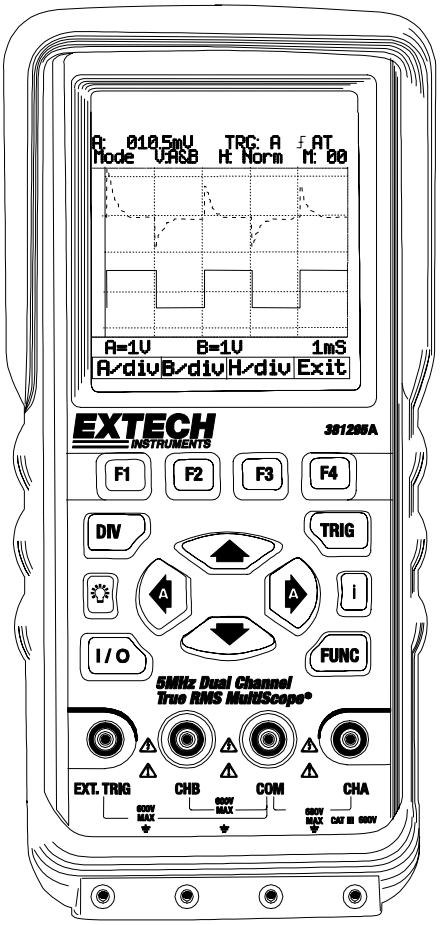
# User Manual

EXTECH INSTRUMENTS

# Model 381295A

## 5MHz Dual Channel
## True RMS Handheld Oscilloscope



## *Table of Contents*

## *Introduction*

### Main Features

- Rechargeable batteries and AC Adaptor:
  Model 381295A (120-240V, 50/60Hz)
- **USB** PC interface for viewing, saving, and printing measurement and waveform data.
- **Dual Channel** operation plus Auto Calibration features.
- **Automatic settings** for horizontal and vertical divisions.
- DC to **5MHz** bandwidth
- Built-in auto ranging **True-RMS** digital MultiMeter
- Auto ranging
- Data hold and run modes.
- Backlit display with Low battery indication.
- Display Type: Super-Twist 132 x 128 pixels.
- Designed to comply with safety standards: UL3111 and CSA C22.2 No.1010-1

## *Safety*

### Attention

Carefully read the following safety information before using this instrument.

### Safety Precautions

Specific warning and caution statements, where they apply, will be found throughout the manual.

A 'Caution' identifies conditions and actions that may damage the instrument. A 'Warning' identifies conditions and actions that pose hazard(s) to the user.

Symbols used on this instrument and in this manual are explained in the next table.

### ⚠ Warning

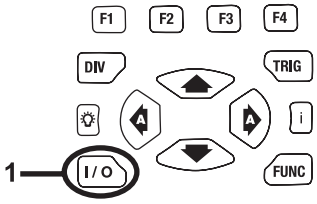
To avoid electrical shock, use only the supplied power supply.

| | |
|---|---|
|  | See explanation in manual |
|  | Dangerous Voltage |
|  | Double Insulation (Protection Class) |
|  | Earth (Ground) |
|  | Either AC or DC |
|  | DC – Direct Current |
|  | AC – Alternating Current |
|  | Fuse |

## *Quick-Start*

### Power On and Off

1.Pressing and holding this button for 2 to 3 seconds will turn the unit on. Pressing this button again will turn the power off.

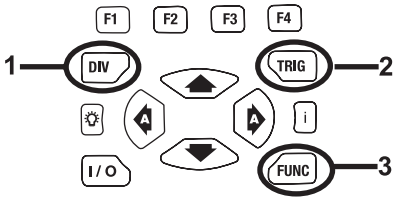



### Division, Trigger and Function key

**1 Division key:**
Adjusts vertical division or Horizontal division.

**2 Trigger key:**
Adjusts Trigger level.
Selects Single shot mode.
Selects trigger setup.

**3 Function key**:
Selects Scope Setup.
Selects general setup.



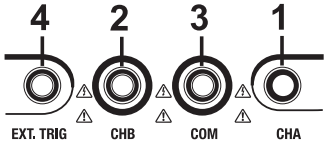

### Input Terminals

**1 Channel A**:
Always use the red channel A input for single input measurements.

**2 Channel B**:
For measuring two signals, use Channel B with Channel A.

**3 Common**:
Use the black common as signal ground for low frequency measurements and for ACV, DCV, Ohm, and Continuity measurements.

**4 External trigger**:
The EXT.TRIG input accepts external trigger signals.



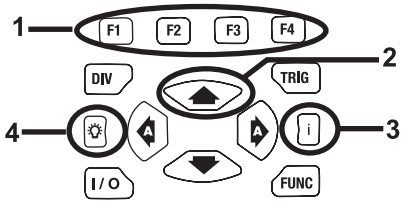

### Command (F1-F4), Arrow, Backlight and Help key

**1 Function Command keys**:
F1 through F4 are command 'soft' keys. Their functions change with each screen.

**2 Four arrow keys**:
These keys serve as the primary means of navigating the instrument's menus and operating displays.

**3 Help key**:
General information for the meter is available with a press of this key.

**4 Display back light**:
Press this button to turn on the backlight. To turn the back light off, press this button again.



