QUICK REFERENCE GUIDE

METER, MEGOHM, EM1001A
7Z 6625-01-XXX-XXXX

MANUAL REVISION: - **01 JUNE 2015**
P/N: EM1001A

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WARNING!

DANGEROUS VOLTAGES ARE GENERATED BY THIS EQUIPMENT

FAILURE TO PROPERLY FOLLOW INSTRUCTIONS CAN LEAD TO SERIOUS INJURY, DEATH OR DAMAGE TO EQUIPMENT

THE EM1001A CONTAINS NO OPERATOR SERVICEABLE COMPONENTS

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CHAPTER 1
INTRODUCTION

1.1. SCOPE

This manual contains basic operating instructions for the Meter, MegOhm, model EM1001A, hereinafter referred to as the Meter.

NOTE

REPRODUCTION AND DISTRIBUTION OF THIS TECHNICAL MANUAL IS AUTHORIZED FOR U.S. GOVERNMENT PURPOSES.

1.2. PURPOSE AND USE

The Meter is a portable testing unit for measuring resistances into the TeraOhms.

It is important that a new user familiarize themselves with the updated controls and indications as listed in Chapter 3.

1.3. EQUIPMENT DESCRIPTION

Refer to Figure 1. The Meter comprises the equipment listed in Table 1.

TABLE 1. EQUIPMENT SUPPLIED

Part Number: EM1001A		
Assembly: Meter, MegOhm		
ID	Description	Part Number
1	Meter, MegOhm	EM1001A
	Pouch, Accessory	TBD
	Plate, Mounting, Pouch	TBD
	Fuse, .2A 250V FB	0235.200MXP
2	Kit, Meter Lead	EM1001A-KIT
	Card, Kit Component	TBD
	Lead, Probe	6365
	Clip, Spring Loaded	6264
	Tip, Probe	6262
3	Cord, Power	DP/N 05120P
4	Manual, Quick Reference	TSE-XXX

A brief description of the major components that make up the Meter is given in the following paragraphs.

Figure 1. METER COMPONENTS

1.3.1. Meter, MegOhm

The Meter (Figure 1-1) is designed to accurately

generate a test voltage from 10 to 1100VDC to measure high resistances into the TeraOhms.

1.3.2. Kit, Meter Lead

The Kit, Meter Lead (Figure 1-2) is designed to provide a secure storage container for the Meter leads, as well as the small adapters. It uses closed-cell foam to ensure ease of cleaning and maintenance, as well as a parts illustration card.

1.3.3. Cord, Power

The Power Cord (Figure 1-3) supplied with the Meter is a North American standard 3-prong.

NOTE

The AC power cord furnished with the Meter can only be plugged into standard North American 110VAC outlets. When using the Meter with a 220VAC power source, it is necessary to either replace the power cord or use an appropriate adapter so that the plug may be used with the 220VAC outlet.

The Meter may be operated with a 110 / 220V, 50 / 60 / 400Hz power source. No configuration changes are required to alter the AC input.

1.3.4. Manual, Quick Reference

The Quick Reference Manual (not shown) is provided to assist the operator with the use of the Meter.

CHAPTER 2
GETTING STARTED

It is important that the operator read and understand the usage of the "CHASSIS CONNECTION" switch. Failure to properly use this switch could cause damage to the Meter. Refer to Step 2.6 for a detailed description of the switch and its use.

2.1. POWERING ON

Powering the Meter on is as simple as connecting AC power and switching the Power Switch (located above the AC Inlet) to the right, or the "ON" position. The Meter will briefly display a start-up screen.

NOTE

Ensure that the "UNKNOWN" terminals do not have anything connected to them prior to starting the next step. Any item connected to the "UNKNOWN" terminals will cause the "SET ∞" steps to fail and affect all measurements.

2.2. SET INIFINITY

Once the Meter start-up screen has extinguished, the "SET INFINITY" screen will appear (Figure 2-1). It will display a number on the middle of the screen (Figure 2-2), which may be unstable. This is normal. Adjust the "SET ∞" knob (Figure 2-3) for a numerical value of zero and press the "OK" button (Figure 2-4).

