



Owner's Manual

English / Español

Model 381270 & 381275 MultiScope™



CAUTION: Read, understand and follow all Safety Rules and Operating Instructions in this manual before using this product.

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WARNING: USE EXTREME CAUTION IN THE USE OF THIS DEVICE. Improper use of this device can result in injury or death. Follow all safeguards suggested in this manual. In addition to the normal safety precautions used in working with electrical circuits. DO NOT service this device, if you are not qualified to do so.

SAFETY INSTRUCTIONS

This meter has been designed to be safe in use, but the operator must use caution in its operation. The rules listed below should be carefully followed for safe operation.

- Avoid Working Alone.
- Do not use Non-Rechargeable Batteries (Alkaline, Carbon Zinc etc.) together with the AC power Adapter.
- Do not turn the Rotary switch to HI-Z/ range while the Test Leads are connected to a High Voltage
- When measuring resistance (OHMS) be sure the circuit is non-powered. Ohms can not be measured if there is voltage in the circuit being measured.
- When using the inductive pick up lead, be sure you keep the inductive clamp away from adjoining high tension spark plugs leads to prevent the clamp from picking up signals from those leads.
- Use a current clamp to measure circuits exceeding 20A.
- When measuring current, turn the power off before connecting the meter to the circuit.
- Select the proper function and range for your measurement.
- Never connect more than one set of test leads to the meter.
- Disconnect the live test lead before disconnecting the common test lead.
- Choose the proper range and function for the measurement.
- Do not try voltage or current measurements that may exceed the ratings marked on the function/range switch or terminal.
- Avoid Electrical Shock. Do not touch the test leads tips or the circuit being tested.
- Never operate the meter unless the back cover and the battery/fuse door are in place and fastened securely

SAFETY SYMBOLS



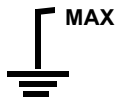
This symbol adjacent to another symbol, terminal or operating device indicates that the operator must refer to an explanation in the Operating Instructions to avoid personal injury or damage to the meter.



This **WARNING** symbol indicates a potentially hazardous situation, which if not avoided, could result in death or serious injury.



This **CAUTION** symbol indicates a potentially hazardous situation, which if not avoided, may result in minor or moderate injury, or damage to the product or other property.



This symbol advises the user that the terminal(s) so marked must not be connected to a circuit point at which the voltage, with respect to earth ground, exceeds (in this case) 500 VAC or VDC.



This symbol adjacent to one or more terminals identifies them as being associated with ranges that may, in normal use, be subjected to particularly hazardous voltages. For maximum safety, the test leads should not be handled when these terminals are energized.

SPECIFICATIONS

| | |
|----------------------|---|
| Display | 128x64 pixel graphic LCD (view area: 2.8x1.5", 71.7x39mm) |
| Measurement rate | Digital: 4 times/sec. Bar-Graph: 7 times/sec. |
| Auto Power Off | After 30 minutes of inactivity |
| Overrange indication | "OVER" |
| Display rate | Digital display; 4/second Bargraph; 7/second |
| Input resistance | 10M Ω , >2G Ω on mV range |
| Power | 6 size AA cells, 6 size AA Nicad batteries, 2 Ni-Cad Battery Pack or AC adaptor Operating time: Alkaline (6hrs approx.), Ni-Cad (8hrs approx.) Ni-Cad Charging time (3hrs approx.) |
| Temperature | Operating: 32°F to 104°F(0°C to 40°C), Storage (Ni-Cad batteries removed): -4°F to 140°F (-20°C to 60°C), Charging: 32°F to 113°F(0°C to 45°C) |
| RS232 Interface | Baud Rate: 9600, Data bit: 8 bit, Stop bit: 1 bit, Parity: none |
| Min/Max/Avg. | Records minimum, average and maximum value |
| Hold | Captures displayed reading. |
| Storage | 15 pages (text or graphic) |
| Dimensions/weight | 4.2x8.3x2.2" (107x210x55mm) / 1.77lbs. (800gm) |