## *Quick-Start*

**Primary Menu Map**

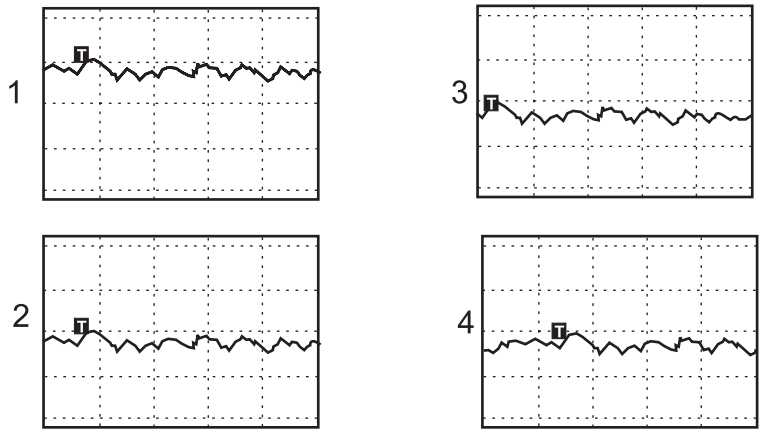

**Default Menu**


**Division Menu**


**Trigger Menu**


**Function Menu**

**Positioning the Waveform on the Screen**



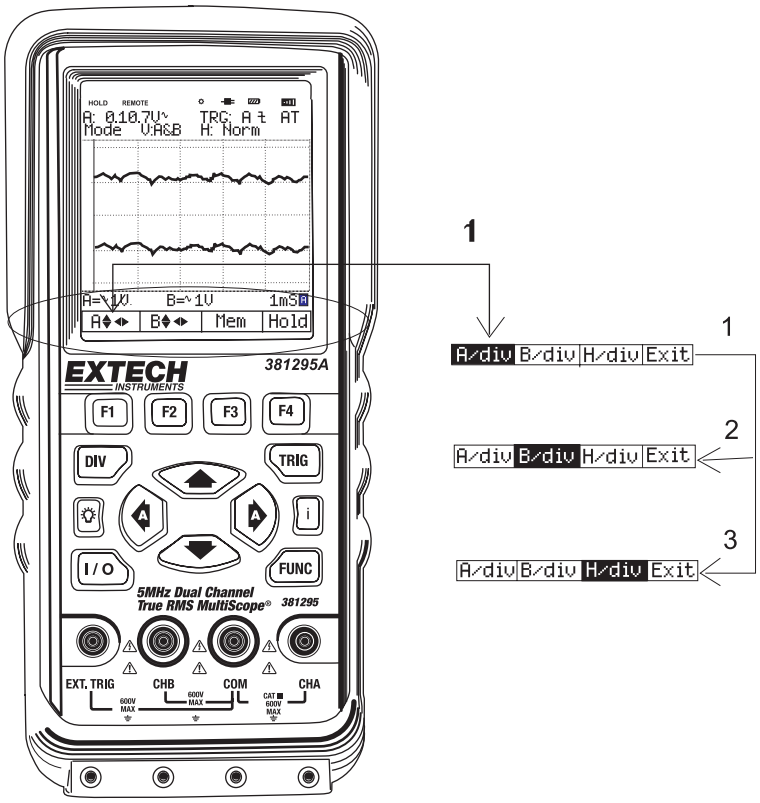

**1.** Pressing ▲ moves the waveform up.

**2.** Pressing ▼ moves the waveform down.

**3.** Pressing ◀ moves the waveform left.

**4.** Pressing ▶ moves the waveform right.

Division key map




**1** Pressing **DIV** calls up the default division menu.

**2** Press **F2** to control the Channel B Vertical Division.

**3** Press **F3** to change the Horizontal Division.

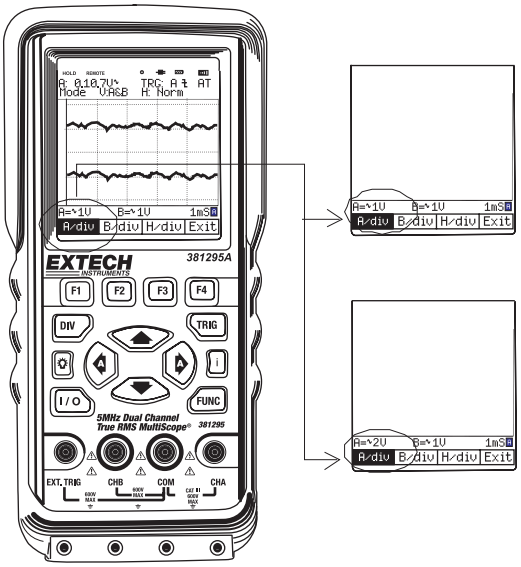
**4** Press **F4** to exit.