FIGURE 2. SET INFINITY

2.3. SET HI INFINITY

Once the “OK” button has been pressed, the “SET HI INFINITY” screen will appear (Figure 3-1). It will display a number in the middle of the screen (Figure 3-2), which may be unstable. This is normal. Adjust the “SET HI ∞” knob (Figure 3-3) for a numerical value of zero and press the “OK” button (Figure 3-4).

FIGURE 3. SET HIGH INFINITY

The Meter is now ready for use.

2.4. VOLTAGE SETTING

From the Meter Main display, to change the output voltage, press the “OK” button (Figure 4-1) to enable the voltage setting feature, which will be represented by a horizontal bar beneath the displayed voltage (Figure 4-2).

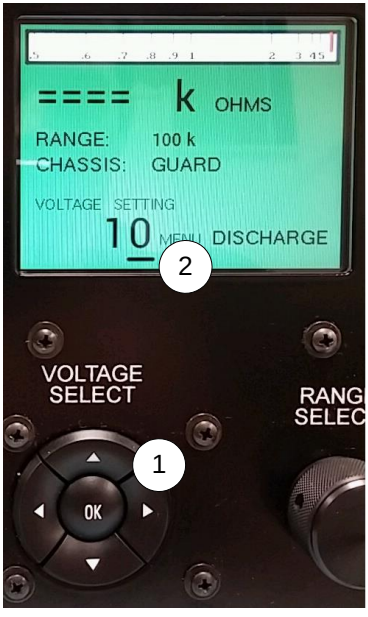

FIGURE 4. SETTING THE VOLTAGE

Once the correct voltage is set, press the “OK” button (Figure 4-1) again to set the voltage, which will be represented by the displayed voltage without the horizontal bar beneath the displayed voltage (Figure 4-2).

NOTE

The voltage will not be updated and set until the “OK” button is pressed.

2.5. RANGE SETTING

To change the range (Figure 5-1), rotate the “RANGE SELECT” knob (Figure 5-2) to the left or right.

NOTE

The “RANGE SELECT” rotary switch does not have stops and will spin freely in both directions. This is normal.

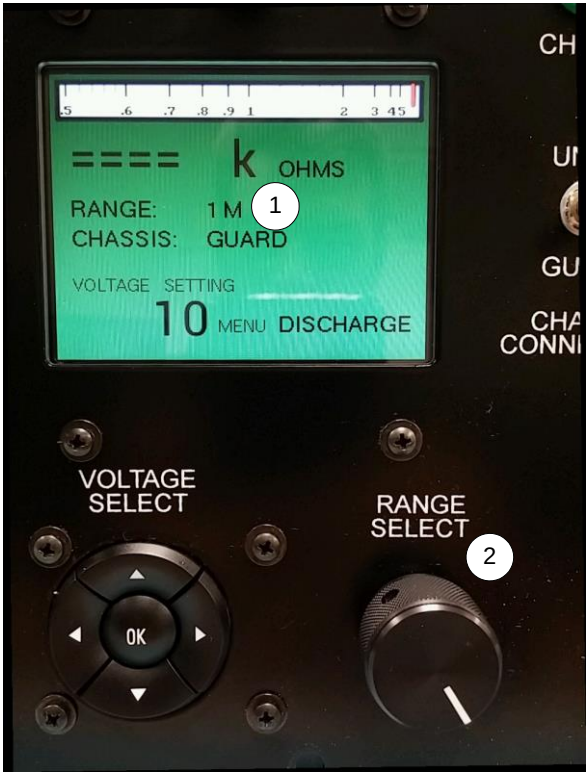

FIGURE 5. RANGE SELECTION

NOTE

The "RANGE SELECT" rotary switch does not function in the Auto-Range Mode. This is normal.