| Digital Storage Oscilloscope | | |
|------------------------------|---------------------------------|---------------------|
| Display | Number of Channels | One |
| | Bandwidth | DC to 100kHz |
| | Volt / Division (4 divisions) | 150mV to 400V |
| | Sample Rate | 1.0MSPS |
| Horizontal | Number of Channels | One |
| | Second / Division (9 divisions) | 10usec. to 1 second |
| | Record length | 25 div |
| Glitch Capture | 500nsec. (minimum) | |

| Multimeter | Range | Resolution | Accuracy |
|---------------------|-------|------------|--|
| DC Voltage | 400mV | 0.1mV | $\pm(0.5\%\text{rdg} + 10\text{dgt})$ |
| | 4V | 0.001V | |
| | 40V | 0.01V | |
| | 400V | 0.1V | |
| | 1000V | 1V | |
| AC Voltage True RMS | 400mV | 0.1mV | $\pm(0.75\%\text{rdg} + 10\text{dgt})$ RMS 50Hz to 1kHz |
| | 4V | 0.001V | |
| | 40V | 0.01V | |
| | 400V | 0.1V | |
| | 700V | 1V | |

| | | | |
|------------|-------|---------|--|
| DC Current | 400uA | 0.001mA | $\pm(1.0\%rdg + 10dgt)$ |
| | 400mA | 0.1mA | |
| | 20A | 0.01A | |
| AC Current | 4mA | 1uA | $\pm(1.2\%rdg + 10dgt)$ RMS 50Hz to 10kHz |
| | 400mA | 0.1mA | |
| | 20A | 0.01A | |

| Multimeter | Range | Resolution | Accuracy |
|--------------------|----------------|---|---------------------------------|
| Resistance | 400 Ω | 0.1 Ω | $\pm(1.0\%rdg + 5dgt)$ |
| | 4k Ω | 0.001k Ω | |
| | 40k Ω | 0.01k Ω | |
| | 400k Ω | 0.1k Ω | |
| | 4M Ω | 0.001M Ω | |
| | 40Mohms | 10kohms | $\pm(3.0\%rdg + 5dgt)$ |
| Conductance | 0025 to 0999nS | 1nS | $\pm(3.0\%rdg + 5dgt)$ |
| Capacitance | 4nF | 0.001nF | $\pm(3.0\%rdg + 5dgt)$ |
| | 40nF | 0.01nF | |
| | 400nF | 0.1nF | |
| | 4uF | 0.001uF | |
| | 40uF | 0.01uF | |
| Frequency | 1,000Hz | 1Hz | $\pm(1.0\%rdg + 5dgt)$ |
| | 100kHz | 1kHz | |
| Diode Test | | 1mV | $\pm(2.0\%rdg + 5dgt)$ |
| dB | -80 to +80dB | Reference values: 2, 4, 8, 16, 50, 75, 93, 110, 125, 135, 150, 300, 600, 900, 1000 Ω | |
| RPM | 12000rpm | 10rpm | $\pm(3.0\%rdg + 10rpm)$ |
| Period/Pulse Width | 4000usec | 1usec | $\pm(3.0\%rdg + 5dgt)$ |
| | 1000msec | 1msec | |
| Duty Cycle | 1 to 100% | 0.1% | $\pm(3.0\%rdg + 5dgt)$ |
| Signal Out | 10Hz – 100Hz | 1Hz | $\pm(1.2\% + 5 \text{ digits})$ |
| | 100Hz - 1000Hz | 10Hz | |
| | 1kHz – 20kHz | 1kHz | |

