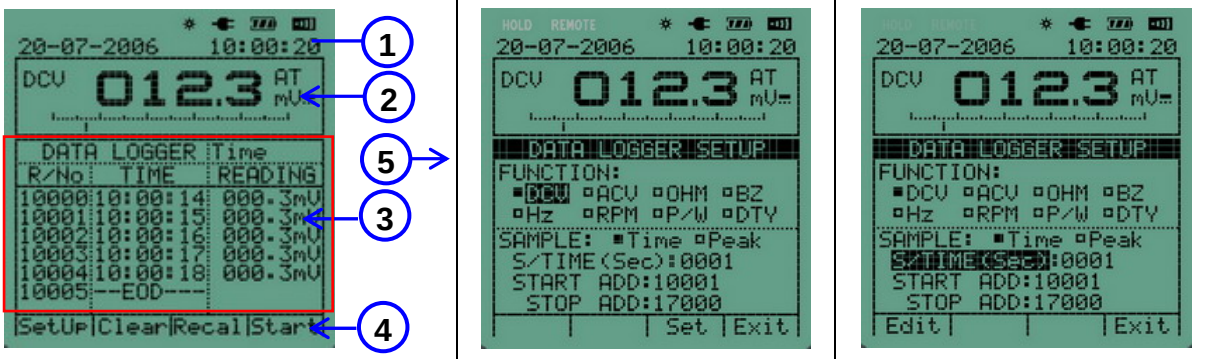
⑤-3 VERTICAL MODE: Set the CHA, CHB or CHA & CHB for Vertical mode.

⑤-4 HORIZONTAL MODE: Set the NORMal or ROLL for Horizontal mode.

ROLL MODE operates when the horizontal division is between 1s and 5s.

⑤-5 MEASUREMENT A: Set the Function of Measurement for Channel A.

3) The Display of Data Logger mode



① FUNC → DATA LOGGER → F3 ② Press F1 to open Setup ③ Press ▲▼ to change Edit mode

PATH: FUNC → ▲▼ → Selects "DATA LOGGER" → F3

(3-1) Display the Date and Time. (Data Logger and DMM Function)

①-1. 20-07-2006 : Date of today: dd-mm-yyyy

①-2. 10:00:20 : Currently Time: hh:mm:ss

(3-2) Primary Numerical Field (Data Logger and DMM Function)

②-1. DCV : Display the current Function value.

②-2. 012.3 : Display numerical readings. The display updates four times per second

②-3. : The analog bar-graph provides a visual indication of measurement like a traditional analog meter needle.

②-4. AT : AUTO range. The default for “RANGE” is auto-range.

②-5. mV⎓ : Display the current Function indicator.

(3-3) Display the number of logged data item, time and the measured data.

③-1. DATA LOGGER :Time: Displayed Time or Peak for the sampling type

③-2. R/No : Record No. of logged data.

③-3. TIME : Time of logged data.

③-4. READING : Numerical readings

③-5. 10000 10:00:14 000.3mV : Logged data.

③-6. --EOD---: Display when reached Stop address

(3-4) The Command Menu for Data Logger.

④-1. SetUp: Open Setup mode for Data Logger.

④-2. Clear: Erase for Logged data of display.

④-3. Recal: Displays stored readings and buffer statistics.

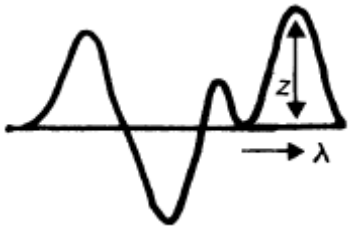
④-4. Start: Start on the Data Logger.

(3-5) The Setup mode for Data Logger.

⑤-1. FUNCTION: : Set the Function of Measurement.

⑤-2. SAMPLE: : Set the Sampling type, Time or Peak

- Time: Sample (interval) Mode
- Peak: Peak Detect Mode. The displayed value update only when a new peak value is detected.



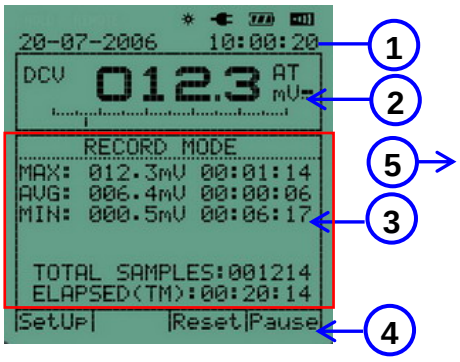
⑤-3. S/TIME(Sec): Set the Sampling interval time, 1Sec to 9,999Sec

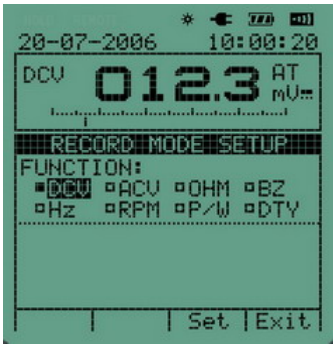
⑤-4. START ADD: Set the Start Address for the Data logger

⑤-5. STOP ADD: Set the Stop Address for the Data logger

4) The Display of DMM mode

(4-1) RECORD MODE





① FUNC →RECORD MODE→ F3 ② Press F1 to open Setup

PATH: FUNC → ↕ →Selects "RECORD MODE"→ F3

(1) Display the Date and Time (Data Logger and DMM Function)

① Refer to Data Logger section.

(2) Primary Numerical Field (Data Logger and DMM Function)

② Refer to Data Logger section.

(3) Display the number of the record data and time.

③-1. MAX: 012.3mV 00:01:14: The displayed value update only when a new maximum value is detected.

③-2. AVG: 006.4mV 00:00:06: The displayed value update only when a new average value is detected.

③-3. MIN: 000.5mV 00:06:17: The displayed value update only when a new minimum value is detected.

③-4. TOTAL SAMPLES:001214: Total quantity for sampling data.

③-5. ELAPSED(TM):00:20:14: Total elapsed time.

(4) The Command Menu for Record mode

④-1. SetUp: Open Setup mode for Record mode

④-2. Reset: All data set to zero.

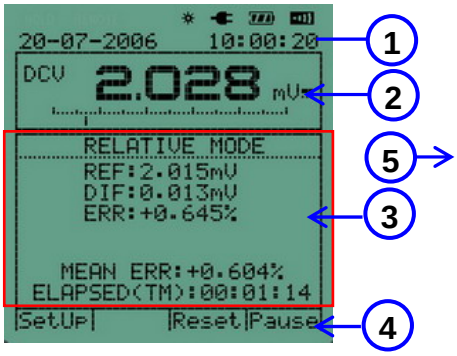
④-3. Pause: Freezes the displayed value for record area.

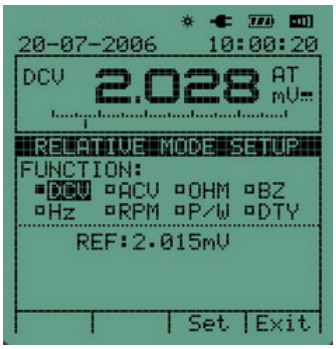
(5) The Setup mode for Record

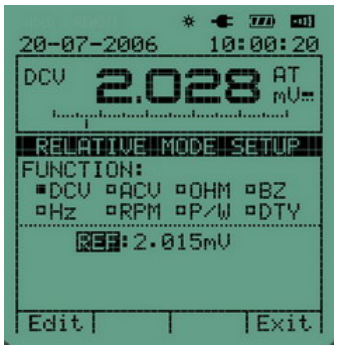
⑤-1. FUNCTION: : Set the Function of Measurement.

Select the proper item of following functions. DCV, ACV, OHM, BZ, FRQ, RPM, P/W or DTY.

(4-2) RELATIVE MODE







① FUNC →RELATIVE MODE→ F3 ② Press F1 to open Setup ③ Press ◆ to change Edit mode

PATH: FUNC →◆→Selects “RELATIVE MODE”→ F3

(1) Display the Date and Time (Data Logger and DMM Function)

① Refer to Data Logger section.

(2) Primary Numerical Field (Data Logger and DMM Function)

② Refer to Data Logger section.

(3) Display the number of the relative data and time.

③-1. REF:2.015mV: Reference value

③-2. DIF:0.013mV: Difference value, Difference = Measured value– Reference (REF)

③-3. ERR:+0.645%: Error rate, ERR % = Difference / Reference x 100

③-4. MEAN ERR:+0.604%: The mean error

③-5. ELAPSED(TM):00:01:14: Total elapsed time

(4) The Command Menu for Relative mode

④ Refer to Record mode.

(5) The Setup mode for Relative

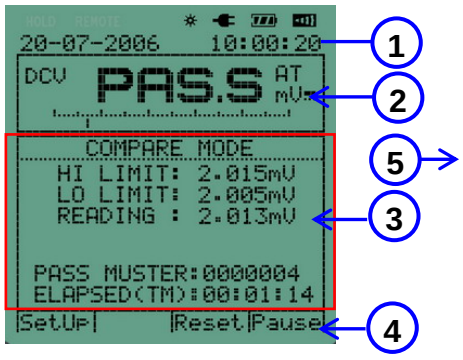
⑤-1. FUNCTION: : Set the Function of Measurement.

Select the proper item of following functions. DCV, ACV, OHM, BZ, FRQ, RPM, P/W or DTY.

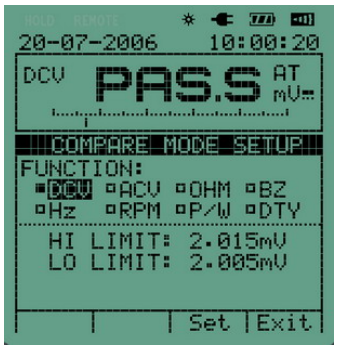
⑤-2. Edit Relative mode Reference point.

(4-3) COMPARE MODE

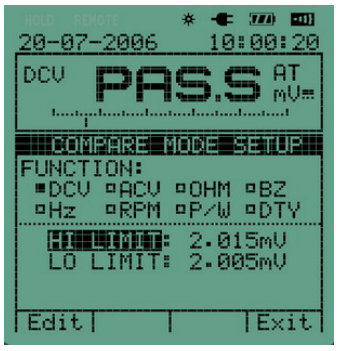
2. Product Description



① FUNC →COMPARE MODE→ F3



② Press F1 to open Setup



③ Press ↕ to change Edit mode

PATH: FUNC →↕→Selects "COMPARE MODE"→ F3

(1) Display the Date and Time (Data Logger and DMM Function)

① Refer to Data Logger section.

(2) Primary Numerical Field (Data Logger and DMM Function)

② This field compares the input value to a high and low limit value. A LO is displayed if the input value is lower than the low limit, PASS if the input value is within the high and low limit values and HI if the input is greater than the high limit.

(3) Display the number of the compare data and time.

③-1. HI LIMIT: 2.015mV: To be set value for HI limit.

③-2. LO LIMIT: 2.013mV: To be set value for LOW limit

③-3. READING : 2.005mV: Reading value

③-4. PASS MUSTER:0000004: Total pass muster

③-5. ELAPSED(TM):00:01:14: Total elapsed time

(4) The Command Menu for Relative mode

④ Refer to Record mode.

(5) The Setup mode for Compare

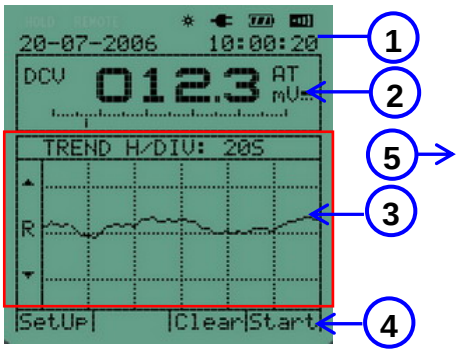
⑤-1. FUNCTION: : Set the Function of Measurement.

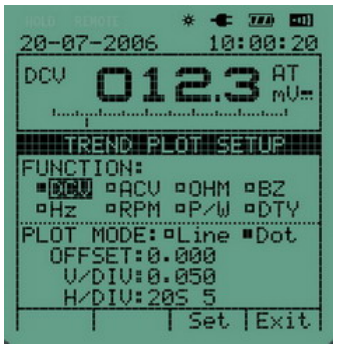
Select the proper item of following functions. DCV, ACV, OHM, BZ, FRQ, RPM, P/W or DTY.