2.6. CHASSIS CONNECTION SWITCH

The Meter was designed with operator safety of foremost importance, which includes the replacement of older, exposed binding posts (Figure 6) with new safety jacks (Figure 7-2 and 7-3).

FIGURE 6. LEGACY POSTS

FIGURE 7. SAFETY POSTS

It is not possible to change the “CHASSIS CONNECTION” (Figure7-3) switch position in any mode except for “DISCHARGE” to prevent accidental damage to the Meter. If the operator attempts to change the switch setting in either

the “CHARGE” or “MEASURE” modes, the Meter will display a warning screen (Figure 8).

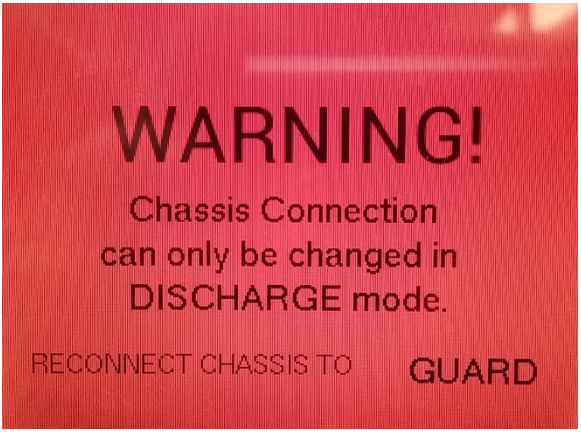

FIGURE 8. WARNING SCREEN

2.7. FUSE REPLACEMENT

The AC Inlet (Figure 9-1) contains the fuse holder, which is accessed by first removing the power cord and pulling up on the fuse housing tab (Figure 9-2). The fuse holder will pull straight vertically from the AC Inlet, but is captive and is not to be removed (Figure 10).

The fuse holder, fully retracted (Figure 10-1), is held in place by a tab when opened. The holder has two rectangular recesses, one for the spare fuse (Figure 10-2) and the fuse used by the Meter (Figure 10-3). When replacement is required, removed the fuse in Figure 10-3 and discard. Remove the fuse in Figure 10-2 and place into the holder in Figure 10-3. Replace the spare fuse when practicable.