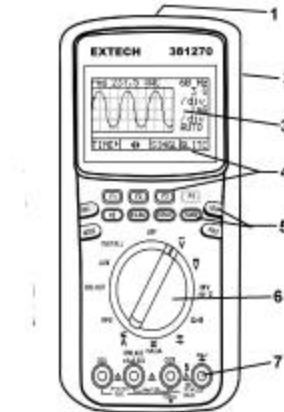
OVERLOAD PROTECTION

| Input Overload Protection | |
|---------------------------|---|
| Function | Maximum Input |
| V DC, V AC | 1000V DC or AC peak, less than 10 sec |
| mV AC, mV DC | 250V DC or AC peak, less than 10 sec |
| mA DC/AC | 400mA DC / AC, Fused: 0.4A/250V ceramic fast blow |
| 20A DC/AC | 20A DC or AC, less than 30 sec with a 15 min cool |

| | |
|--|--|
| | down period, Fused: 20A/250V ceramic fast blow |
| RPM | 250V Dc or AC rms, less than 10 sec |
| Period/Pulse Width | 250V DC or AC rms, less than 10 sec |
| Duty Cycle | 250V DC or AC rms , less than 10 sec |
| Capacitance | None |
| Diode | None |
| WARNING: To avoid electric shock and damage to the meter, do not test any diode or capacitor that has voltage on it | |

BASIC METER FUNCTIONS

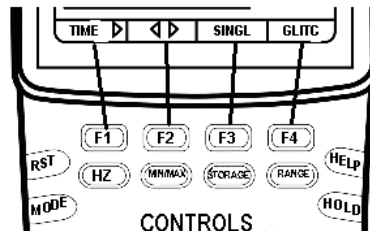
1. RS 232 Computer Interface Socket
2. AC Adapter Input Socket
3. LCD Screen display
4. Soft keys and labels
5. Buttons (Select mode of operation)
6. Rotary Switch (Select function).
7. Input jacks



CONTROLS

Soft function keys F1, F2, F3, F4

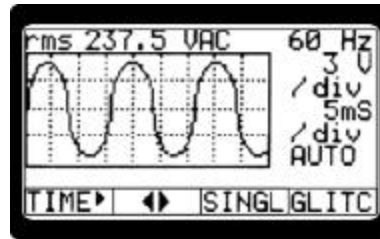
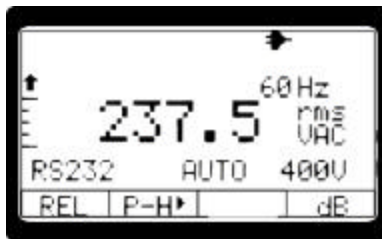
These four keys perform the function indicated on the LCD display. The function will change depending on the position of the rotary switch and the mode of operation.



- RST:** Power reset key to re-activate power if the auto-shutoff is in effect after 30 minutes of inactivity.
- MODE:** Toggle between the multimeter text mode and the oscilloscope graphics mode. The graphics mode functions in the V, A, and mV modes.
- HOLD:** “Freezes” the reading on the display. Press “Hold” again to resume normal operation. The hold symbol “H” will appear on the display when Hold is selected.
- HELP:** Displays three screens (safety, connections, procedure) for the function selected on the rotary switch. The F4 key steps through the pages. Press “HELP” to exit.
- HZ:** Selects the Frequency mode in V functions.
- MIN/MAX:** Selects the MIN, MAX, Average display.

STORAGE: Store and recall measurement data or graphical display.



RANGE: Holds and selects a measurement range. Hold the key for 2 seconds to return to auto-range.