## Changing Vertical (A/div or B/div) division

**1** Pressing ▲ increases CHA vertical division (A/div).

**2** Pressing ▼ decreases CHA vertical division (A/div).

**3** Pressing ◀ or ▶ will change Div from MANUAL to AUTO(A).

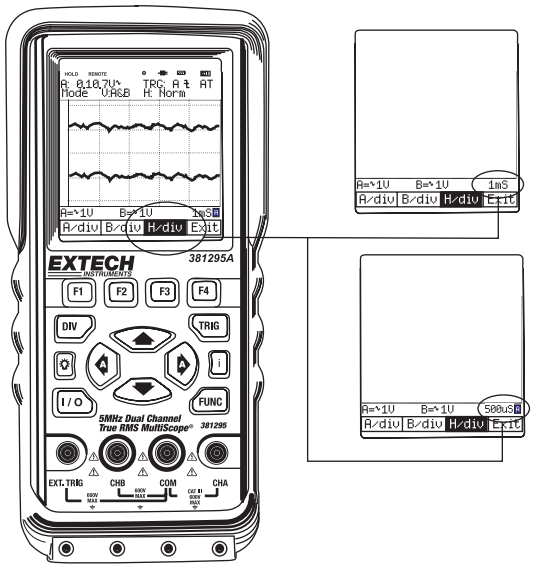



## Changing Horizontal division

**1** Pressing ▲ increases Horizontal division (H/div).

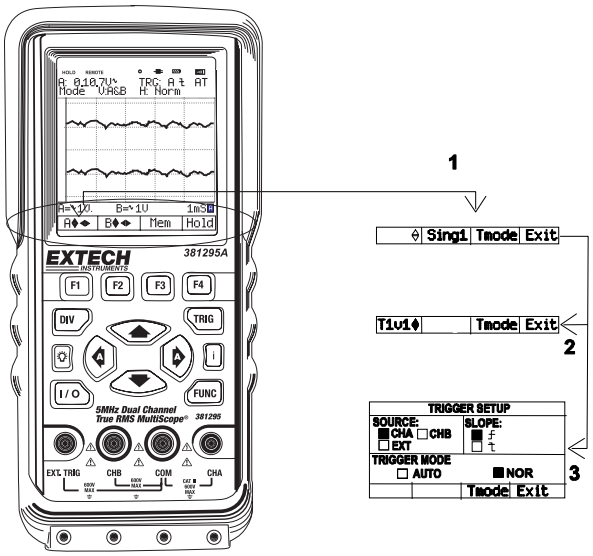
**2** Pressing ▼ decreases Horizontal division (H/div).

**3** Pressing ◀ or ▶ will change Div from MANUAL to AUTO(A).



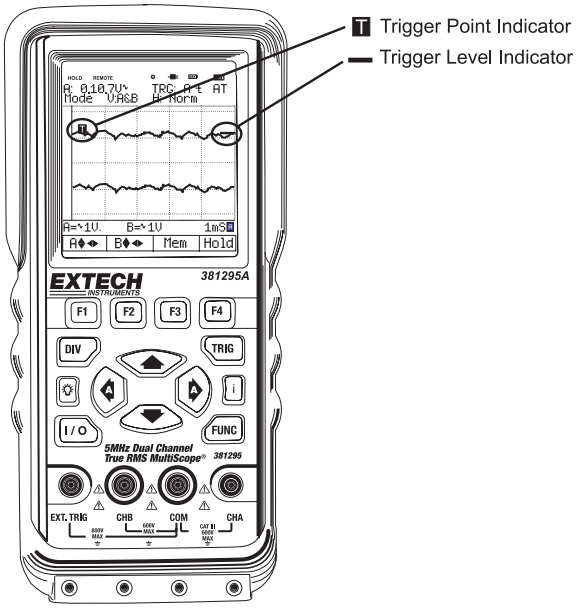
## Trigger key map

**1** Press **TRIG** to display the TRIGGER default menu.
**2** Press **F2** for Single shot mode.
**3** Press **F3** for TRIGGER SETUP.
**4** Press **F4** to exit.

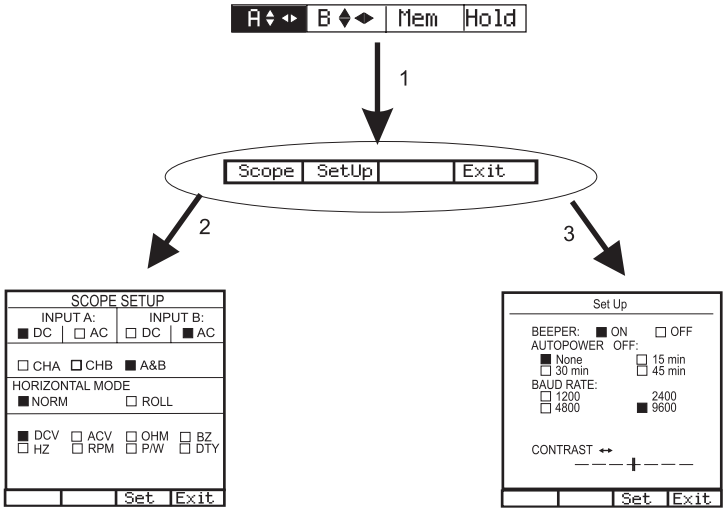



## Trigger level control

**1** Pressing ▲ increases the Trigger level.
**2** Pressing ▼ decreases the Trigger level.



## Function key map




**1** Press **FUNC** to display the FUNCtion default menu.
**2** Press **F1** for SCOPE SETUP.
**3** Press **F2** for General SETUP. Press **F4** to exit.