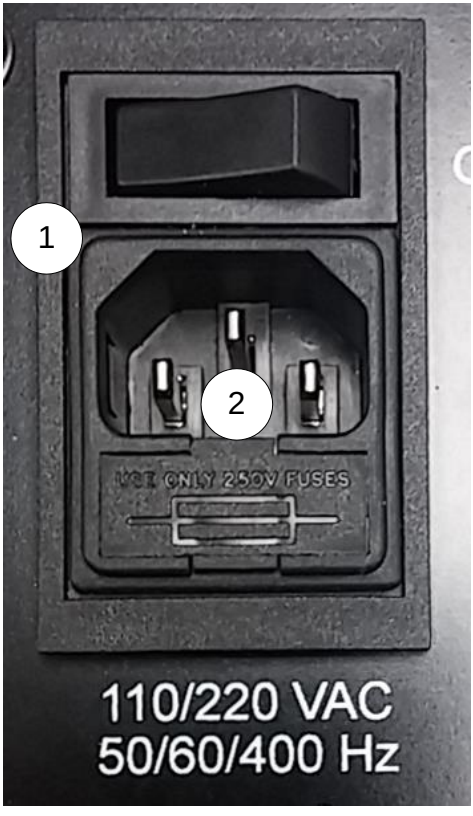

FIGURE 9. FUSE LOCATION

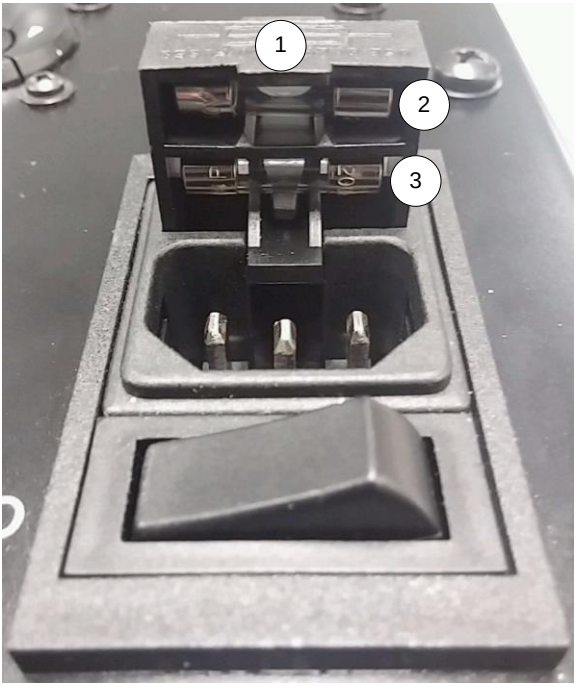

FIGURE 10. FUSE HOLDER

CHAPTER 3
CONTROLS AND INDICATORS

3.1. GENERAL

This section provides a description of the Meter's controls and indicators. There are no operating controls or indicators on any other items included with the Meter.

3.2. CONTROL AND INDICATORS

Figure 11 shows the controls and indicators for the Meter. Table 2 details the function and use of each control and indicator.

FIGURE 11. CONTROLS AND INDICATORS

TABLE 2. CONTROLS AND INDICATORS

Part Number: EM1001A		
Assembly: Meter, MegOhm, Faceplate		
ID	Control/Indication	Function
1	AC Inlet / Power Switch	Provides for connection of external AC Power to the Meter, either 110/220VAC at 50/60/400Hz. The AC Fuse is located within this inlet.
2	Output Jack	Provides a DC-level output based upon the analog meter position and the voltage level.
3	SET ∞ / SET HI ∞	Allows for the compensation of ground loop error, providing for a more accurate measurement.

4	HIGH VOLTAGE indication	Illuminates when voltage is present on the UNKNOWN terminals regardless of level.
5	CHASSIS	A direct connection to the Meter's chassis for certain measurements.
6	UNKNOWN	The jacks used to perform measurements. High voltage may be present during normal operations.
7	 CHASSIS CONNECTION (UNK+ - OPEN – GUARD)	⚠ **Refer to Section 2.6 prior to use.** A locking 3-position switch that replaces the older binding post clips. Can only be changed in DISCHARGE mode.

8	MEASURE - CHARGE - DISCHARGE	DISCHARGE: Disables the voltage output and connects the UNKNOWN to a grounded resistor. This is the "SAFE" mode. CHARGE: Connects the output directly to the load through the unknown terminals. No measurements are performed in this mode. MEASURE: Enables the voltage output and allows for the resistance measurement function to occur.

9	RANGE SELECT	A rotary switch with no stops. Allows for the selection of the measurement range. This function is disabled in "AUTORANGE" mode.
10	VOLTAGE SELECT	Used to alter the output voltage. Press "OK" to bring up the cursor, then use the left / right arrows to select the voltage decade. Use the up / down buttons to change the voltage. Press "OK" to set. Maximum voltage is 1100VDC.

11	LCD Display	Displays all information relative to the operation of the Meter, to include switch positions, measured values and range selection.

3.3. LCD DISPLAY (MAIN)

The Meter's full-color LCD display provides the operator with a large amount of information in a small space.

Figure 12 shows the LCD Display Main information, while Table 3 details the function and use of each indication.