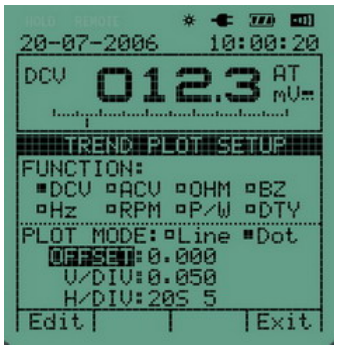
⑤-2. Edit Compare mode high point.

⑤-3. Edit Compare mode low point.

(4-4) TREND PLOT







① FUNC → TREND MODE → F3 ② Press F1 to open Setup ③ Press ▲▼ to change Edit mode

PATH: FUNC → ▲▼ → Selects "TREND PLOT" → F3

(1) Display the Date and Time (Data Logger and DMM Function)

① Refer to Data Logger section.

(2) Primary Numerical Field (Data Logger and DMM Function)

② Refer to Data Logger section.

(3) Display the graph of trend plot.

③-1. TREND H/DIV: 20S: Horizontal Division per div

③-2. R : Displays the graph with the reference value as the center value

(4) The Command Menu

④-1. SetUp: The Reference value, horizontal and vertical axis values (REF, H/Div, V/Div) are displayed.

④-2. Clear: Erase for the graph

④-3. Start: Starts the graph plotting using REF value as the centerline.

(5) The Setup mode for Trend plot

⑤-1 PLOT MODE: ▫Line or ■Dot

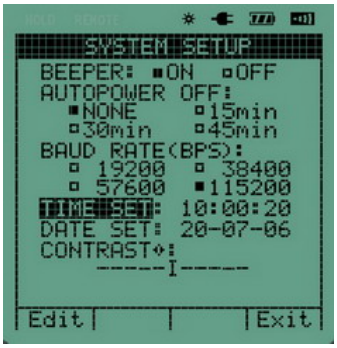
⑤-2 OFFSET: The Offset is the centerline value on the trend graph

⑤-3 V/DIV: V/DIV is the Y axis (amplitude).

⑤-4 H/DIV: H/Div is the X axis (time)

2. Product Description

5) The Display of SYSTEM SETUP mode

		1) Set the Time and Date 1-1) Time: hh:mm:ss 1-2) Date: dd-mm-yyyy
① FUNC → SYSTEM SETUP → F3	② Press ◆ to change Edit mode	

PATH: FUNC → ◆ → Selects “SYSTEM SETUP” → F3

(1) BEEPER: Beeper on/off
(2) AUTOPOWER OFF: Auto power off selection
(3) BAUD RATE(BPS): USB Baud rate selection
(4) TIME SET: Set current time
(5) DATE SET: Set Date of today
(6) CONTRAST: LCD Contrast adjust

2.3.3. The Command Menu

The command menu is changed depends on the function with each function.

Mode	PATH	Command Menu
Function Menu	FUNC	SetUp | | Set | Exit
General Scope	Div: FUNC → G/Scope → F3	SetUp | ◆ | B◆ | Div
	Pos: FUNC → G/Scope → F3 → F4	SetUp | ◆ | B◆ | Pos
	Trigger: FUNC → G/Scope → F3 → TRIG	◆ | Sing| Tmode | Exit
	Store/Recall: FUNC → G/Scope → F3 → H	| Store | Recal | Exit
Data Logger	FUNC → D/Logger → F3	SetUp | Clear | Recal | Start
Multimeter	Record/Relative/Compare FUNC → Record → F3	SetUp | | Reset | Pause
	Trend plot FUNC → Trend → F3	SetUp | | Clear | Start
System setup	FUNC → System setup → F3	| | Set | Exit
	Edit mode: FUNC → System setup → ◆	| Edit | | | Exit

2.4. The USB Interface and Power input terminal

2.4.1. USB INTERFACE

Enables this Meter to communicate with a IBM-compatible Computer over a Universal Serial Bus (USB) in all function ranges.
Connect the meter to the PC using the supplied communication cable. The TRS (tip/ring/sleeve phone plug) end of the cable connects to the meter (top) and USB end connects to the PC USB port.

2.4.2. Power Adaptor Input Terminal

If you are using the AC/DC power adapter, make sure the adapter is plugged into an appropriate live power source.

3. Using the Scope

3.1. Powering the METER

Follow the steps below to power the Meter from a standard AC outlet.

1. Insert Power Adaptor into AC outlet.
2. Connect the Power Adaptor to the Meter.
3. I/O Turn the Meter on by holding this key for about 2 seconds.
4. The meter powers up configured as it was at last power down.

3.2. Changing Backlight

1. Press Backlight ON.
2. Press Backlight OFF.

Note: Using the meter without the backlight increases battery life by 1 hour approximately.

3.3. Selecting "GENERAL SCOPE" in a Menu

Follow steps ① through ③ to open a menu and choose an item.

①	FUNC		Open the FUNCTION menu. ▪ General Scope ▪ Data Logger ▪ Multimeter (4 type) ▪ System Setup
②			Use the arrow keys to highlight the item.
③	F3		Set the "GENERAL SCOPE".

PATH: FUNC → → F3

3.4. Selecting items in SCOPE SETUP menu

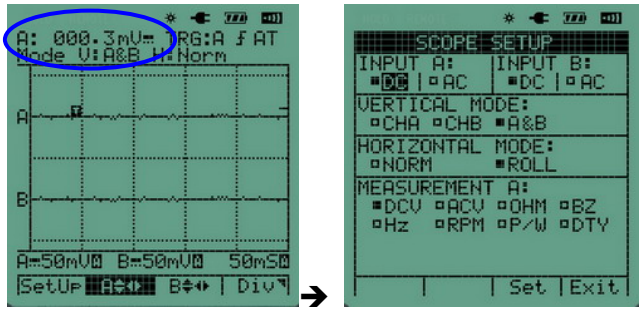
Subsequently follow steps ① to ④ to open a menu and to choose an item.

⓪		Default command menu.
①	F1	Open the Scope Setup menu.
②		Use the arrow keys to highlight an item.
③	F3	Select the proper item.
④	F4	Exit

PATH: F1 → → F3 → F4

3.4.1. Set Frequency measurement for CHA

To choose a Frequency measurement for CHA, do the following:

①	Input jack	Plug the black test lead into the COM input jack and plug the red test lead into the CHA input jack.
②	Start Display → F1	
③		Highlight Hz (□ Hz).
④	F3	Set the Hz (■ Hz).
⑤	F4	Exit
⑥		Observe that Hz is now the main reading. The Frequency Unit appears at the top-left corner of the display area. (Refer to above picture DCV→FRQ)

PATH: F1 → → F3 → F4

3.5. Changing the Graphic Representation

3.5.1. Changing the vertical division

①		If command menu is shown as picture. (SetUp A⇕ B⇕ | Pos)
②	F4	Change command Menu Pos to Div. (SetUp A⇕ B⇕ | Div)
③	▲ or ▼	Change the Vertical Division: Division is changed to manual mode • Pressing ▲ key increases CHA vertical division (A/div). 50mV→0.1V→0.2V→0.5V→1V→2V→5V→10V→20V→50V→100V→200V • Pressing ▼ key decreases CHA vertical division (A/div). 200V→100V→50V→20V→10V→5V→2V→1V→0.5V→0.2V→0.1V→50mV
④	AUTO	Change Div from Manual mode to AUTO mode.

PATH: F4 ➔ ▲,▼ or AUTO

1) Pressing ▲ increases CHA (or CHB) vertical division.
2) Pressing ▼ decreases CHA (or CHB) vertical division.
3) Pressing AUTO will change the division from MANUAL to AUTO (A) mode.

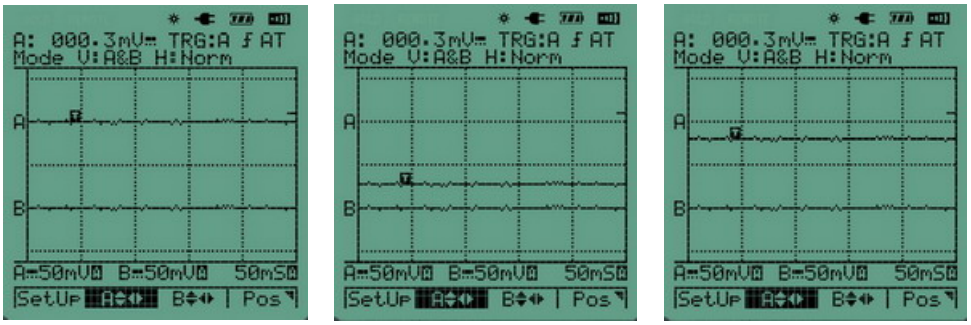
3.5.2. Changing the Horizontal division (Time Base)

①		If command menu is shown as picture. (SetUp A⇕ B⇕ | Pos)
②	F4	Change command Menu Pos to Div. (SetUp A⇕ B⇕ | Div)
③	◀ or ▶	Change the Horizontal Division (Time base) • Pressing ▶ key decreases Horizontal division (H/div). 5S→2S→1S→500mS→…→50uS→20uS→10uS→5uS→2uS→1uS • Pressing ◀ key increases Horizontal division (H/div). 1uS→2uS→5uS→10uS→20uS→50uS→…→500mS→1S→2S→5S
④	AUTO	Change Div from Manual mode to AUTO mode.

PATH: F4 ➔ ◀,▶ or AUTO

1) Pressing ◀ increases the Horizontal Division (Time base).
2) Pressing ▶ decreases the Horizontal Division (Time base).
3) Pressing AUTO will change the division from MANUAL to AUTO (A) mode.

3.5.3. Positioning the Waveform of CH A on the Screen

①	F4	In the case of SetUp A⇕ B⇕ | Div, pressing F4 key change the command menu Div to Pos (SetUp A⇕ B⇕ | Pos).
②		
	▲ or ▼	Default Screen → ▼ → ▲ →

PATH: F4 ➔ ▼ or ▲

1) Pressing ▼ moves the waveform of Channel A downward.

2) Pressing ▲ moves the waveform of Channel A upward.

3.5.4. Positioning the Waveform of CH B on the Screen

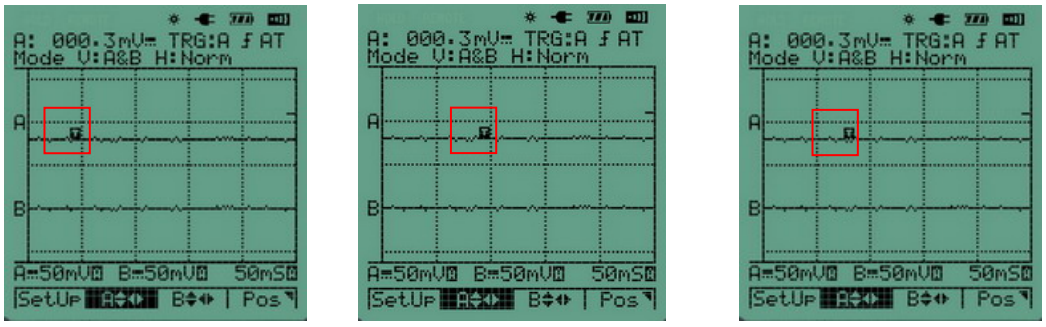
①	F4	In the case of SetUp A⇕ B⇕ | Div, pressing F4 key change the command menu Div to Pos (SetUp A⇕ B⇕ | Pos).
②	F2	Changed the Division of command menu from CHA to CHB Highlight. SetUp | A⇕ B⇕ Pos
③	Next procedure	Same as above the examples “Channel A Positioning the Waveform on the Screen”

PATH: F4 ➔ F2 ➔ ▼ or ▲

1) Pressing ▼ moves the waveform of Channel B downward.

2) Pressing ▲ moves the waveform of Channel B upward.

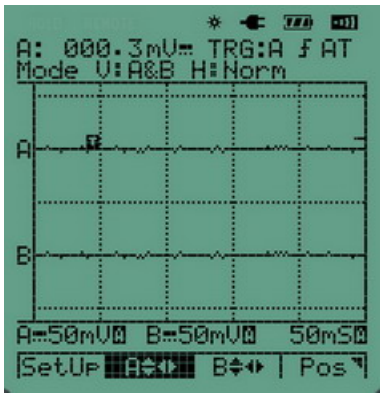
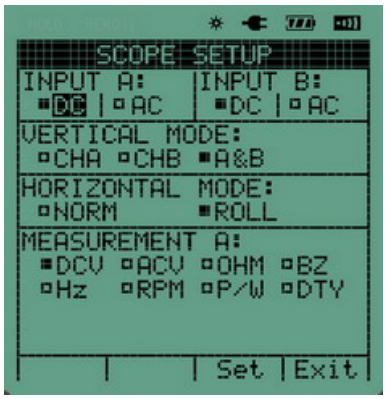
3.5.5. Positioning the Trigger Point Indicator on the Screen

①	F4	In the case of SetUp A⇕ B⇕ | Div, pressing F4 key change the command menu Div to Pos (SetUp A⇕ B⇕ | Pos).
②	◀ Or ▶	
		Default Screen → ▶ → ◀

PATH: F4 ➔ ◀ or ▶

1) Pressing ◀ moves Trigger Point Indicator leftward.
2) Pressing ▶ moves Trigger Point Indicator rightward.