## *Specifications*

### 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 |
| MultiMeter 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. |
| AC Adaptor/Charger: | Class-2 transformer,<br>Input: 120-240V AC 50/60Hz<br>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. (460g) approx. |
| Safety | For indoor use and in accordance with the requirements for double insulation to IEC1010-1 (1995): EN61010-1 (1995) Overvoltage Category III 600V, Pollution Degree 2. |

## Oscilloscope Function

### Horizontal

| | |
|---|---|
| Sample Rate | 25 MS/s (Dual CH mode)<br>50 MS/s (Single CH mode) |
| Record Length | 512 single shot mode<br>256 in all modes |
| Sample / Division | 25 |
| 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% reading + 0.1 x range; (“0” reference at center scale) |
| Max. Input Volts | DC or AC 600Vrms |
| Volts / 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 Screen shots |

## Digital MultiMeter Function

The following specifications apply to the LCD readout in the upper left portion of the display, not the graphical display.

### DC V

| Scope V/Div | DMM Range | Resolution | Accuracy | Impedance |
|---|---|---|---|---|
| 50m, 0.1, 0.2 | 500mV | 0.1mV | ±(0.3%+3) | 1 MΩ |
| 0.5, 1, 2 | 5V | 0.001V | | |
| 5, 10, 20 | 50V | 0.01V | | |
| 50, 100, 200 | 500V | 0.1V | ±(0.5%+5) | |
| 500 | 1000V | 0.1V | | |

### AC V

| Scope V/Div | DMM Range | Resol. | Accuracy (Hz) | | | Imped. |
|---|---|---|---|---|---|---|
| | | | 50~450 | 0.45k~5k | 5k~20k | |
| 50m, 0.1, 0.2 | 300mV | 0.1mV | ±(0.75% +5) | ±(2%+5) | ±(3.5%+5) | 1 MΩ |
| 0.5, 1, 2 | 3V | 0.001V | | | | |
| 5, 10, 20 | 30V | 0.01V | | | | |
| 50, 100, 200 | 300V | 0.1V | | | | |
| 500 | 750V | 0.1V | | | N/A | |

### OHM

| Scope Div | DMM Range | Resolution | Accuracy | Over Load Protection |
|---|---|---|---|---|
| 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) | |

### Continuity Buzzer

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

## Frequency

| 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

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

## % Duty

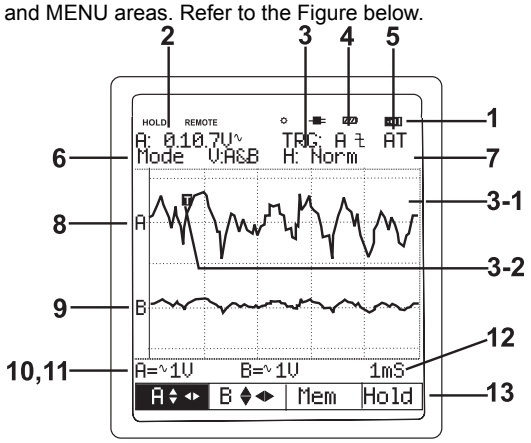
| Range |
|---|
| 25% - 75% |

## *Product Description*

In this section, the LCD, front panel buttons, controls and terminals are described.

### LCD Area

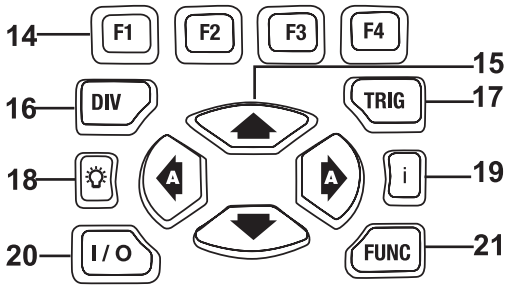
The screen is divided into five areas: INDICATOR, READING, WAVEFORM, SETTING and MENU areas. Refer to the Figure below.




**[LCD Display]**

1) Indicator
   - HOLD: Freezes displayed reading
   - REMOTE: USB PC interface indicator
   - BACKLIGHT( ): Backlight indicator
   - Charging LINE( ): Charging Battery indicator
   - BATTERY( ): Low battery indicator
   - BUZZER( ): Buzzer indicator
2) Primary Numerical Field (DMM Function): Displays numerical readings
3) Trigger selection: Channel A, B and External
   3-1) Trigger level indicator
   3-2) Trigger Cursor
4) Trigger Slope: Rising or Falling edge
5) Trigger mode: Normal or AUTO
6) Channel mode status
   Verticle mode: CHA, CHB, A&B
   Horizontal mode: Normal, Roll
7) Memory Address: 0 to 15
8) Live Scope Display (Channel A): Displays real time waveforms and freezes held captures.
9) Channel B
10) Channel A Vertical Division
11) Channel B Vertical Division
12) Horizontal Division (Time base)
13) Command Menu Field

## Keys Area




14) F1 F2 F3 F4 Command Menu keys
The F1 – F4 soft keys' functions change with each display screen.

| A/div | B/div | H/div | Exit |
|---|---|---|---|
| F1 | F2 | F3 | F4 |

15) Arrow keys: Use the arrow keys to highlight an item.
Press to move the cursor upward. This button also increases the value of a selection.
Press to move the cursor downward. This button also decreases the value of a selection.
Move the cursor to the left with this button.
Pressing this button changes Vertical division or horizontal division from MANUAL to AUTO.
Move the cursor to the right with this button.
Pressing this button changes Vertical division or horizontal division from MANUAL to AUTO.