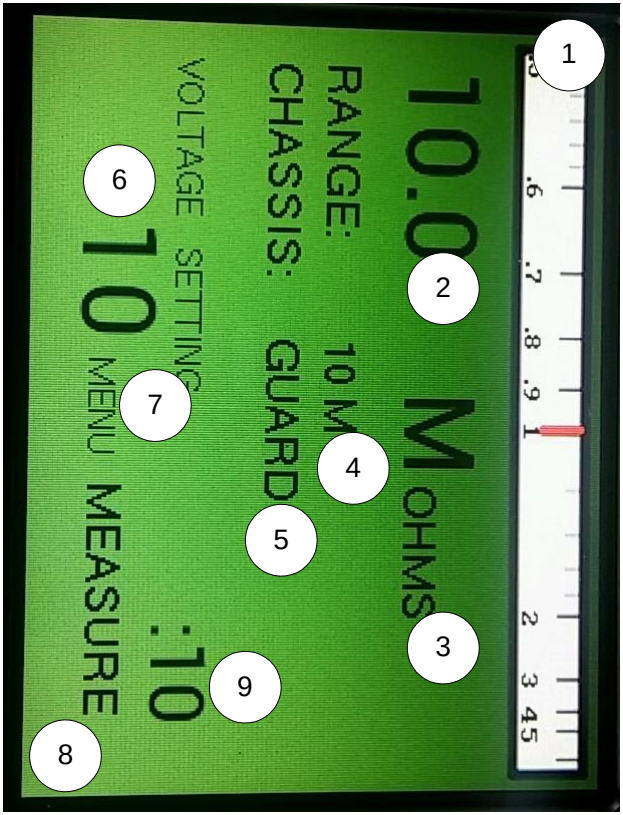

FIGURE 12. LCD DISPLAY INDICATIONS (MAIN)

TABLE 3. LCD DISPLAY (MAIN)

Part Number: EM1001A		
Assembly: Meter, MegOhm, LCD Display		
ID	Control/Indication	Function
1	"Analog" Meter	Indicates the measured value on a simulated analog strip chart. The red bar simulates the analog meter needle.
2	Measured Value	The value shown here is the measured resistance.
3	Measured Value Units	Indicates the unit of measurement of the measured value. k = kiloOhms M = MegOhms G = GigOhms T = TeraOhms
4	Range Setting	Indicates the measurement range and provides feedback on where the front-panel range

		switch is currently set.
5	Chassis	Provides the operator with visual feedback that the “CHASSIS CONNECTION” switch is set per requirements.
6	Voltage Setting	Indicates the current output voltage setting. The value shown here is only provided at the “UNKNOWN” terminal when the Meter is in “MEASURE” mode.
7	Menu	This selection takes the operator into the “MENU” functions. It is not required for normal operation.

8	MEASURE - CHARGE - DISCHARGE	Provides visual confirmation to the operator that the Meter “MEASURE – CHARGE – DISCHARGE” switch is in the correct position.
9	Timer	Provides the operator with an easily viewed timer. Timer resets every time the Meter is switched back into “MEASURE” mode.

3.4. LCD DISPLAY (MENU)

The Meter’s Menu function can be accessed by moving the Voltage Select cursor underneath the “MENU” indication and pressing “OK”.

Figure 13 shows the LCD Display Menu information, while Table 4 details the function and use of each indication.

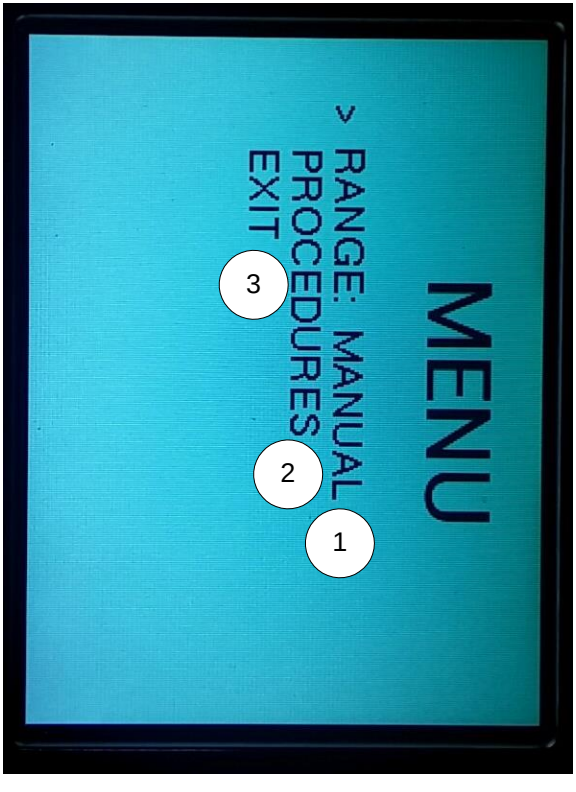

FIGURE 13. LCD DISPLAY INDICATIONS (MENU)