BASIC DISPLAYS

Multimeter Mode

DISPLAY SYMBOLS

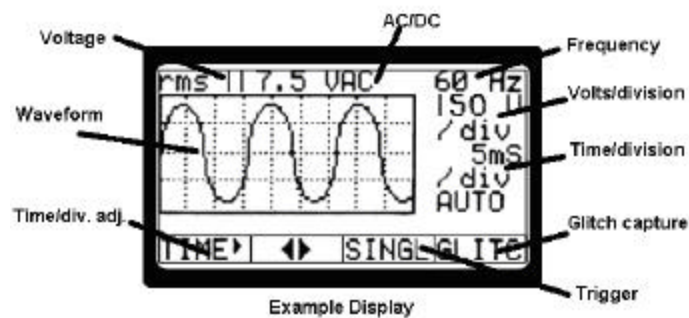
| | |
|--|----------------------------|
| A | Ampere |
| AC  | Alternating current |
| AUTO | auto ranging |
| Ave | average |
| BEEPER | Button beeper |
| CALL | Recall stored data |
| CLEAR | Remove stored data |
| dB | Decibel |
| DC  | Direct current |
| div | division (graph mode) |
| DUTY | Duty cycle |
| F | Farads (capacitance) |
| Glitch | Glitch Waveform |
| Hi-A | High Current |
| Hi-Z | High Impedance |
| Hz | Hertz (frequency) |
| Max | maximum |
| Min | minimum |
| nS | Nano Siemens (Conductance) |
| °C | Degrees Centigrade |
| °F | Degrees Fahrenheit |
| OUT | Signal out |
| PAUSE | Pause in "MIN/MAX" mode |
| P-H | Peak Hold |

Oscilloscope Mode

| | |
|--|------------------------------|
| Psi,kPa | Pressure |
| RANGE | manual ranging |
| REL | Relative |
| RESET | Reset |
| RMS | True RMS |
| RPM | revolution per minute |
| RS232 | RS 232 Interface is on |
| RUN | Record in "MIN/MAX" mode |
| Singl | Single Waveform |
| SLEEP | Auto shut-off |
| TEST | Self Test (Install function) |
| Time  | Time change (graph mode) |
| TRIG | Frequency Trigger |
| V | Volts |
| Ω | ohms (resistance) |
| %RH | Relative Humidity |
| 2 cyl | 2 cycle engine |
| 4 cyl | 4 cycle engine |
|  | Buzzer, Continuity |
|  | cursor (left or right) |
| %& | cursor (up or down) |
|  | Low Battery Indication |
|  | Overrange on A & V ranges. |
|  | AC adaptor is connected |

GRAPHICAL DISPLAY DESCRIPTION

1. The graphical mode is entered when the **"MODE"** key is pressed when the function switch is in the ACV, DCV, mV, ACA or DCA position
2. The amplitude (vertical) and time (horizontal) divisions are selected automatically when in the autoranging mode. The time division will vary to display the best wave pattern in the autoranging mode or can be set manually using the **"F1"** and arrow keys. The volts/division is determined by the range selected and cannot be varied.



SOFT KEYS AND SUB-MENUS

Function keys **F1**, **F2**, **F3**, and **F4** are located directly below the LCD display and perform multiple operation as indicated on the LCD and determined by the function selected by the rotary switch. Some functions will produce a sub-menu on the display for further selection. Operation of the menus and sub-menus is described in the appropriate operation paragraph.

OPERATING INSTRUCTIONS

WARNING: Risk of Electrocution. High-voltage circuits, both AC and DC, are very dangerous and should be measured with great care.

1. **ALWAYS** set the power switch to the **OFF** position when the meter is not in use.
2. If **"OVER"** appears in the display during a measurement in the manual range mode, the value you are measuring exceeds the range you have selected. Change to a higher range.

AUTORANGE / MANUAL RANGE SELECTION

The meter will turn on in the autoranging mode. For most applications this is the easiest and most accurate method of measurement. For measurements that require the range to be held:

1. Press the **"RANGE"** key. The display will change from **"AUTO"** to **"RANGE"** (manual range) with the full scale value displayed.
2. Each time the **"RANGE"** key is pressed, the next available range will be set.
3. To return to **"AUTO"** range, hold the **"RANGE"** key for 4 seconds.

DATA HOLD

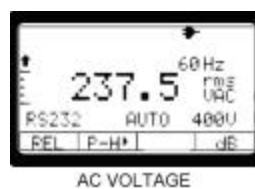
The meter will freeze the reading in the display when the **HOLD** key is pressed. **"H"** will appear in the display when **HOLD** is activated. Press **HOLD** again to resume normal operation.

AUTO POWER OFF

The meter will automatically shut off after 30 minutes if a push button is not pressed or the rotary switch is not moved. The symbol in the upper left of the display indicates the time left to shut off.