16) **DIV** Division key: Set Channel A and B Horizontal Division

| A/div | B/div | H/div | Exit |
|---|---|---|---|
| F1 | F2 | F3 | F4 |

17) **TRIG** Trigger key: Set Trigger level, Single mode and Setup

| Tlvl ▲▼ | Singl | Tmode | Exit |
|---|---|---|---|
| **F1** | **F2** | **F3** | **F4** |

F3

| **TRIGGER SETUP** | | | |
|---|---|---|---|
| SOURCE:<br>■ CHA □ CHB<br>□ EXT | | SLOPE:<br>□  <br>■  | |
| TRIGGER MODE:<br>□ AUTO ■ NOR | | | |
| | | Set | Exit |
| **F1** | **F2** | **F3** | **F4** |

18)  Back Light Key: Activates Back Light for the LCD, Toggles backlight ON and OFF.

19) **i** Help key: Provides meter model number, firmware version, serial number, calibration date.

20) **I/O** Power switch: Turns the instrument ON or OFF (hold for 3 seconds to turn on)

21) **FUNC** Function Key: Set Scope, Auto Scope and Setup of the METER

| Scope | Setup | | Exit |
|---|---|---|---|
| **F1** | **F2** | **F3** | **F4** |

## Scope Setup

**FUNC➔F1 (Scope)**

| **SCOPE SETUP** | | | |
|---|---|---|---|
| INPUT A: | | INPUT B: | |
| ■ DC | □ AC | ■ DC | □ AC |
| VERTICAL MODE:<br>□ CHA □ CHB □ A&B | | | |
| HORIZONTAL MODE:<br>■ NORM □ ROLL | | | |
| MEASUREMENTS A:<br>■ DCV □ ACV □ OHM □ BZ<br>□ HZ □ RPM □ P/W □ DTY | | | |
| | | Set | Exit |
| **F1** | **F2** | **F3** | **F4** |

## *Terminal Area*


**Terminal Area**

22) Terminals description
The METER provides 4 input jacks.

CHA: Channel A
Use the red channel A terminal for all single input measurements.

COM: Common
Use the black COMMON terminal as signal ground for DCV, ACV, Ohm, Continuity, frequency and RPM measurements.

CHB: Channel B
When measuring two signals, use channel B and channel A.

EXT. TRIG
External trigger.

## *Operation*

**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 button for about 3 seconds.
4. The meter powers up configured as it was at last power down.

**Changing Backlight**

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

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

**Selecting items in a Menu**

Press **FUNC** to open the FUNCTION menu.

| Scope | SetUp | | Exit |
|---|---|---|---|
| **F1** | **F2** | **F3** | **F4** |

Press **F1** to open the **Scope Setup** menu.

| **SCOPE SETUP** | | | |
|---|---|---|---|
| INPUT A: | | INPUT B: | |
| ■ DC | □ AC | ■ DC | □ AC |
| VERTICAL MODE: □ CHA □ CHB ■ A&B | | | |
| HORIZONTAL MODE: ■ NORM □ ROLL | | | |
| MEASUREMENTS A: ■ DCV □ ACV □ OHM □ BZ □ HZ □ RPM □ P/W □ DTY | | | |
| | | Set | Exit |
| **F1** | **F2** | **F3** | **F4** |

Use the  arrow keys to highlight an item

Press **F3** to select an item

Press **F4** to Exit

Frequency measurement for CHA:

Plug the black test lead into the COM input jack and plug the red test lead into the CHA input jack

Press **FUNC** to open the FUNCTION menu.

| Scope | SetUp | | Exit |
|---|---|---|---|
| **F1** | **F2** | **F3** | **F4** |

Press **F1** to open the Scope Setup menu.

| **SCOPE SETUP** | | | |
|---|---|---|---|
| INPUT A: | | INPUT B: | |
| ■ DC | □ AC | ■ DC | □ AC |
| VERTICAL MODE: □ CHA □ CHB ■ A&B | | | |
| HORIZONTAL MODE: ■ NORM □ ROLL | | | |
| MEASUREMENTS A: ■ DCV □ ACV □ OHM □ BZ □ HZ □ RPM □ P/W □ DTY | | | |
| | | Set | Exit |

Press  to Highlight Hz (□ Hz )

**F3** Set
**F4** Exit

Observe that Hz is now the main reading.