TABLE 4. LCD DISPLAY (MAIN)

Part Number: EM1001A		
Assembly: Meter, MegOhm, LCD Display		
ID	Control/Indication	Function
1	Range: Manual / Automatic	Allows the user to switch the Meter from Manual Mode to Automatic Mode. Manual: The operator is responsible for stepping through the various ranges to perform the measurement function. Automatic: The Meter controls the Range selection, and locks out control of the Range knob from the operator. It is still

		the responsibility of the user to set the Output Voltage in Automatic mode.
2	Procedures	This selection is only available in Navy Meter's with the "A" designation at the end of the model number (e.g., EM1001A). Allows for a semi-automated way of executing test procedures.
3	Exit	Returns the user to the measurement screen.

CHAPTER 4
MAINTENANCE INSTRUCTIONS

4.1. PREVENTATIVE MAINTENANCE

The Meter should be inspected periodically so that potential defects can be detected and corrective action be taken prior to damage or failure of the equipment occurs per Table 3.

TABLE 5. PREVENTATIVE MAINTENANCE CHECKS

Item	Item to be Inspected	Procedure
1	Meter	Check for cleanliness. Clean as necessary (para 4.1.1) Check security of the screws that attach the front panel of the Meter to the case mount assy. Check knobs, switches and indicators for security.

		Check all rubber boots, grommets and seals for nicks or cuts. Operate switches to each position to verify normal operation. Ensure there is no jamming or binding.
2	Kit, Meter Lead	Check for cleanliness. Clean as necessary (para 4.1.1) Check for completeness per the included inventory card.
3	Power Cord	Remove cover and check for damaged contacts or insulation. Check for dry rot, nicks and cuts. Clean as necessary (para 4.1.1)

4.1.1. Cleaning

WARNING

When using commercial cleaners, ensure that all environmental, safety and health regulations are met.

CAUTION

Do not wipe the Front Panel Assembly, LCD display or enclosure rubber seals with harsh chemicals as damage could result. If the front panel of the Meter requires cleaning, use either water, or a gentle cleaner.

1. Remove dust and loose dirt from the equipment using a clean, lint-free cloth.
2. Remove grease and ground-in dirt with a cloth dampened (not wet) with an approved cleaner and a clean cloth.
3. Cleaning should be performed as necessary. No cleaning per a defined schedule is required.

4.2. TROUBLESHOOTING

Table 6 provides the troubleshooting instructions for the Meter. The instructions comprise a list of the most likely symptoms, their probably causes, and the recommended corrective action.

NOTE

If the fault cannot be isolated or resolved by the following procedure in Table 6, refer to Table 5 to carry out the preventative maintenance steps prior to beginning repair.

TABLE 6. TROUBLESHOOTING GUIDE

Step	Symptom	Probable Cause	Corrective Action
1	Meter does not power on.	1.Unit is not plugged in 2.Defective Power Cord 3.Blown Fuse	1.Plug unit in appropriate power source 2.Replace Power Cord 3.Replace Fuse in the AC Inlet
2	LCD Display does not display	Faulty LCD Display Assy	Return for repair
3	Unable to attain a Zero when adjusting SET ∞	Faulty ground connection at AC Source	Confirm the AC Source ground is properly connected.

4	Unable to change the CHASSIS CONNECTION setting	1.Meter is in MEASURE mode 2.The switch is defective	1.Place the Meter into DISCHARGE mode prior to changing the setting. 2.Return for repair.
5	Range Select switch does nothing	1.Meter is in Automatic measurement mode 2.The switch is defective	1.Place the Meter into Manual mode. 2.Return for repair