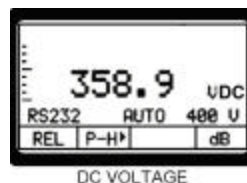
AC VOLTAGE MEASUREMENT

1. Turn the rotary switch to the **ACV** position.
2. Press the **HELP** key and then the **F4** key to display procedures, cautions and connection diagrams regarding ACV measurements.
3. Press the **HELP** key again to exit the HELP screens.



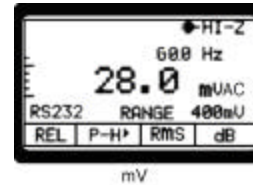
DC VOLTAGE MEASUREMENT

1. Turn the rotary switch to the **DCV** position.
2. Press the **HELP** key and then the **F4** key to display procedures, cautions and connection diagrams regarding DCV measurements.
3. Press the **HELP** key again to exit the HELP screens



mV HI-Z AC AND DC VOLTAGE MEASUREMENTS

1. Turn the rotary switch to the **mV/HI-Z**.
2. Press **F3** to toggle between AC and DC measurement.
3. Press the **HELP** key and then the **F4** key to display procedures, cautions and connection diagrams regarding DCV measurements
4. Press the **HELP** key again to exit the HELP screens



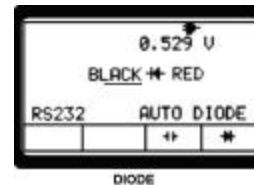
RESISTANCE, CONDUCTANCE AND CONTINUITY MEASUREMENTS.

1. Turn the rotary switch to the **Ω** position.
2. The meter will turn on in the resistance autoranging mode.
3. Press the **HELP** key and then the **F4** key to display procedures, cautions and connection diagrams regarding resistance measurements
4. Press **F2** to activate the continuity beeper. The meter will beep if the resistance measurement is less than 40Ω.
5. Press **F3** to enter the conductance (nS) mode. Conductance = 1/Ω and is displayed in nS (nano Siemens) from 0025nS to 0999nS (1 to 40MΩ)



CAPACITANCE AND DIODE MEASUREMENTS.

1. Turn the rotary switch to the **DIODE** position.
2. Press the **HELP** key and then the **F4** key to display procedures, cautions and connection diagrams regarding diode or capacitance measurements
3. The meter will turn on in the capacitance autoranging mode.
4. Press **F4** to enter the diode mode.
5. In diode check, the meter will display a diode symbol and indicate the forward voltage drop across the diode



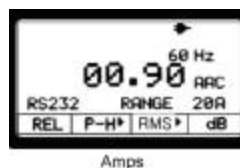
mA / μA AC AND DC CURRENT MEASUREMENTS.

1. Turn the rotary switch to the **mA/μA** position.
2. Press the **HELP** key and then the **F4** key to display procedures, cautions and connection diagrams regarding current measurements
3. The meter will turn on in the DC μA mode.
4. Press **F4** to change to AC measurements.
5. Press **F3** to change to the mA mode.



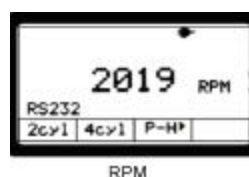
AC AND DC CURRENT MEASUREMENTS.

1. Turn the rotary switch to the **AC/DC A** position.
2. Press the **HELP** key and then the "**F4**" key to display procedures, cautions and connection diagrams regarding current measurements
3. Maximum allowed current is 20 Amps. Use a current clamp for larger currents.
4. Press F3 to change from DC to AC current.
5. Press F4 to change to dB.



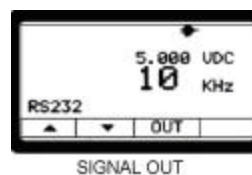
RPM MEASUREMENTS.

1. Turn the rotary switch to the RPM position.
2. Press the **HELP** key and then the "**F4**" key to display procedures, cautions and connection diagrams regarding rpm measurements
3. Connect the optional inductive pickup as described.
4. Press F1 for 2 cycle engines and F2 for 4 cycle engines..