## Holding (freezing) the display screen

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

Default (Command Menu) Display:

| A ▲▼ | B ▲▼ | Mem | Hold |
|---|---|---|---|
| **F1** | **F2** | **F3** | **F4** |

**F4** Freeze the screen. Highlighted Hold appears at the bottom of the Command Menu area.

**F4** Resume your measurement

## Changing the Graphic Representation

### Changing the vertical division

**DIV** Open the Command Menu.

| A/div | B/div | H/div | Exit |
|---|---|---|---|
| **F1** | **F2** | **F3** | **F4** |

**F1** or F**2** Change the vertical division. (CH A or CH B)

Increase the vertical division, Div is changed to manual mode

Decrease the vertical division, Div is changed to manual mode.

or Change Div from Manual mode to AUTO mode

### Changing the Time Base

**DIV** Open the Command Menu.

| A/div | B/div | H/div | Exit |
|---|---|---|---|
| **F1** | **F2** | **F3** | **F4** |

**F3** Change the Horizontal division**.**

| A/div | B/div | H/div | Exit |
|---|---|---|---|
| **F1** | **F2** | **F3** | **F4** |

Increase the number of periods.
Div is changed to manual mode

Decrease the number of periods.
Div is changed to manual mode

or Change Div from Manual mode to AUTO mode

## Acquiring the Waveform

**FUNC** Open the FUNCTION menu.

| Scope | SetUp | | Exit |
|---|---|---|---|
| **F1** | **F2** | **F3** | **F4** |

**F1** Open the Scope Setup menu.

| **SCOPE SETUP** | | | |
|---|---|---|---|
| INPUT A: | | INPUT B: | |
| ■ DC | □ AC | ■ DC | □ AC |
| VERTICAL MODE: □ CHA □ CHB ■ A&B | | | |
| HORIZONTAL MODE: ■ NORM □ ROLL | | | |
| MEASUREMENTS A: ■ DCV □ ACV □ OHM □ BZ □ HZ □ RPM □ P/W □ DTY | | | |
| | | Set | Exit |
| **F1** | **F2** | **F3** | **F4** |

**Recording Slow Signals over a Long Period of Time**

 Highlight ROLL MODE.

**F3** Set ROLL MODE.
**F4** Exit.
The roll mode function supplies a visual log of waveform activity and is especially useful when measuring lower frequency waveforms.

**Note:** ROLL MODE operates when the horizontal division is between 1s and 5s

**Selecting AC-Coupling for INPUT A**

 Highlight AC for INPUT A.

**F3** SET
**F4** Exit.

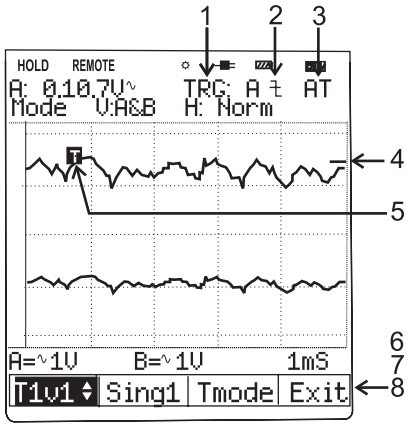
## Triggering on a Waveform

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

- Select a Channel
- Select rising or falling edge on which to trigger
- 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) Trigger Channel: Channel A or B
(2) Slope: rising or falling
(3) Trigger mode: Trigger setting mode (Auto or Normal)
(4) Trigger Level indicator
(5) Trigger Cursor
(6) Command Menu: Trigger level
(7) Command Menu: Single shot
(8) Command Menu: Trigger mode (Setup)




## Setting Trigger level (on NORmal trigger mode)

**TRIG** Open the Trigger menu

| Tlvl ▲▼ | Singl | Tmode | Exit |
|---|---|---|---|
| **F1** | **F2** | **F3** | **F4** |

▲▼ Adjust the Trigger Level continuously. Observe the horizontal trigger icon on the rightmost time division line.

**F4** Exit.

## 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.

**TRIG** Open the Trigger menu

| Tlvl ▲▼ | Singl | Tmode | Exit |
|---|---|---|---|
| **F1** | **F2** | **F3** | **F4** |

**F2** Highlight Singl (SINGLE SHOT)

| Tlvl ▲▼ | Singl | Tmode | Exit |
|---|---|---|---|
| **F1** | **F2** | **F3** | **F4** |

Meter performs a single shot. (One time screen update)

**F2** Return to normal Trigger mode.

## Setting Trigger mode (Tmode)

**TRIG** Open the Trigger menu

| Tlvl ▲▼ | Singl | Tmode | Exit |
|---|---|---|---|
| **F1** | **F2** | **F3** | **F4** |

**F3** Open the Trigger Setup

| TRIGGER SETUP | | | |
|---|---|---|---|
| SOURCE:<br>■ CHA □ CHB<br>□ EXT | | SLOPE:<br>□ ƒ<br>■ ƒ | |
| TRIGGER MODE:<br>□ AUTO ■ NOR | | | |
| | | Set | Exit |
| **F1** | **F2** | **F3** | **F4** |

 Highlight an ITEM.
**F3** Set the ITEM.
**F4** Exit.