3.6. Acquiring the Waveform

①	Start Display → F1	 →	

3.6.1. Recording slow signals over a Long Period of Time.

②	◀▶▲▼	Highlight ROLL mode.
③	F3	Set the ROLL mode.
④	F4	Exit

PATH: F1 → ◀▶▲▼ → F3 → F4

The ROLL mode function supplies a visual log of waveform activity and is especially useful when you measure lower frequency waveforms.

Note: ROLL MODE operates when the horizontal division is between 1S and 5S.

3.6.2. Selecting AC-Coupling for INPUT A

②	◀▶▲▼	Highlight AC for INPUT A.
③	F3	Set the AC-coupling for INPUT A.
④	F4	Exit

PATH: F1 → ◀▶▲▼ → F3 → F4

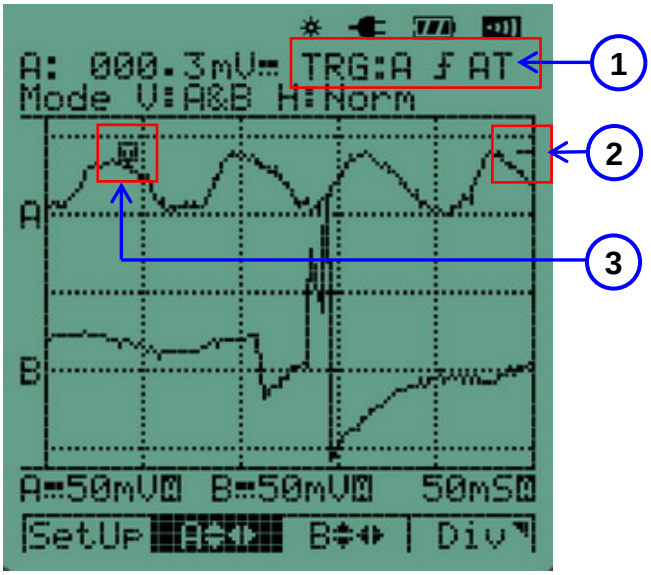
Use AC-coupling when you wish to observe a small AC signal that rides on a DC signal.

3.7. Triggering on a Waveform

Triggering tells the Meter when to begin displaying a waveform. The instructions that follow explain how to:

- Select a Source Channel
- Select rising or falling edge on which to trigger
- Select a Trigger mode
- Define the condition for a new update of the waveform.

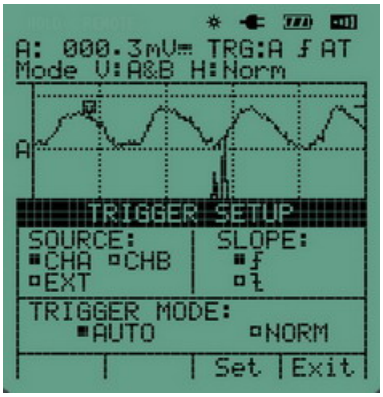
The display icons on the top line (right side) of the LCD identify the trigger parameters currently used. Trigger icons on the screen indicate the trigger level and slope.



①-1. TRG:A : Trigger selection
Channel A, B and External
①-2. ƒ : Rising or falling edge
①-3. AT : Trigger mode
Normal or AUTO
② : Trigger level indicator
③ : Trigger point indicator

3.7.1. Setting Trigger mode (Tmode)

⓪		Default command menu.	SetUp A⇕ B⇕ Div
①	TRIG	Open the Trigger command menu.	Tlvl Sing1 Tmode Exit

②	F3	Open the Trigger Setup.	
③		Highlight the ITEM you want.	
④	F3	Set the ITEM.	
⑤	F4	Exit.	

PATH: TRIG → F3 → → F3 → F4

3.7.2. Setting AUTO Trigger Level

For quick operation, use the AUTO trigger mode to trigger on nearly all signals automatically. To optimize trigger slope manually, do the following:

⓪		Default command menu.	
①	TRIG	Open the Trigger command menu.	
②	F3	Open the Trigger Setup.	
③		Highlight AUTO.	
④	F3	Set AUTO.	
⑤	F4	Exit.	

PATH: TRIG → F3 → → F3 → F4

3.7.3. Setting Normal Trigger mode

③		Highlight NORM.
④	F3	Set NORM.

⑤	F4	Exit.

PATH: TRIG ➔ F3 ➔ ➔ F3 ➔ F4

3.7.4. Setting Trigger Slope

Trigger on either positive Slope or negative Slope of the chosen waveform.

③		Highlight ƒ or ƫ.
④	F3	Set ƒ or ƫ.
⑤	F4	Exit.

PATH: TRIG ➔ F3 ➔ ➔ F3 ➔ F4

3.7.5. Changing the Trigger level Indicator

on NORMal Trigger mode

⓪		Default command menu.
①	TRIG	Open the Trigger command menu.
②	or	Adjust the Trigger Level continuously. Observe the Trigger level indicator (▬) on the rightmost time division line.
③	F4	Exit.

PATH: TRIG ➔ , or F4

1) Pressing moves the Trigger level indicator (▬) downward.
2) Pressing moves the Trigger level indicator (▬) upward.

3.7.6. Making a single acquisition

To catch single events, perform a single shot. (One time screen update.) To set up the Meter for a single shot on the input Channel A waveform:

Connect the probe to the signal to be measured.

⓪		Default command menu.	
①	TRIG	Open the Trigger command menu.	
②	F2	Highlight Singl (SINGLE SHOT). Test tool performs a single shot. (One time screen update)	
③	F2	Return to normal Trigger mode.	

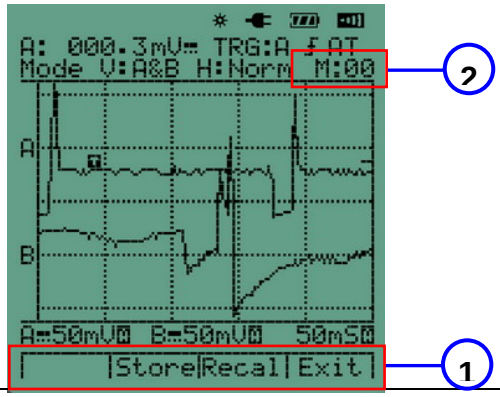
PATH: TRIG → F2 → F2

3.8. Storing and Recalling Screens

The meter can store setups and waveforms to memory for later recall. Sixteen (0-15) setup and waveform memories are available.

3.8.1. Storing Screen

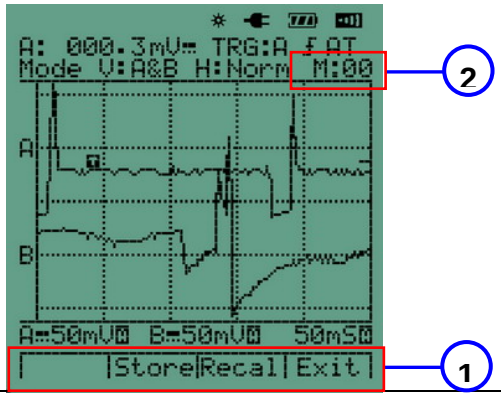
To store a screen, do the following:

⓪		Default command menu.	
①	H	Open the Memory (MEM) menu. ① Memory Menu (Store, Recall, Exit) ② Memory Address (0~15) (M: 00)	
②	▲ ▼	Memory field (M:00) appears at the top-right corner of the display area. Select the memory address where the screen is to be stored.	
③	F2	Store the actual screen	

PATH: H → ▲▼ → F2

3.8.2. Recalling Screen

To recall a screen, do the following:

⓪		Default command menu.	
①	H	Open the Memory (MEM) menu. ① Memory Menu (Store, Recall, Exit) ② Memory Address (0~15) (M: 00)	
②	▲ ▼	Memory field (M:00) appears at the top-right corner of the display area. Select the memory address from which to recall the screen	
③	F3	Recall the screen.	

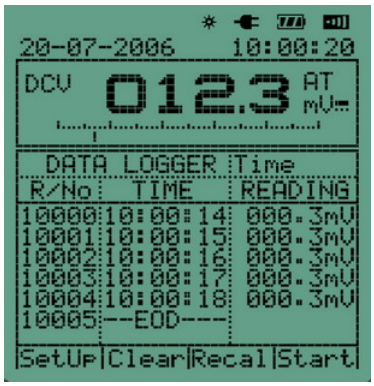
PATH: H → ▲▼ → F3

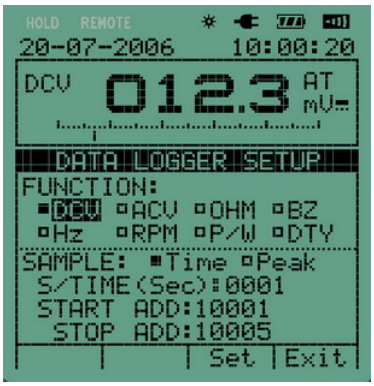
The image is presented as a picture that can no longer be changed.

4. Using the Data Logger

This Meter is designed for record of DCV, ACV, OHM, BZ, FRQ, RPM, Pulse width or Duty cycle with signal from a contact. Values are stored to a non volatile electronic memory. Data transfer to the personal computer for further analysis is performed via USB interface by means of a proper adapter.

Up to 17,000 (optional 35,000) measurements can be stored in memory.





PATH: FUNC → ↕ (DATA LOGGER) → F3 → F1

4.1. Selecting items in Data Logger Setup menu

Follow steps ① through ⑦ to open a menu and choose an item.

①	FUNC	Open the FUNCTION menu.
②	↕	Use the arrow keys to highlight the DATA LOGGER.
③	F3	Set and Open the Data Logger.
④	F1	Open the Data Logger Setup.
⑤	↕↔	Use the arrow keys to highlight the item.
⑥	F3	Set the proper item.
⑦	F4	Exit

PATH: FUNC → ↕ → F3 → F1 → ↕↔ → F3 → F4

4.1.1. Change the Sampling Type

⑤		Use the arrow keys to highlight Sample Type (■ Time or □ Peak).
⑥	F3	Set the item
⑦	F4	Exit

PATH: FUNC → ↕ → F3 → F1 → ↔ → F3 → F4

4.1.2. Change the Sampling interval Time

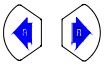
Example] Set the sampling interval time from 1Sec to 10Sec.

⑤		Use the arrow keys to highlight S/Time (Sec).
⑥	F1	Press F1 key to change the Edit mode. [Ex-1] S/Time (Sec): 0000**1**
⑦		• Press ↑ key to increase, ↓ key to decreases the highlighted digit. [Ex-2] S/Time (Sec): 0000**0**
⑧		Move the Cursor to highlights the most significant digit. [Ex-2] S/Time (Sec): 000**0**0
⑨		• Press ↑ key to increase, ↓ key to decreases the highlighted digit. [Ex-3] S/Time (Sec): 00**1**0
⑩	F4	Exit

PATH: FUNC → ↕ → F3 → F1 → ↔ → F1 → ↕ → ◀ ▶ → ↕ → F4

4.1.3. Change the Start/Stop Address

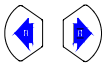
Example] Set the Start address from 10001 to 12001.

⑤		Use the arrow keys to highlight Sampling Time or Start/Stop Address.
⑥	F1	Press F1 key to change the Edit mode. [Ex-1] START ADD: 1000**1**
⑦		Move the Cursor to highlights the most significant digit. [Ex-2] START ADD: 1**0**001
⑧		• Press ↑ key to increase, ↓ key to decreases the highlighted digit. [Ex-3] START ADD: 1**2**001
⑨	F4	Exit

PATH: FUNC → ↕ → F3 → F1 → ↔ → F1 → ◀ ▶ → ↕ → F4

4.2. Start Data logger procedure

1. Insert the BLACK test lead into the input socket marked as ‘COM’.
2. Insert the RED test lead into the input socket marked as ‘CHA’.