SIG.OUT

1. Turn the rotary switch to the SIG.OUT position.
2. Press the **HELP** key and then the "**F4**" key to display procedures, cautions and connection diagrams regarding the SIG.OUT function.
3. Press F1 to increase the frequency and F2 to decrease the frequency.
4. Press F3 to initiate the output. Press again to disable the output.



AUX

The AUX selection allows direct display of °C, °F, %RH, psi or High current in the correct units when the meter is used with an optional adaptor.

1. Turn the rotary switch to the AUX position.
2. Press the **HELP** key and then the **F4** key to display procedures, cautions and connection diagrams regarding the AUX function.
3. Press F1 to F4 to select the units that match the adaptor being used

INSTALL

The Install function provides a means to set three default Power-on conditions (dB reference, key beeper, auto-shutoff) and also enable self-test.

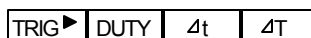
1. Turn the rotary switch to the **INSTALL** position.
2. Press the F1 key to select one of the three features.
3. Press F2 to enable or disable the feature or to set the dB reference level.
4. Press F3 to save the changes.



5. Press F4 to run the self test.

HZ FREQUENCY MEASUREMENTS

1. Press the **HZ** key in the ACV, DCV, mV, or Amp function to change to the frequency display. The frequency related soft keys will appear on the display.
2. Frequency display soft-keys

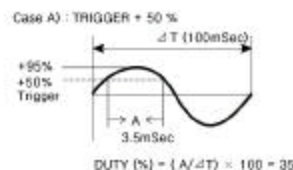


F1 "TRIG" trigger level

- a) The Trigger Level allows adjustment of the trigger level from 0 to 95% of the peak of the measured signal.
- b) Press **F1** to change the polarity of the trigger.
- c) Press **F2** or **F3** to adjust the % trigger level
- d) Press **F4** to exit the trigger level menu.

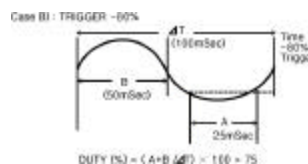
F2 "DUTY" duty ratio

- a) The Duty function changes the display from frequency to duty ratio.
- b) Press **F2** to enter the duty function. The display will change to % if a signal is present.
- c) In the duty function, "**DUTY**" will blink.
- d) Press **F2** to exit the mode.



F3 "Δt" pulsewidth

- a) The pulse width function changes the display from frequency to pulse width.
- b) Press **F3** to enter the pulse width function. The display will change to mS if a signal is present.
- c) In the pulse width function, "**Δt**" will blink.
- d) Press **F3** to exit the mode.

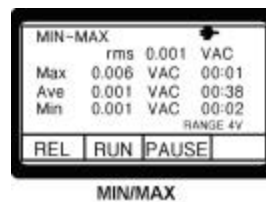


F4 "ΔT" period

- a) The period function changes the display from frequency to period.
- b) Press **F4** to enter the period function. The display will change to mS if a signal is present.
- c) In the period function, "**ΔT**" will blink.
- d) Press **F4** to exit the mode.

MIN/MAX DISPLAY

1. Press the "**MIN/MAX**" key to enter this function.
2. The display will indicate the maximum value, the average value, and the minimum value since the mode was initiated and the relative time for each value is displayed next to the value.
3. The time format is MIN:SEC (00:00).
4. Press **F1** to reset the time and begin recording a new series.
5. Press **F3** to pause the recording.
6. Press **F2** to resume recording after **F3** is pressed.



STORAGE FUNCTIONS.

1. Press the **STORAGE** key to enter this feature.
2. The display will list four memory locations and indicate what type of data is stored in each location. Locations with no data will be left blank.
3. Press **F1** to scroll the diamond cursor down through the 15 memory locations.
4. At the selected memory location, press **F2** to store the last text or graphical display or press **F3** to RECALL the stored data.
5. At the selected memory location, press **F4** to clear the memory.
6. Press **STORAGE** to exit the feature.