## Setting AUTO Trigger Level

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

**F3** Open the Trigger Setup

| TRIGGER SETUP | | | |
|---|---|---|---|
| SOURCE:<br>■ CHA □ CHB<br>□ EXT | | SLOPE:<br>□  <br>■  | |
| TRIGGER MODE:<br>□ AUTO ■ NOR | | | |
| | | Set | Exit |
| **F1** | **F2** | **F3** | **F4** |

 Highlight AUTO.
**F3** Set AUTO.
**F4** Exit.

## Setting Normal Trigger mode

 Highlight NOR.
**F3** Set NOR.
**F4** Exit.

 Adjust the Trigger Level continuously. Observe the horizontal trigger icon on the rightmost time division line.

## Setting Trigger Slope

Highlight ƒ or ł.
**F3** Set ƒ or ł.
**F4** Exit.

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

## 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.

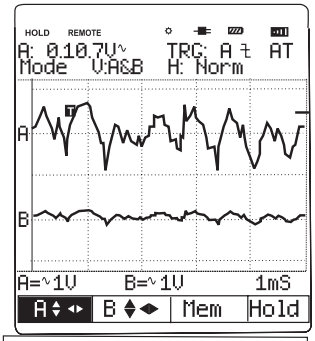
## Storing a Screen

**F3** Open the memory (Mem) menu

| Sto ▲▼ | Rcl ▲▼ | | Exit |
|---|---|---|---|
| **F1** | **F2** | **F3** | **F4** |

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.
**F1** Store the actual screen



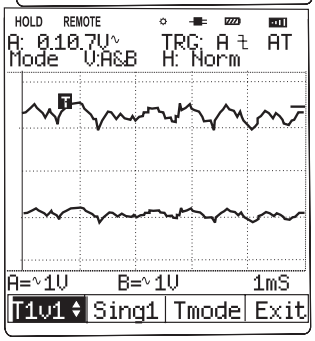

## Recalling Screen

**F3** Open the memory menu

| Sto ▲▼ | Rcl ▲▼ | | Exit |
|---|---|---|---|
| **F1** | **F2** | **F3** | **F4** |

Memory field (M:00) appears at the top-right corner of the display area.

▲▼ Select the memory address from which to recall the screen.
F2 Recall the screen.



## *PC Interface Software*

### Introduction

With the Meter connected to a PC, measurements can be viewed on the computer screen as they are taken. Graphical (scope) data can be viewed. The PC interface also allows the meter to be remotely controlled using the on-screen virtual push-buttons.

### Installing the HID Device

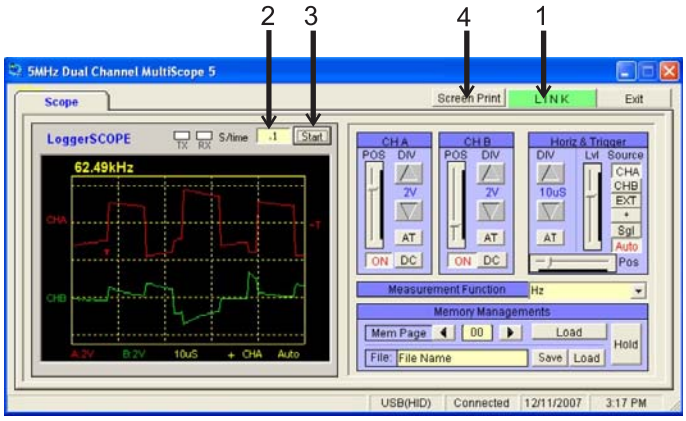
1. Connect the meter to the pc with the supplied cable by plugging the mini plug into the interface port on the top of the meter and the USB connector into a port on the pc.
2. Press the I/O key for 2 to 3 seconds to turn the unit on.
3. The Windows operating system displays "Found New Hardware" and automatically installs the Human Interface Device (HID) driver. HIDs do not require a custom USB driver. Support for HIDs is built into Windows.

### Application Software Installation

1. Insert the HandyScope software CD into the CD-ROM drive of your PC.
2. Auto Run or double click on the program Setup.exe.
3. Follow the on-screen instructions.

### Application Software Operation

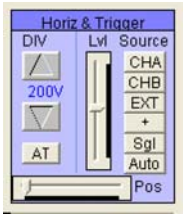
1. Connect the meter to the pc using the supplied cable..
2. Turn the meter on.
3. Click on the program icon to launch the program.
4. The opening window will appear.




5. Click on LINK (1) to begin communication.
6. Set the sampling rate (2) (0.001 to 9999).
7. Click START (3) to display the waveform.
8. Click SCREEN PRINT (4) to print the waveform.

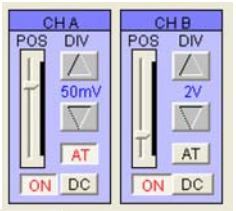
## Horizontal Sweep and Trigger Controls

| | |
|---|---|
| Source | Trigger source; Channel A, Channel B, External, + or- slope, Signal or Auto |
| Lvl | Trigger level |
| Div | ▲or▼time per division adjust, AT auto set |
| Pos | Trigger position |



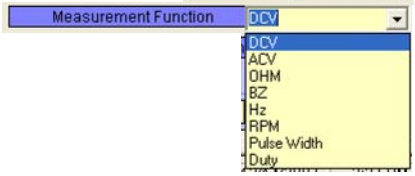

## Channel A and B controls

| | |
|---|---|
| Div | ▲or▼volts per division adjust, AT auto set |
| Pos | Verticle position |
| Coupling | ON/OFF, AC/DC |



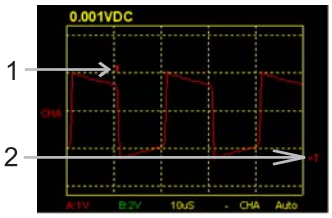

## Measurement Function

The pull down menu selects the measured function to be displayed on the screen.