3.	FUNC	Open the FUNCTION menu.
4.		Use the arrow keys to highlight the DATA LOGGER
5.	F3	Set and Open the Data Logger.
6.		Select to **DCV** function. The DCV appears at the top-left corner of the display. • Press key to change the Measurement Function: [Ex-1] DTY→P/W→RPM→FRQ→BZ→OHM→ACV→ **DCV** • Press key to change the Measurement Function. [Ex-2] **DCV**→ACV→OHM→BZ→FRQ→RPM→P/W→DTY
7.	 AUTO	Select the auto-range function by pressing AUTO key or use keys to select desired range. • Press key to change the higher range. [Ex-1] 000.1mV→0.001V→00.01V→000.1V • Press key to change the lower range. [Ex-2] 000.1V→00.01V→0.001V→000.1mV • Pressing AUTO key will change the Range to Auto-range (AT)
8.	F4	Press F4 key to Start. Pressing this key again will stop.

PATH: FUNC → → F3 → → → , or AUTO → F4

9. Connect test leads to your source signal and observe the reading shown on the display. If the input signal is beyond the allowed range, an overflow message “OL” will be displayed.

4.2.1. Changing the Measurement Function & Range

To change the Measurement Function and/or Range, do the following.

Or	Measurement Range change. • Press key to change the higher range. [Ex-1] 000.1mV→0.001V→00.01V→000.1V • Press key to change the lower range. [Ex-2] 000.1V→00.01V→0.001V→000.1mV
Or	Measurement Function change. • Press key to change the Measurement Function: [Ex-3] DTY→P/W→RPM→FRQ→BZ→OHM→ACV→ DCV • Press key to change the Measurement Function. [Ex-4] DCV→ACV→OHM→BZ→FRQ→RPM→P/W→DTY

4.3. Recall Data

To recall data from memory in meter, do the following:

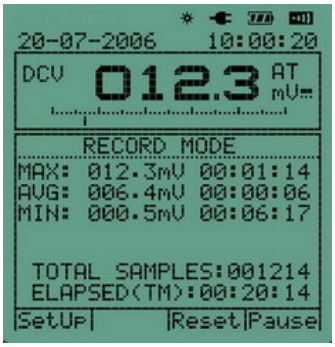
①	FUNC	Open the FUNCTION menu.
②		Use the arrow keys to highlight the DATA LOGGER
③	F3	Set and Open the Data Logger.
④	F3	Press F3 key to recall data.
⑤	or	• Press key to up scroll • Press key to down scroll.

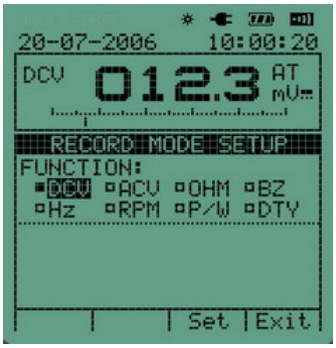
PATH: FUNC → → F3 → F3 → ,

5. Using the Digital Multimeter

5.1. The Display of Digital Multimeter mode

5.1.1. RECORD MODE



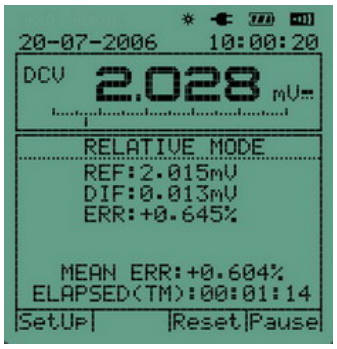


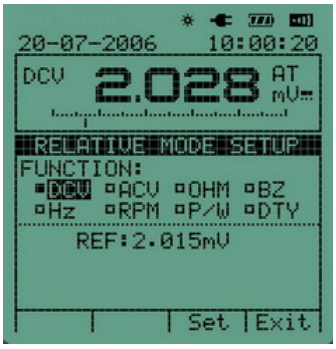
① FUNC → RECORD MODE → F3 ② Press F1 to open Setup

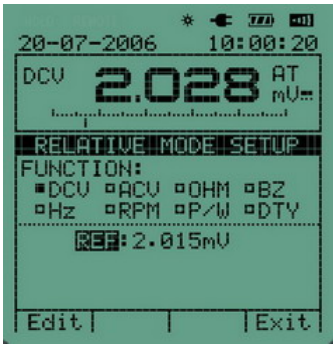
PATH: FUNC → ↕ → Selects "RECORD MODE" → F3

This mode records and displays maximum (MAX), minimum (MIN) and average (AVG) values that the input value deviates over a period of time.
Real Time for MAX or MIN, elapsed time for AVG.

5.1.2. RELATIVE MODE







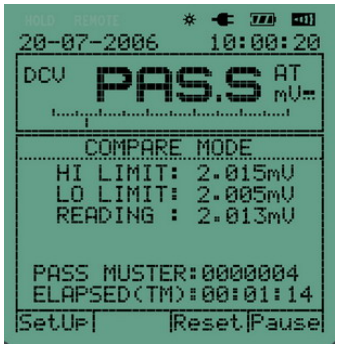
① FUNC → RELATIVE MODE → F3 ② Press F1 to open Setup ③ Press ↕ to change Edit mode

PATH: FUNC → ↕ → Selects "RELATIVE MODE" → F3

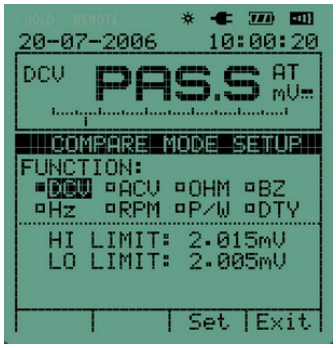
This mode records and displays reference (REF), difference (DIF) and error (ERR) values that the input value deviates over a period of time.
The relative mode measures how much the input value deviates from a reference value and displays the deviation as a % error.
Difference (DIF) = Measured – Reference (REF)

Error (ERR %) = Difference / Reference x 100

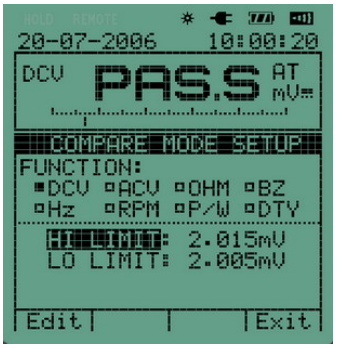
5.1.3. COMPARE MODE



① FUNC → COMPARE MODE → F3



② Press F1 to open Setup



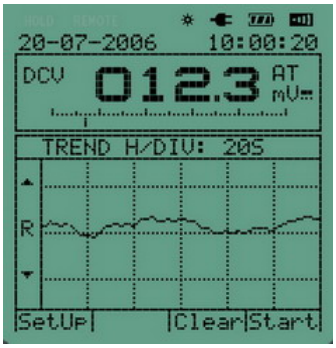
③ Press ▲▼ to change Edit mode

PATH: FUNC → ▲▼ → Selects “COMPARE MODE” → F3

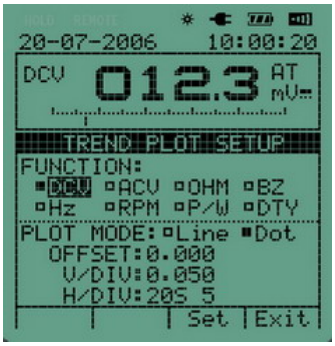
A compare mode to determine if a measurement is within, above, or below a designated range.

This mode compares the input value to a high and low limit value. A -LO- is displayed if the input value is lower than the low limit, PASS if the input value is within the high and low limit values and -HI- if the input is greater than the high limit.

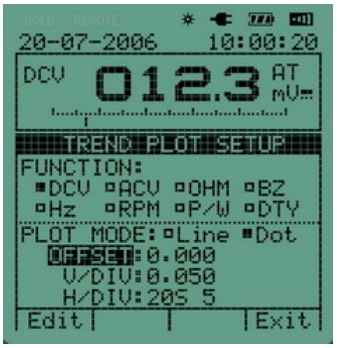
5.1.4. TREND PLOT



① FUNC → TREND MODE → F3



② Press F1 to open Setup



③ Press ▲▼ to change Edit mode

PATH: FUNC → ▲▼ → Selects “TREND PLOT” → F3

Displays the trend graph with the reference value as the center value.

[F1] SetUp: The Reference value, horizontal and vertical axis values (REF, H/Div, V/Div) are displayed. The REF is the centerline value on the trend graph, H/Div is the X axis (time) and V/DIV is the Y axis (amplitude).

[F3] Clear: Erase for the graph on display.

[F4] Start: Starts the graph plotting using REF value as the centerline.

5.2. Measurement Procedures

- Voltage Measurements

CAUTION! Do not attempt to make a voltage measurement if a test lead is plugged in the CHB or EXT.TRIG input jack, instrument damage and/or personal injury may result.

WARNING! 1. To avoid the risk of electrical shock and instrument damage, input voltages must not exceed 1,000V DC or 600V AC rms. Do not attempt to make any unknown voltage measurement that may be in exceed of 1, 000V DC or 600V AC rms.

2. Always keep your fingers behind the finger guards on the probe when making measurements.

5.2.1. DC V

- Applications

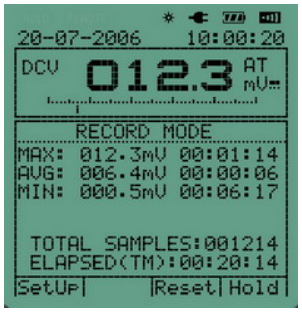
  DCV: Voltage of the battery and DC circuit are measured.

- Measuring ranges

  4 ranges from 1,000mV to 1,000V

- Measurement procedure

1. Insert the BLACK test lead into the input socket marked as ‘COM’.
2. Insert the RED test lead into the input socket marked as ‘CHA’.

3.	FUNC	Open the FUNCTION menu.
4.		Highlight Digital Multimeter (Record, Relative, Compare or Trend).
5.	F3	 Open the selected item. This example is selected Record mode.
6.	or	Select to **DCV** function. The DCV appears at the top-left corner of the display. • Press key to change the Measurement Function: [Ex-1] DTY→P/W→RPM→FRQ→BZ→OHM→ACV→ **DCV** • Press key to change the Measurement Function. [Ex-2] **DCV**→ACV→OHM→BZ→FRQ→RPM→P/W→DTY

7.	or AUTO	Select the auto-range function by pressing AUTO key or use keys to select desired range. • Press key to change the higher range. [Ex-1] 012.3mV→0.123V→01.23V→012.3V • Press key to change the lower range. [Ex-2] 012.3V→01.23V→0.123V→012.3mV • Pressing AUTO key will change the Range to Auto-range (AT)

PATH: FUNC → → F3 → or → , or AUTO

8. Connect test leads to your source signal and observe the reading shown on the display. If the input signal is beyond the allowed range, an overflow message “OL” will be displayed.

5.2.2. AC V

- Applications

ACV: Sine wave AC voltage such as lighting voltage is measured.

- Measuring ranges

4 ranges from 1,000mV to 750V.

- Measurement procedure

1. Insert the BLACK test lead into the input socket marked as ‘COM’.
2. Insert the RED test lead into the input socket marked as ‘CHA’.
3. Change the mode to Digital Multimeter. (Or skip this step if Digital Multimeter mode is set)
   Path: FUNC → → F3 (Record, Relative, Compare mode or Trend plot)
4. Select **ACV** with the or key. The **ACV** appears at the top-left corner of the display area.
5. Select the auto-range function by pressing AUTO key or use , keys to select desired range.
6. Connect test leads to your source signal and observe the reading shown on the display. If the input signal is beyond the allowed range, an overflow message “OL” will be displayed.

Note.

The LCD will display the measured value along with the Bar graph.

If the voltage is too high, the measurement range will be changed to the next higher range automatically.

5.2.3. Resistance

- Resistance Measurements

CAUTION! Do not attempt to make a voltage measurement if a test lead is plugged in the CHB or EXT.TRIG input jack, instrument damage and/or personal injury may result.

WARNING! Turn off power and discharge all capacitors in the circuit to be tested before making in-circuit resistance measurements. Accurate measurement is not possible if external or residual voltage is present.

- Applications

Resistance of resistors and circuits are measured.

- Measuring ranges

4 ranges from 5kΩ to 5MΩ.

- Measurement procedure

1. Insert the BLACK test lead into the input socket marked as ‘COM’.
2. Insert the RED test lead into the input socket marked as ‘CHA’.
3. Change the mode to Digital Multimeter. (Or skip this step if Digital Multimeter mode is set)
   Path: FUNC → → F3 (Record, Relative, Compare mode or Trend plot)
4. Select **OHM** with the ◀ or ▶ key. The **OHM** appears at the top-left corner of the display area.
5. Select the auto-range function by pressing AUTO key or use ▲,▼ keys to select desired range.
6. Connect test leads to your source signal and observe the reading shown on the display. If the input signal is beyond the allowed range, an overflow message “OL” will be displayed.