RANGE

The meter will turn on in the autoranging mode. For most applications this is the easiest and most accurate method of measurement. For measurements that require the range to be held:

1. Press the **RANGE** key. The display will change from "**AUTO**" to "**RANGE**" (manual range) with the full scale value displayed.
2. Each time the **RANGE** key is pressed, the next available range will be set.
3. To return to "**AUTO**" range, hold the **RANGE** key for 4 seconds.

RELATIVE (text soft key)

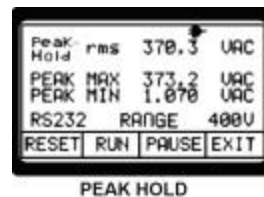
The relative mode displays of the difference between a reference value and the measured value

| | | | |
|-----|-----|--|--|
| REL | P-H | | |
|-----|-----|--|--|

1. Press the **F1** soft key when the measured reference value is on the display.
2. The "**REL**" label will blink when the relative mode is active.
3. Press **F1** to exit relative mode.

PEAK-HOLD (text soft key)

1. Press the **P-H** soft key.
2. The LCD will display the Peak rms value of the measured parameter, the peak max and peak min values.
3. Press **F3 PAUSE** to hold the min and max values.
4. Press **F2 RUN** to continue measuring.
5. Press **F1 RESET** to reset the values for a new run.
6. Press **F4** to **EXIT**.



DB (text soft key)

1. Press **F4 "dB"** to display dB. This feature is available in the voltage, millivolt and amp functions.
2. The reference impedance is set in the install function.

TIME (graphical soft key)

The TIME function is used to adjust the horizontal display rate in time/division.

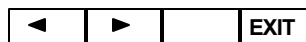
1. Press **F1 "TIME"**
2. Press the **F1** or **F2** up/down arrow keys to adjust the time.

3. Press **F4** "**EXIT**" to return to auto-time.

◀▶ (graphical soft key)

The **F2** left/right arrow key will “freeze” the waveform on the display and open a sub- menu which allows time scrolling.

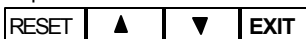
1. Press **F2** to freeze the graphical display.
2. Press the sub-menu **F1** or **F2** arrow keys to shift the waveform in time.
3. Press the sub-menu **F4** “EXIT” to return to the graphical display.



SINGLE (graphical soft key)

The **F3** “SINGL” key will trigger a single measurement when the key is pressed. and open a sub-menu which allows time expansion or compression for enhanced waveform viewing.

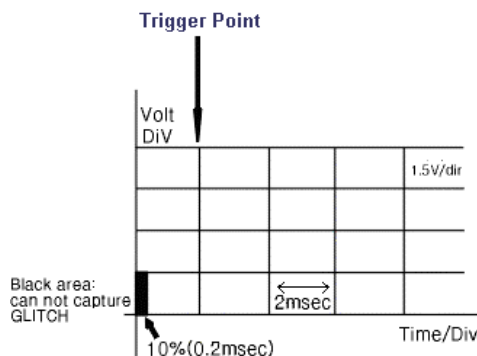
1. Press **F3** to trigger a single measurement.
2. Press the sub-menu **F2** or **F3** arrow keys to change the time/division.
3. Press the sub-menu **F1** key to trigger a new measurement.
4. Press **F4** “EXIT” to return to the graphical display.



GLITC (graphical soft key)

The **F4** “GLITC” key sets the meter to trigger a measurement on any signal which causes an overrange indication or is greater than one vertical division or is greater than 10% of one horizontal division.

1. Press **F4** to set the glitch mode.
2. Any glitch will trigger a measurement.
2. Press the sub-menu **F2** or **F3** arrow keys to change the time/division and reset the glitch trigger..
3. Press the sub-menu **F1** key to reset the glitch trigger..
4. Press **F4** “EXIT” to return to the graphical display.



SOFTWARE INSTRUCTIONS

INSTALLATION

1. Start Windows 95/98.
2. Insert the program disk into drive A:.
3. Select **"START"** and then **"RUN"** from the Windows menu bar.
4. Type **"A:\SETUP.EXE"** in the OPEN box and select **"OK"**
5. Follow the installation instructions on the screen.