## Display Area

1. Trigger point indicator (T)
2. Trigger level indicator (-T)




## Recall and Save stored screens

1. Click◄or►to select the memory page to recall.
2. Click “Load” to download the screen.
3. Type a file name and click “Save” to store the screen as a file on the pc.
4. Type a file name and click “Load” recall a stored file from the pc.

## *Maintaining the Meter*

### Cleaning the Meter

Clean the Meter with a damp cloth and a mild soap. Do not use abrasives, solvents, or alcohol.

### 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.

### Replacing and Disposing of the LI-ION Battery Pack

### Warning

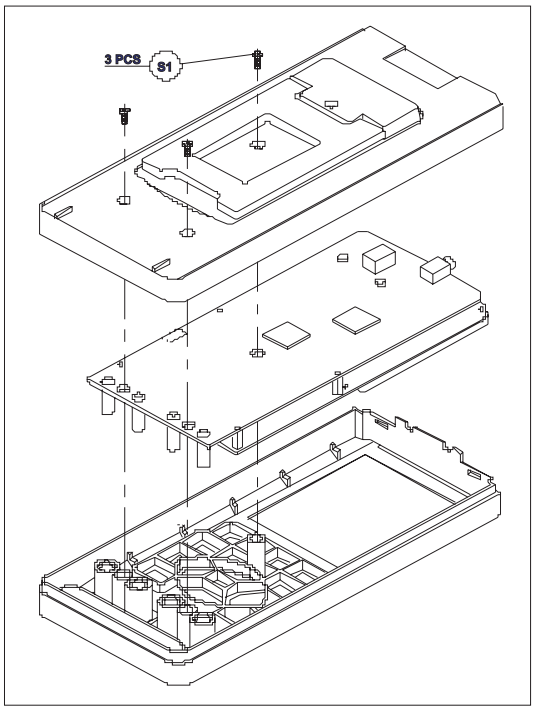
To avoid electrical shock, remove the test leads and probes before replacing the battery pack.

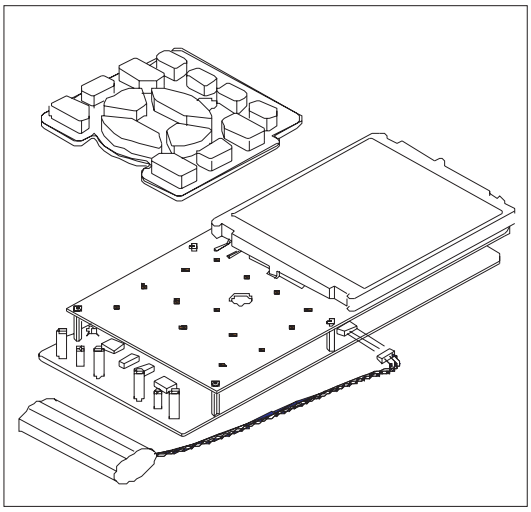
### Note

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.

To replace the battery pack:

1. Disconnect the test leads and probes both at the source and at the meter.
2. Loosen the screws with a screwdriver.
3. Lift the rear cover away from the Meter.
4. Take the battery pack out of the battery compartment.
5. Remove the battery plug from the connector.
6. Install a new battery pack.
7. Reinstall the rear cover and secure the screws.



Replacing the Battery

## 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 buttons do not respond 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 retry.

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 (NOR) 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.

## *Warranty, Repair, and Technical Support*

**Warranty**

**EXTECH INSTRUMENTS CORPORATION** warrants this instrument to be free of defects in parts and workmanship for **one year** from date of shipment (a six month limited warranty applies to sensors and cables). If it should become necessary to return the instrument for service during or beyond the warranty period, contact the Customer Service Department at (781) 890-7440 ext. 210 for authorization or visit our website *www.extech.com* for contact information. A Return Authorization (RA) number must be issued before any product is returned to Extech. The sender is responsible for shipping charges, freight, insurance and proper packaging to prevent damage in transit. This warranty does not apply to defects resulting from action of the user such as misuse, improper wiring, operation outside of specification, improper maintenance or repair, or unauthorized modification. Extech specifically disclaims any implied warranties or merchantability or fitness for a specific purpose and will not be liable for any direct, indirect, incidental or consequential damages. Extech's total liability is limited to repair or replacement of the product. The warranty set forth above is inclusive and no other warranty, whether written or oral, is expressed or implied.

**Calibration and Repair Services**

Extech offers repair and calibration services for the products we sell. Extech also provides NIST certification for most products. Call the Customer Service Department for information on calibration services available for this product. Extech recommends that annual calibrations be performed to verify meter performance and accuracy.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Product specifications subject to change without notice
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