5.2.4. Continuity

- Applications

Checking the continuity of wiring and selecting wires

- How to use

1. Insert the BLACK test lead into the input socket marked as ‘COM’.
2. Insert the RED test lead into the input socket marked as ‘CHA’.
3. Change the mode to Digital Multimeter. (Or skip this step if Digital Multimeter mode is set)
   Path: FUNC → → F3 (Record, Relative, Compare mode or Trend plot)
4. Select **BZ** with the ◀ or ▶ key. The **BZ** appears at the top-left corner of the display area.

5. Connect test leads to your source signal. The measured value will be shown on the display automatically. The Meter “beeps” when measured resistance value is lower than threshold value.

5.2.5. Frequency

CAUTION! Do not attempt to make a voltage measurement if a test lead is plugged in the CHB or EXT.TRIG input jack, instrument damage and/or personal injury may result.

WARNING! 1. Never attempt a frequency measurement with a voltage source greater than 600V AC rms. Determine the voltage of any unknown frequency source before connecting the instrument in frequency mode.

2. Always keep your fingers behind the finger guards on the probe when making measurements.

- Applications

Frequency of an AC circuit is measured.

- Measuring ranges [Full Auto Range]

6 ranges from 100Hz to 10MHz. (The guaranteed range is below 5 MHz.)

- Measurement procedure

1. Insert the BLACK test lead into the input socket marked as ‘COM’.
2. Insert the RED test lead into the input socket marked as ‘CHA’.
3. Change the mode to Digital Multimeter. (Or skip this step if Digital Multimeter mode is set)
   Path: FUNC ➔ ➔ F3 (Record, Relative, Compare mode or Trend plot)
4. Select **FRQ** with the or key. The **FRQ** appears at the top-left corner of the display area.
5. Connect test leads to your source signal and observe the reading shown on the display. If the input signal is beyond the allowed range, an overflow message “OL” will be displayed.

5.2.6. RPM

- Applications

RPM is measured.

- Measurement procedure

1. Insert the BLACK test lead into the input socket marked as ‘COM’.
2. Insert the RED test lead into the input socket marked as ‘CHA’.
3. Change the mode to Digital Multimeter. (Or skip this step if Digital Multimeter mode is set)
   Path: FUNC ➔ ➔ F3 (Record, Relative, Compare mode or Trend plot)

4. Select **RPM** with the ◀ or ▶ key. The **RPM** appears at the top-left corner of the display area.
5. Connect test leads to your source signal and observe the reading shown on the display.

5.2.7. Pulse Width

- Applications

Pulse Width is measured. [Full Auto Range]

- Measurement procedure

1. Insert the BLACK test lead into the input socket marked as 'COM'.
2. Insert the RED test lead into the input socket marked as 'CHA'.
3. Change the mode to Digital Multimeter. (Or skip this step if Digital Multimeter mode is set)
   Path: FUNC ➔ ◀▶ ➔ F3 (Record, Relative, Compare mode or Trend plot)
4. Select **P/W** with the ◀ or ▶ key. The **P/W** appears at the top-left corner of the display area.
5. Connect test leads to your source signal and observe the reading shown on the display.

5.2.8. Duty

- Applications

Duty Cycle is measured.

- Measurement procedure

1. Insert the BLACK test lead into the input socket marked as 'COM'.
2. Insert the RED test lead into the input socket marked as 'CHA'.
3. Change the mode to Digital Multimeter. (Or skip this step if Digital Multimeter mode is set)
   Path: FUNC ➔ ◀▶ ➔ F3 (Record, Relative, Compare mode or Trend plot)
4. Select **DTY** with the ◀ or ▶ key. The **DTY** appears at the top-left corner of the display area.
5. Connect test leads to your source signal and observe the reading shown on the display.

6. System Setup

Set Beeper, Auto Power off, BAUD Rate for USB, Time, Date and Contrast of the METER

6.1. Change the Beeper of System.

The “BEEPER:” allows you to change the beeper state to ON or OFF.
The meter beeps when the factory settings are restored.
When ON, an audible beep will sound when you press any front panel keys.
Path: FUNC ➔ ◆ SYSTEM SETUP ➔ F3

6.2. Auto Power Off

The Auto Power Off mode turns the meter off automatically to extend battery life.
When not used for very long time, it would be better to turn this switch off than to depend on the auto power off function (Sleep mode), which can make battery drained if the meter remains on for longer than about 2 hours.

6.3. Set the BAUD RATE (BPS) of USB

To change the BAUD Rate (BPS), do the following.

①		Press FUNC →SYSTEM SETUP→ F3 to open SYSTEM SETUP mode.
②	◆	Use the arrow keys to highlight the one of item for “BAUD RATE(BPS):”.
③	F3	Set the item. (Fixed 115200)
④	F4	Exit

Path: FUNC ➔ ◆ ➔ F3 ➔ F4

6.4. Change the Current Date and the Time

		1) Set the Time and Date 1-1) Time: hh:mm:ss 1-2) Date: dd-mm-yy
① FUNC →SYSTEM SETUP→ F3	② Press ▲▼ to change Edit mode	

6.4.1. The Current Time set procedure

“TIME SET:” allows you to set the time of the real-time clock. Enter the time in 24 hour, HH:MM:SS format, using the keypad. Valid hour (HH) values are from 00 to 23. Valid minute (MM) and second (SS) values are from 00 to 59.

To change the Current Time, do the following.

1. Press FUNC →SYSTEM SETUP→ F3 to open SYSTEM SETUP mode.
2. Select “TIME SET:” with the ▲ or ▼ key. So, the “Edit” appears at the bottom-left corner of the display area.
3. Press F1 key to change the Edit mode.
4. Press ◀ or ▶ key. The cursor indicates the End of value. (hh:mm:s**s**)
5. Press ▲, ▼, ◀ or ▶ to set time.
   The blink cursor is moved to leftward with ◀ and to rightward with ▶ key.
   Pushing the ▲ key will increase the value of the blinking digit.
   Pushing the ▼ key will decrease the value of the blinking digit.

6.4.2. The Current Date set procedure

“DATE SET:” allows you to set the date of the real-time clock. Enter the date in the DD-MM-YY format using the keypad. Valid year (YY) values are 00 through 99. Valid month (MM) values are from 01 to 12, and valid day values are from 01 to 31.

To change the Current Date, do the following.

1. Press FUNC →SYSTEM SETUP→ F3 to open SYSTEM SETUP mode.

2. Select “DATE SET:” with the ▲ or ▼ key. So, the “Edit” appears at the bottom-left corner of the display area.
3. Press F1 key to change the Edit mode.
4. Press ◀ or ▶ key. The cursor indicates the End of value. (dd:mm:y<u>y</u>)
5. Press ▲, ▼, ◀ or ▶ to set date.
   The blink cursor is moved to leftward with ◀ and to rightward with ▶ key.
   Pushing the ▲ key will increase the value of the blinking digit.
   Pushing the ▼ key will decrease the value of the blinking digit.

7. Specifications

7.1. General Specifications

- Operational Temperature:
  +32°F to +122°F (0°C to +50°C)
- Operational Relative Humidity:
  < 75%
- Storage conditions:
  -4°F to 140°F (-20°C to +60°C); < 75%RH
- Temperature Coefficient:
  0.1 x (Specified Accuracy) per °C for temperature <64.4°F (18°C) to >82.4°F (28°C)
- Max. Voltage Input and Ground:
  DC or AC 600Vrms
- Basic DC Accuracy:
  0.3%
- Scope Bandwidth
  5 MHz
- Meter AC Bandwidth:
  20 kHz
- Power Supply
  Li-ION Battery 3.7V
- Battery Life:
  4 Hours with Backlight OFF, 3 Hours with Backlight ON
- Battery Charge Time
  3 Hours approx.
- Battery Charge information
  Class-2 transformer, Input: 120-240V AC 50/60Hz, Output: 5V DC 1A
- Display Type:
  Super-Twist 132 x 128 pixels
- Equipment Dimensions:
  3.5”(90mm) width x 7.7”(195mm) depth x 1.6”(40mm) height
- Equipment Weight:
  1.0 lbs. (480g) approx. without Holster

7.2. Technical Specification

Note: Accuracy in specified at 23°C ± 5°C (75°F ± 9°F) with relative humidity up to 80% for a period of one year after calibration.

7.2.1. The General Oscilloscope Function

- Horizontal

Sample Rate	50 MS/s (Single CH mode), 25 MS/s (Dual CH mode)
Record Length	512 single shot mode, 256 in all modes
Sample / Division	25
Update Rate	Real Time
Modes	Single shot, Roll, Normal
Accuracy	0.01%
Sweep Rate	1uS to 5S in 1, 2, 5 sequence

- Vertical

Bandwidth	5MHz
Resolution	8 Bit
Channels	Dual
Coupling	AC, DC
Input impedance	1 MΩ
Accuracy	3%±1Pixel
Max. Input Volts	DC or AC 600Vrms
Volt / Division	50 mV to 500V in 1, 2, 5 sequence

- Triggering

Type	CHA, CHB, External
Coupling	AC, DC
Slope	Rising (↑) or Falling (↓) edge
Internal Trigger Sensitivity	2 / 20 Division

- Waveform Memory

Waveform Memory	16 Shots

7.2.2. The Data Logger Function

Data Logger Memory	17,000 Points, Optional: 35,000 Points
Sampling Mode	Peak, Sampling Time
Sample Rate	Max. 0.25S/s
Sampling interval	From 1 second to 9,999 seconds
Clock	Real Time Clock (RTC)

7.2.3. The Digital Multimeter Function

- Programmable: Record (MAX, MIN, AVG), Relative (REF, ERR), Compare (GO-NOGO)
- Trend plot

● DC V

Scope V/Div	DMM Range	Resolution	Accuracy	Impedance
50m, 0.1, 0.2	1000mV	0.1mV	±(0.3%+3)	1 MΩ
0.5, 1, 2	10V	0.001V		
5, 10, 20	100V	0.01V		
50, 100, 200,1000	1000V	0.1V	±(0.5%+5)	

● AC V

Scope V/Div	DMM Range	Resolution	Accuracy			Impedance
			50~450Hz	0.45k~5kHz	5k~20kHz	
50m, 0.1, 0.2	500mV	0.1mV	±(0.75%+5)	±(2%+5)	±(3.5%+5)	1 MΩ
0.5, 1, 2	5V	0.001V				
5, 10, 20	50V	0.01V				
50, 100, 200,500	750V	0.1V	±(1.2%+5)	±(2.5%+5)	N/C	

The Voltage for more than 200V in Frequency range 5kHz to 20kHz: Not Specification

● OHM

Scope V/Div	DMM Range	Resolution	Accuracy	Impedance
1 kΩ	5 kΩ	0.001 kΩ	±(0.5%+5)	600V DC or AC rms
10 kΩ	50 kΩ	0.01 kΩ		
100 kΩ	500 kΩ	0.1 kΩ		
1 MΩ	5 MΩ	0.001 MΩ	±(0.75%+10)	

7. Specifications

- Continuity Buzzer

Test Voltage	Threshold	Over Load Protection
1.7V	100 digits	600V DC or AC rms

- Frequency [Full Auto Range]

Range	Resolution	Accuracy	Overload protection
100 Hz	0.01 Hz	±(0.05%+5)	600V DC or AC rms
1 kHz	0.0001 kHz		
10 kHz	0.001kHz		
100 kHz	0.01kHz		
1 MHz	0.0001MHz		
10 MHz	0.001MHz		

The guaranteed range is below 5 MHz.

- RPM

Range	Resolution	Accuracy
0 – 9,999	1 RPM	±(0.05%+5)

- Pulse Width [Full Auto Range]

Range	2uS-500mS (Pulse Width > 2uS)

- % Duty

Range	25% - 75%

8. Remote Interface Operations

This section explains how to install the USB device driver.
If you have any questions after reading this information, please contact your local service representative.
Remote Interface is Optional.

8.1. USB HID Device Installation

8.1.1. System Requirements

Desktop or Laptop computer with:
1) The IBM PC or Compatible Computer.
2) The Windows operating system: Refer to the Readme file in CD-ROM.
3) The CD-ROM Drive
4) USB Port for Connection with Instrument
This is restricted to devices that have USB ports and for which the manufacturer of the computer guarantees the operation of the USB port.