OPERATION

1. Connect the RS-232 cable between the serial ports of the meter and the PC.
2. Select the **"Mscope"** icon in the START / PROGRAM menu.
3. In the MultiScope opening screen select **"Setup / Comm Port"**. Select the proper COM port and click **"OK"**.
4. Select **"Setup / Sampling Time"** to set the sampling (data record) time for each measurement.
5. Select **"Setup / dB"** to set the dB reference level.
6. Turn the meter ON and select **"Run (on the menu bar) and Start"**. The PC display will indicate the measured value on the large display and also in a list format with the associated time of measurement.
7. Select **"Run / Stop"** to stop the data recording.
8. Select **"Graph / Bar or Line"** to plot the data in graphical format.
9. Select **"File / Save"** to save the recorded data.
10. Select **"File / Open"** to open an existing file.
11. Select **"File / Print"** to print the file.
12. When the meter is in the graphical mode, press **"MIN/MAX"** to capture a waveform display to the PC screen.

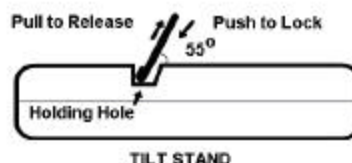
NOTE: Capturing a waveform will delete any active recorded data. To save any recorded data, save it before using **"MIN/MAX"** to capture or capture the screen to the MultiScope memory for later recall.

CAUTION: Always observe the MultiScope LCD display for overload conditions. If an overload occurs, the MultiScope software displays the maximum value for the range selected. It does not indicate an overload on the PC screen. i.e. If the 40V range was held and a voltage greater than 40V was applied to the test leads, the PC display will indicate **"40.00"**, not **"OL"** or the actual voltage. To avoid this condition, Autoranging is recommended

TILT STAND

The tilt stand can be placed either in the locked stand position for flat surface use or in the hinged position for hanging use.

1. For use on a flat surface, lift the stand to approximately a 55 degree angle and push in until the stand locks in the holding hole.

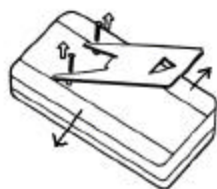


2. To hang the meter, squeeze the legs of the stand and remove it from the meter. Turn the stand 180 degrees and replace in the holder. The stand will now swing free over the top of the meter.

BATTERY REPLACEMENT

Caution: Do not use non-rechargeable batteries (alkaline, carbon-zinc, etc.) with the optional AC power adaptor. The AC power adaptor may be used when the optional rechargeable Ni-Cd batteries are installed.

1. Lift the tilt stand and remove the two screws.
2. Lift the two battery covers up to remove them.
3. Replace the six batteries. Observe the proper polarity as indicated in the compartment.



MULTISCOPE BATTERY TUBES

Contained within this package you will find two hollow cardboard tubes. The purpose of these tubes is to hold the batteries in place in the battery compartment. Directions for proper installation : Remove the battery cover screw, then remove the battery cover itself. Insert three AA batteries into each

tube, (always observing proper polarity). Now insert the full tube into the battery compartment, (observing proper polarity), replace the battery cover then replace the screw.

FUSE REPLACEMENT

1. Lift the tilt stand and remove the two screws.
2. Lift the two battery covers up to remove them.
3. Remove the batteries.

4. Lift to remove the fuse cover.
5. Replace any defective fuse with a fuse of the same type.

CALIBRATION / REPAIR SERVICES

Extech offers complete repair and calibration services for all of the products we sell. For periodic calibration, NIST certification or repair of any Extech product, call customer service for details on services available. Extech recommends that calibration be performed on an annual basis to insure calibration integrity.

WARRANTY

EXTECH INSTRUMENTS CORPORATION warrants the basic instrument to be free of defects in parts and workmanship for one year from date of shipment (a six month limited warranty applies on 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 for authorization. **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.

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