8.1.2. Operating System

- Microsoft Windows 2K/XP/2K3 or above

8.2. Verifying the computer's USB port

1) Ensure that the USB LoggerScope is plugged in.
2) Pressing I/O key for 1 to 2 seconds will turn the unit on.
3) Right click on the My Computer icon and open [Properties].
4) Select the [Hardware] tab and click the [Device Manager] button to open [Device Manager].
5) Check that [Human Interface Device] is displayed.
* If [Human Interface Device] is not displayed, the USB device driver cannot be used.

8.2.1. Installing the HID Device

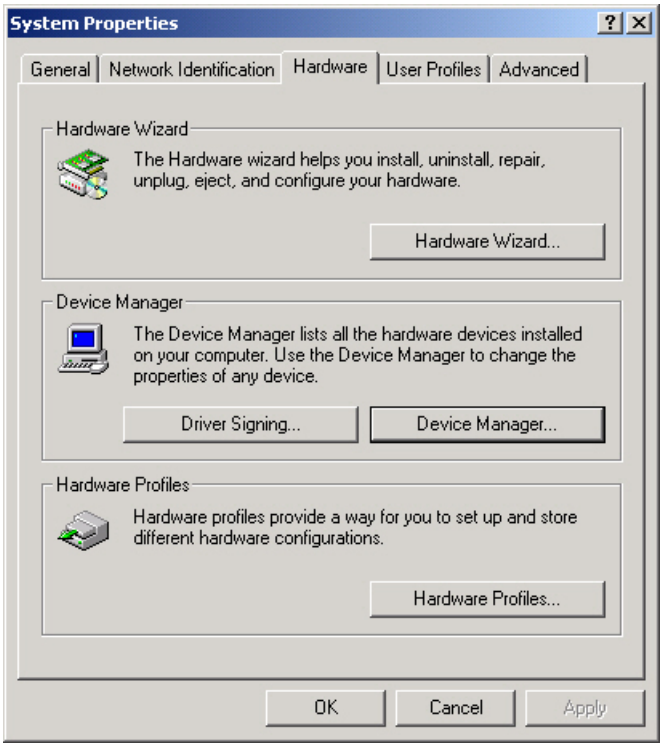
1) Plug in the 4 Pin type into the USB port on the Meter, and connect the USB connector type on the other end of the cable to the host USB port in your PC.
2) Pressing I/O key for 1 to 2 seconds will turn the unit on.
3) The Windows operating system displays "Found New Hardware" and automatically installs the Human Interface Device (HID) driver. HIDs do not require a custom USB driver.

8. Remote Interface Operations

Support for HIDs is built into Windows.

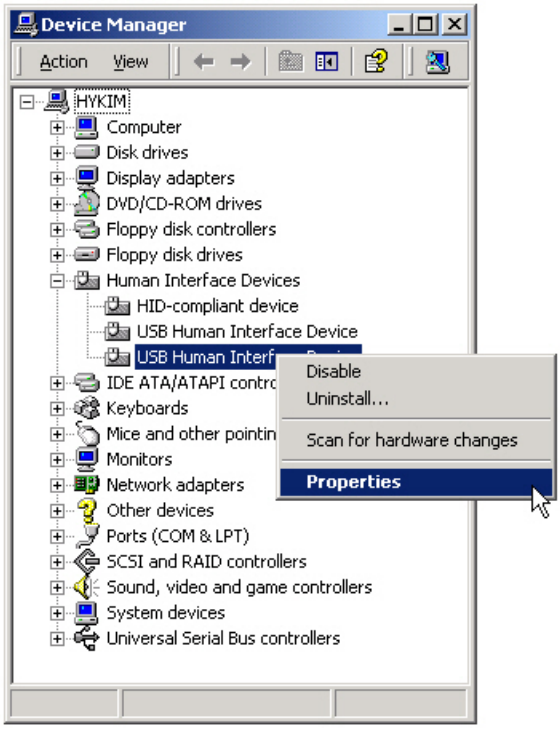
4) Review the status of the HID using the Device Manager.

5) Right click on My Computer to open the System Properties - Hardware dialog. Then click on Device Manager.



[Figure 1: System Properties]

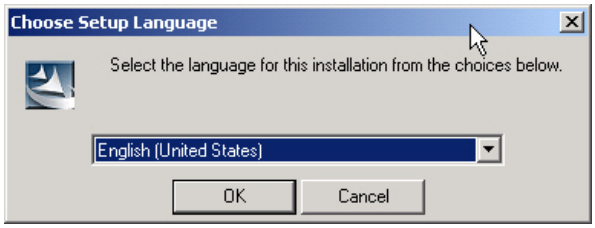
6) Right click on the Human Interface Device to open the Properties dialog which contains the description and status of the HID device.



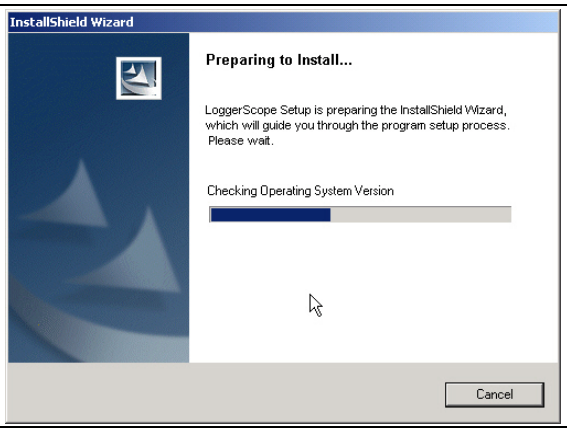
[Figure 2: Device Manager]

8.3. To install Windows Application Software

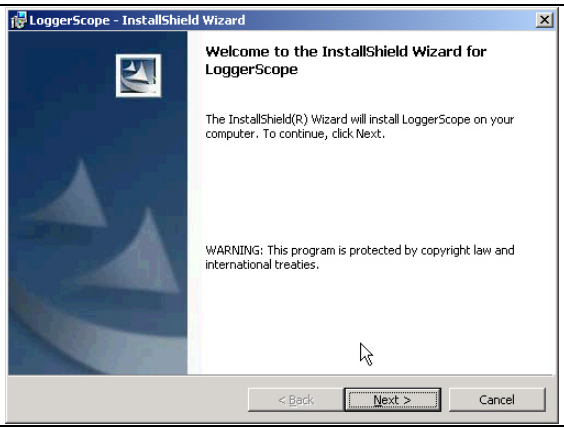
1) Insert the LoggerScope software installation guide CD into the CD-ROM drive of your PC.
2) Open Windows® Explorer and double-click the CD-Rome drive.
3) Auto Run or Windows users can simply double click on Setup.exe'.



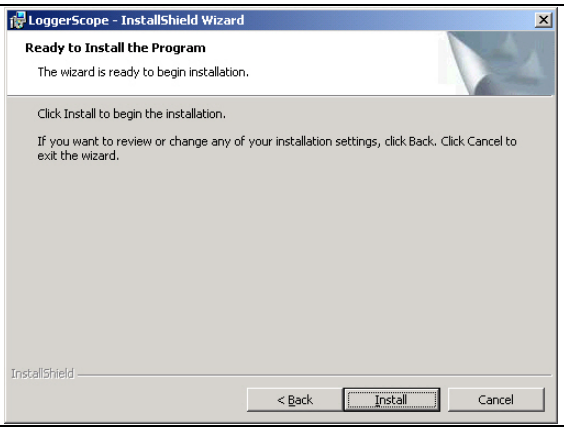
[Step 1: Choose Setup Language]



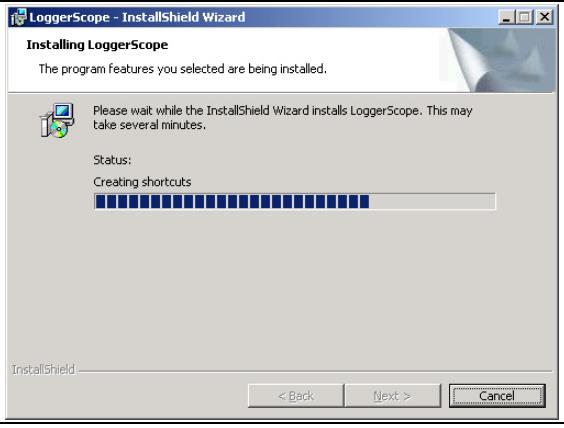
[Step 2: Preparing to Install]



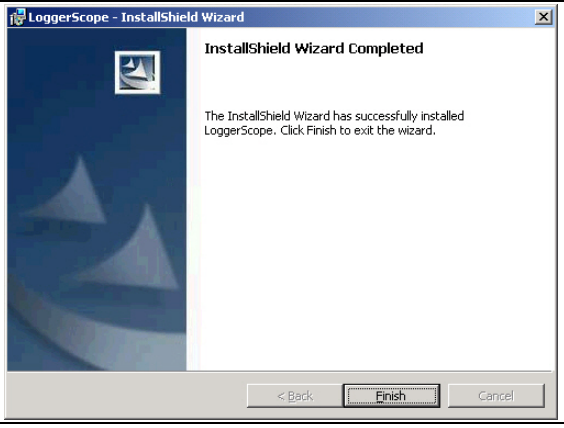
[Step 3: Welcome to the… LoggerScope]



[Step 4: Ready to Install the Program]



[Step 5: Installing LoggerScope]



[Step 6: Installed Wizard Completed]

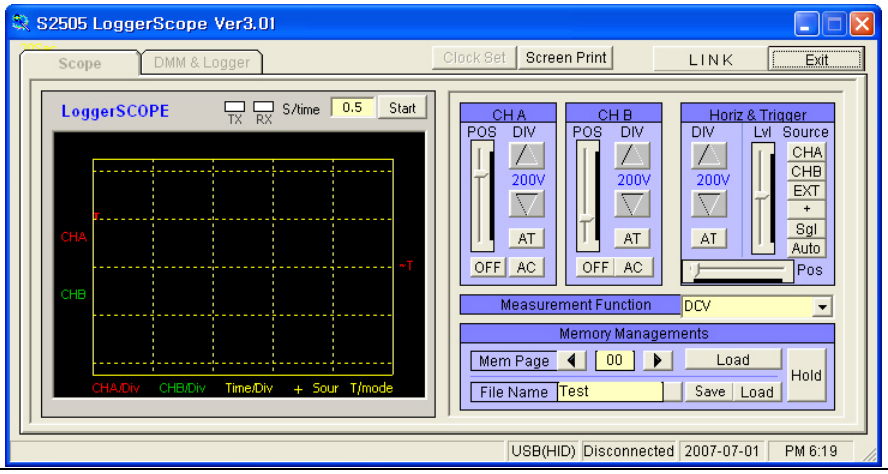
8.4. Running the Application Software

1) For using USB port your PC should have USB port. Connect USB cable to LoggerScope at one end and to PC at other end.

2) Turn the LoggerScope on.

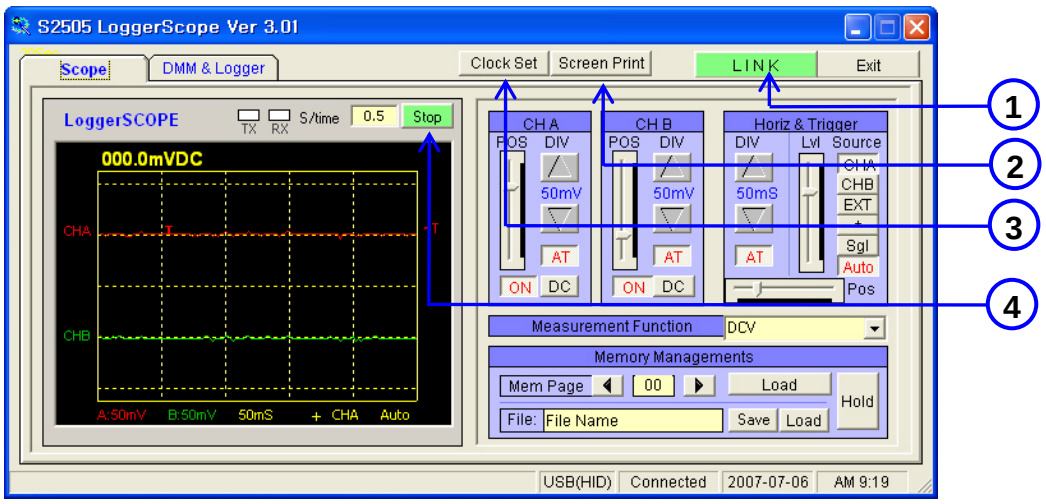
3) **Click** [Start→Programs→Handy Scope→LoggerScope→LoggerScope]

The LoggerScope window will pop up as below

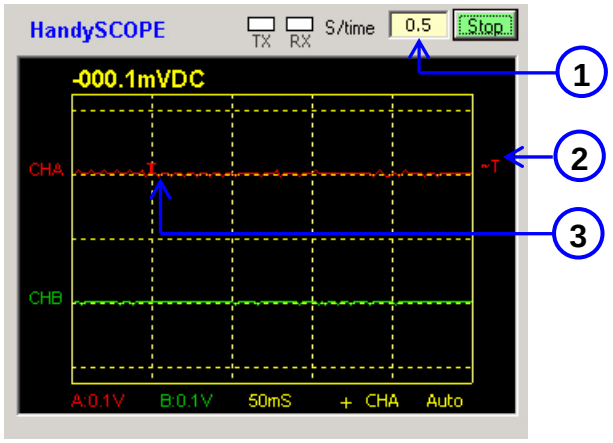


8.4.1. Oscilloscope Mode

1) Click the [LINK] Button and the [Start] Button.

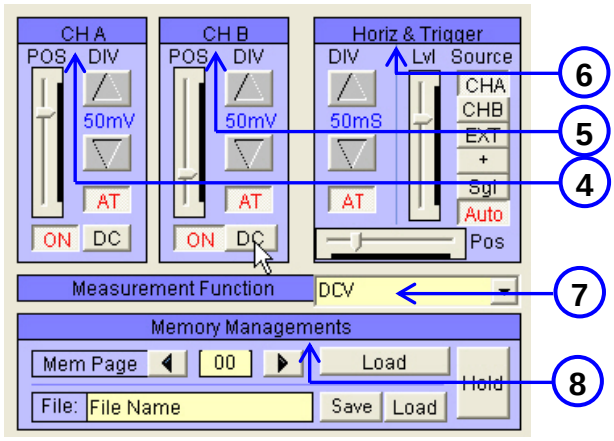


①LINK Button, ②Screen Print,
③Set the System Time and Date ④Start / Stop Button



Display Area

① Sampling Time (0.001 to 9999)
② Trigger level indicator (-T)
③ Trigger point indicator (T)

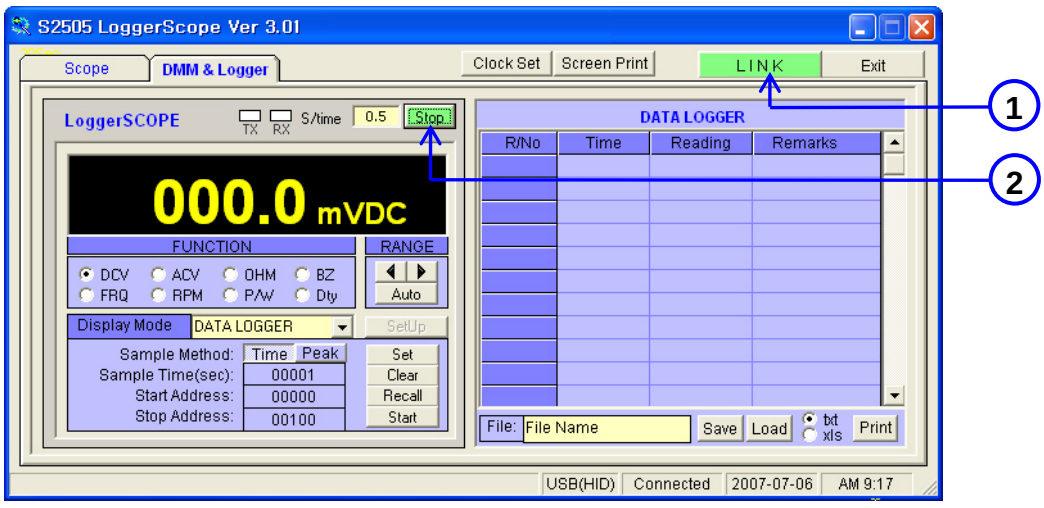


Control Panel Area

④ Channel A (Vertical Position, Division, Auto, ON/Off and DC coupling)
⑤ Channel B (Vertical Position, Division, Auto, ON/Off and DC coupling)
⑥ Horizontal Division and Trigger (Horizontal Division, Auto, Trigger Level, Source and Position)
⑦ Measurement Function (DCV, ACV, OHM, BZ, Hz, RPM, Pulse Width and Duty)
⑧ Storing and Recalling Screens

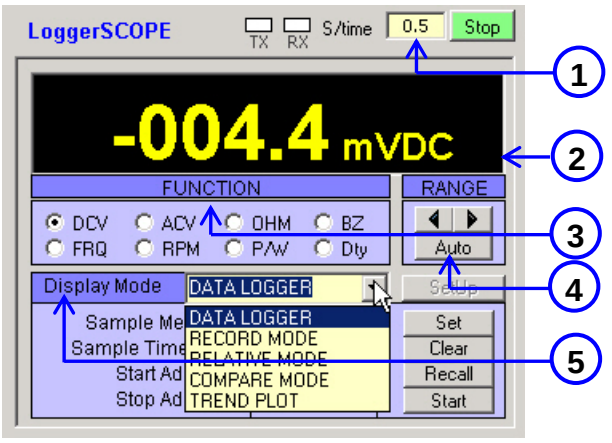
8.4.2. DMM & Data Logger Mode

1) Click the [DMM & Logger] tap



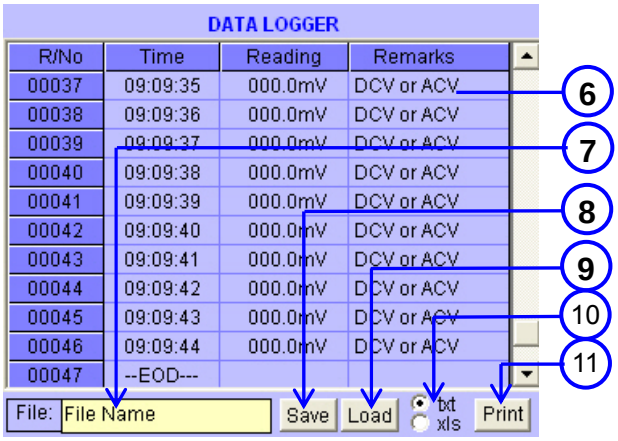
① LINK Button, ② Start / Stop Button

2) Click the [Start] Button



Control Panel Area for DMM & Logger

① Sampling Time (0.001 to 9999)
② Primary Numerical Field (Data Logger and DMM Function)
③ Set the Function of Measurement
④ Range of Measurement
⑤ Display Mode

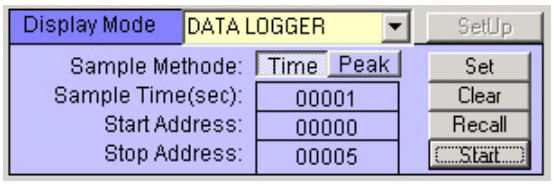


Data Display Area for Data Logger

⑥ Display the number of logged data No., Time and the measured data. (EOD: End of Data)
⑦ File Name for the Save
⑧ Save the logged data to PC.
⑨ Load the logged data from PC.
⑩ To be Saved File Type (Text or Excel file)
⑪ Print Button

8.4.3. Display Mode for DMM & Data Logger Mode

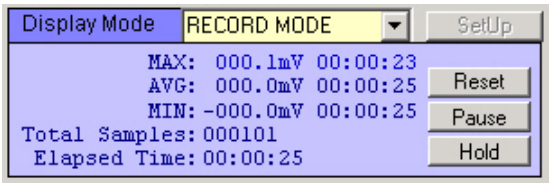
DATA LOGGER MODE



- Sample Method:
  Time: Sample (interval) Mode
  Peak: Peak Detect Mode
- Sample Time: Sampling interval time, 1Sec to 9,999Sec
- Start Address: Set the Start Address
- Stop Address: Set the Stop Address (to 17,000)

- **Set**: Set Button for Data Logger
- **Clear**: Erase for Logged data of display
- **Recall**: Displays stored readings and buffer statistics
- **Start**: Start on the Data Logger

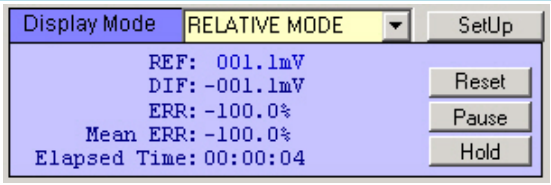
RECORD MODE



- MAX/ AVG/ MIN: update only when a new maximum/ average/ minimum value is detected.
- Total Samples: Total quantity for sampling data
- Elapsed Time: Total elapsed time

- **Reset**: All data set to zero
- **Pause**: Freezes the displayed value for record area
- **Hold**: Freeze the screen at any time.

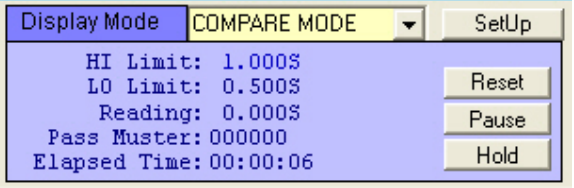
RELATIVE MODE



- REF: Reference value
- DIF: Difference value, Difference = Measured value– Reference
- ERR: Error rate, ERR % = Difference / Reference x 100
- Mean ERR: The mean error
- Elapsed Time: Total elapsed time

- **SetUp**: Open Setup mode for Relative mode
- **Reset**: All data set to zero
- **Pause**: Freezes the displayed value for Relative area
- **Hold**: Freeze the screen at any time.

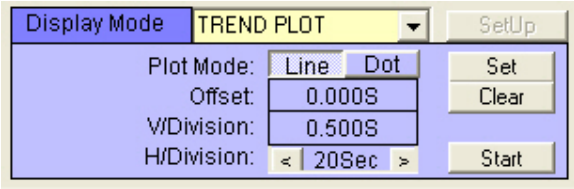
COMPARE MODE



- HI Limit: To be set value for HI limit
- LO Limit: To be set value for LOW limit
- Reading: Reading value
- Pass Muster: Total pass muster
- Elapsed Time: Total elapsed time

- **SetUp**: Open Setup mode for Compare mode
- **Reset**: All data set to zero
- **Pause**: Freezes the displayed value for Compare area
- **Hold**: Freeze the screen at any time.

TREND PLOT MODE



- Plot Mode: Line or Dot
- Offset: The centerline value on the trend graph
- V/Division: V/DIV is the Y axis (amplitude).
- H/Division: H/Div is the X axis (time)

- **Set**: The Plot mode, Offset, Horizontal and Vertical axis values are displayed.
- **Clear**: Erase for the graph
- **Start**: Starts the graph plotting using Offset value as the centerline.

9. Maintaining the Meter

⚠ **Warning!**

- This section is very important for safety. Read and understand the following instruction fully and maintain your instrument properly.
- The instrument must be calibrated and inspected at least once a year to maintain the safety and accuracy.

9.1. About this Chapter

This chapter covers basic maintenance procedures that can be performed by the user and provides handling, cleaning, battery replacement, disassembly, and assembly instructions.

9.2. Static Safe Handling

Observe the following rules for handling static-sensitive devices:

1. Handle all static-sensitive components at a static-safe work area.
   Use grounded static control table mats on all repair meters, and always wear a grounded wrist strap. Handle boards by their nonconductive edges only. Store plastic, vinyl, and Styrofoam objects outside the work area.
2. Store and transport all static-sensitive components and assemblies in static shielding bags or containers. Static shielding bags and containers protect components and assemblies from direct static discharge and external static fields. Store components in their original packages until they are ready for use.

9.3. Cleaning the Meter

⚠ **Warning!**

To avoid electrical shock or damage to the meter, never allow water inside the case. To avoid damaging the meter's housing, never apply solvents to the meter.

If the meter requires cleaning, wipe it down with a cloth that is lightly dampened with water or a mild detergent. Do not use aromatic hydrocarbons, chlorinated solvents, or methanol-based fluids when wiping the meter.

9.4. Storing the Meter

If you are storing the Meter for an extended period of time, charge the LI-ION battery pack before storing. It is not necessary to remove the battery pack.

9.5. Calibration

The manufacturer may conduct the calibration and inspection. For more information, please contact the manufacturer.

9.6. Replacing and Disposing of the LI-ION Battery

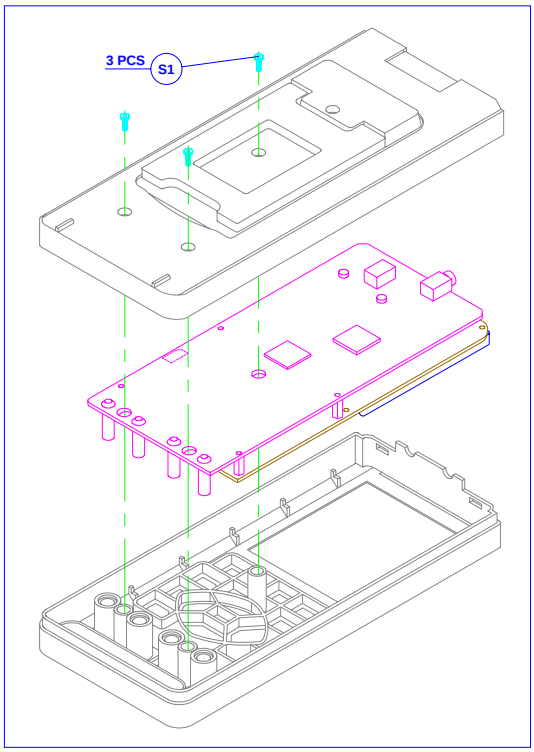
⚠ **Warning!**
To avoid electrical shock, remove the test leads and probes before replacing the battery pack.

⚠ **Caution**
Handle the PCB Assembly by its edges or while wearing gloves; avoid contaminating the PCB Assembly with oil from tour fingers.
A contaminated PCB Assembly may not cause immediate instrument failure in controlled environments. Failures typically show up when contaminated units are operated in humid areas.

Note
This instrument contains a LI-ION battery pack. Do not dispose of this battery pack with other solid waste. Used batteries should be disposed of by a qualified recycler or hazardous materials handler.

9.6.1. To replace the battery pack

1. Remove the Meter Case



Use the following procedure to remove the meter case.

① Release the test leads

Disconnect the test leads and probes both at the source and at the meter.

② Power OFF

Make sure the meter is turned off and unplugged from the power Adaptor.

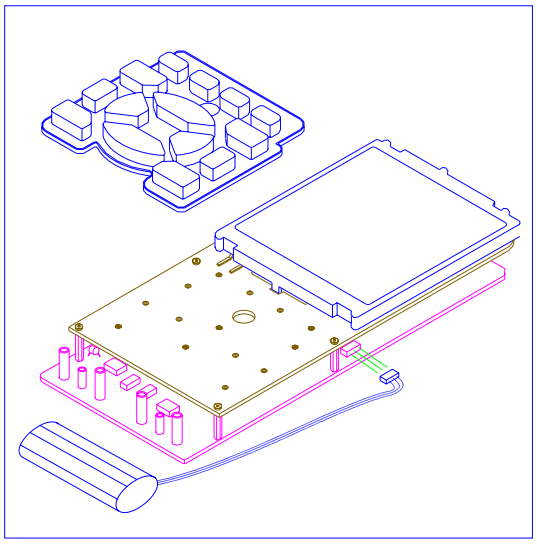
③ Remove Screw:

Remove the three screw from the bottom of the case. (3 pcs)

④ Remove the PCB Assembly:

Now remove the PCB Assembly by releasing the four snap retainers securing it to the case.

2. Remove Rubber key and Battery Pack



Rotate the PCB Assembly 180 degrees.

① Remove Rubber Key:

② Remove Battery Pack:

Remove the battery plug from the connector.

3. Install a new battery pack.

4. Reinstall the rear cover and secure the screws.

10. Appendices

10.1. Troubleshooting guide

If you experience a problem with the meter, try the corrective actions below before concluding that the instrument needs repair.

1. Make sure you are using a fresh LI-ION battery pack or fully charged rechargeable battery pack. If you are using the AC/DC power adapter, make sure the adapter is plugged into an appropriate live power source.

2. If the keys do not respond to your control or the contrast is set such that the display is unreadable, remove the power source while the instrument is on. Wait 15 minutes and then restore power and try operations.

3. If you still experience difficulty, check your connections and reread this instruction manual.

4. If the meter's display is frozen when trying to control the trigger level:

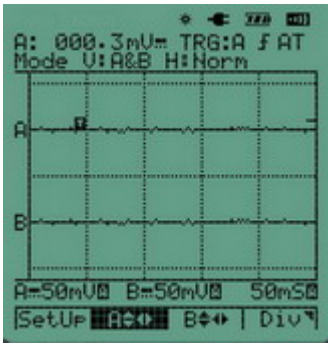
- In normal (NORM) mode, the trigger level must be the same level as the waveform. The Meter does not trigger if the trigger level is set above or below the waveform level.
- In AUTO (AT) mode, the trigger level does not have to be adjusted.
- In rare cases, the instrument may require servicing. There are no internal user-serviceable parts.

10.2. LCD STATUS BY FUNCTIONS

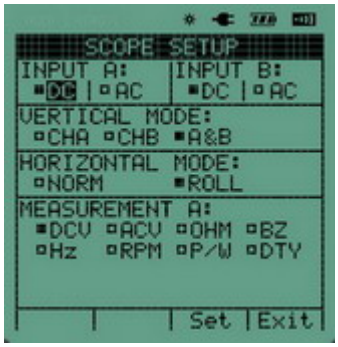
10.2.1. Function Menu & General Scope Mode

Function Menu & General Scope

FUNC



FUNC → ↕ → F3 (1)

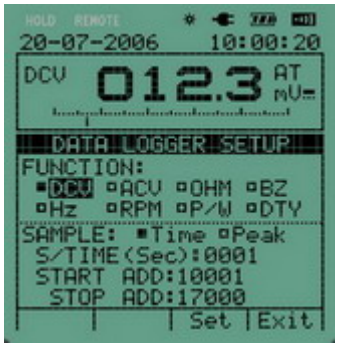


FUNC → ↕ → F3 → F1

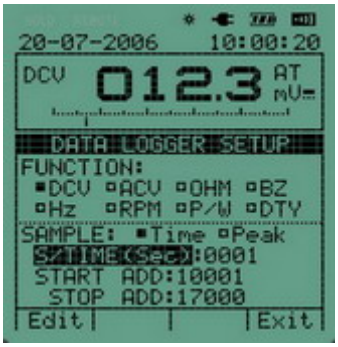
10.2.2. Data Logger Mode

Data Logger

FUNC → ↕ → F3 (2)



FUNC → ↕ → F3 → F1

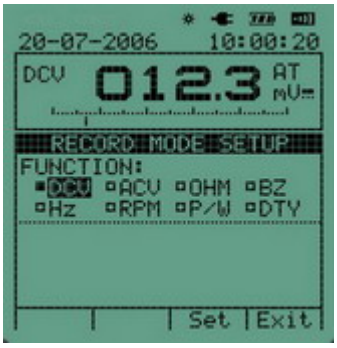


FUNC → ↕ → F3 → F1 → ↕

10.2.3. Multimeter / Record Mode

Record Mode

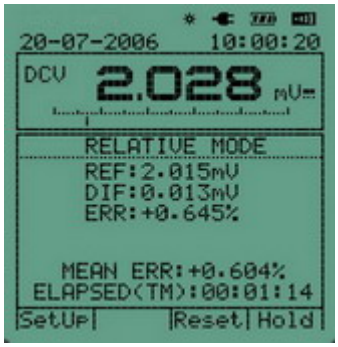
FUNC → ↕ → F3 (3)



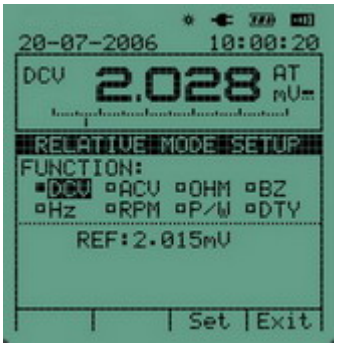
FUNC → ↕ → F3 → F1

10.2.4. Multimeter / Relative Mode

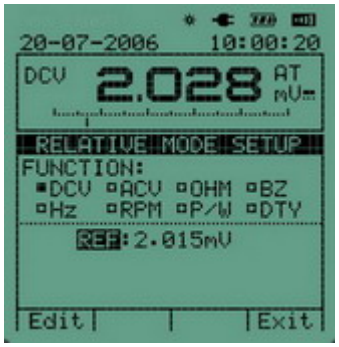
Relative Mode



FUNC → ↕ → F3 (4)



FUNC → ↕ → F3 → F1



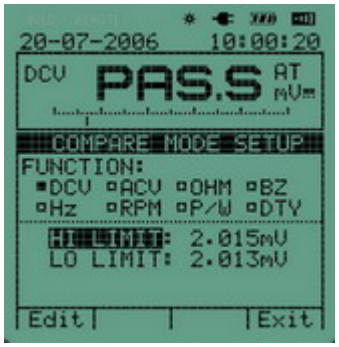
FUNC → ↕ → F3 → F1 → ↕

10.2.5. Multimeter / Compare Mode

Compare Mode

FUNC → ↕ → F3 (5)

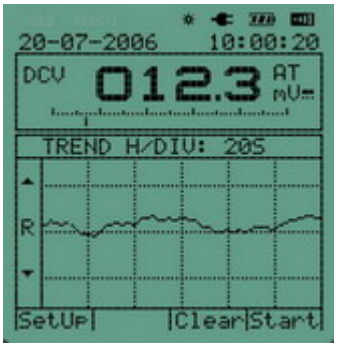
FUNC → ↕ → F3 → F1



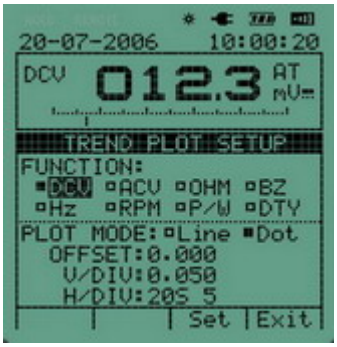
FUNC → ↕ → F3 → F1 → ↕

10.2.6. Multimeter / Trend Plot Mode

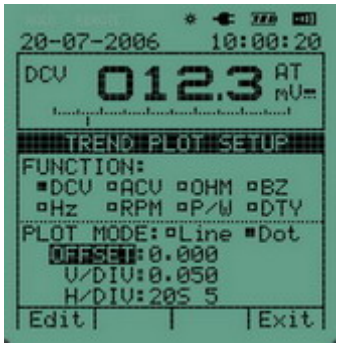
Trend Plot



FUNC → ↕ → F3 (6)



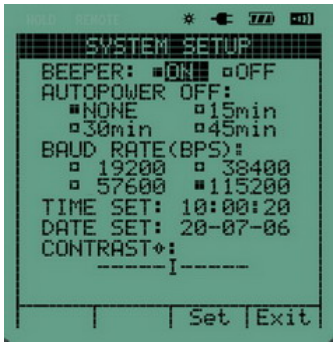
FUNC → ↕ → F3 → F1



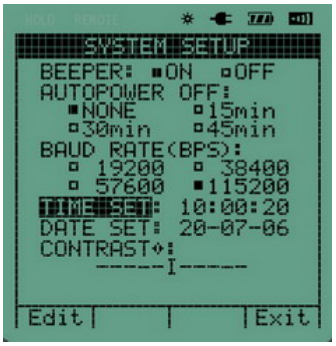
FUNC → ↕ → F3 → F1 → ↕

10.2.7. System Setup Mode

System Setup



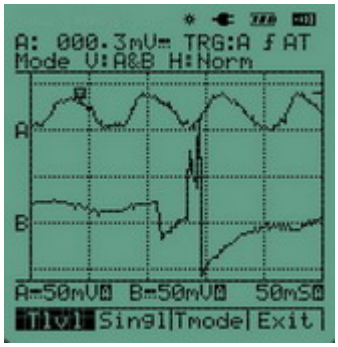
FUNC → ↕ → F3 (7)



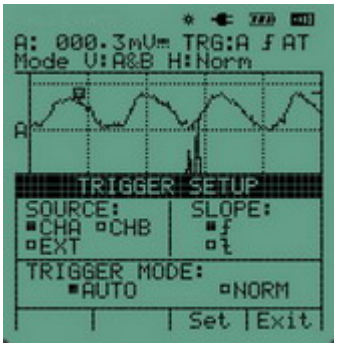
FUNC → ↕ → F3 → ↕

10.2.8. Trigger Setup Mode

Trigger Setup



FUNC → ↕ → F3 (1) → TRIG



FUNC → ↕ → F3 → TRIG → F3