User's Guide

EXTECH INSTRUMENTS
A FLIR COMPANY

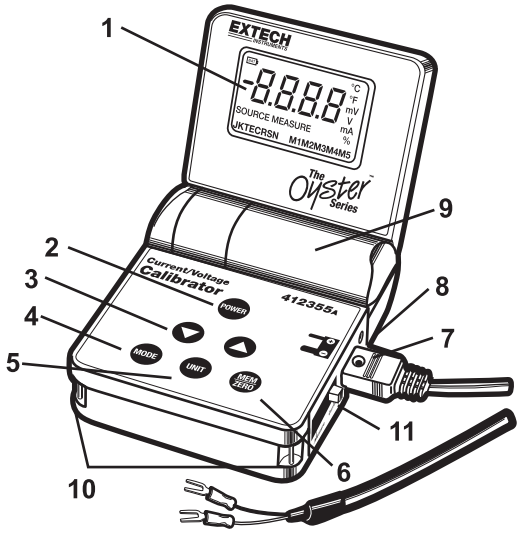
Model 412355A Current / Voltage Calibrator

Introduction

Congratulations on your purchase of the Extech Current/Voltage Calibrator. The Model 412355A can measure and source current and voltage. The Oyster Series meters have a convenient flip up display with neck-strap for hands-free operation. This meter is shipped fully tested and calibrated and, with proper use, will provide years of reliable service.

Meter Description

1. LCD display
2. POWER button
3. UP and DOWN buttons
4. MODE button
5. UNIT button
6. MEM and ZERO button
7. Input/Output mini-connector
8. AC adaptor jack
9. Battery compartment
10. Neck strap holders
11. Function switch



Operation

POWER BUTTON and AUTO POWER OFF FEATURE

1. Use the POWER button to turn the unit ON or OFF. When the unit is powered up, a short self-test will ensue after which the display will stabilize.
2. This meter can either be powered by one 9V battery or an AC adapter.
3. When the battery symbol appears on the LCD display, replace the battery as soon as possible. Low battery power may cause inaccurate readings and erratic meter operation.
4. This instrument is equipped with Auto Power OFF which turns the meter off after 10 minutes of inactivity. To override this feature; press and hold the MODE button until the display shows nAtP (auto power off de-activated) or AtP (auto power off activated).

FUNCTION SLIDE SWITCH

Slide the Function switch on the side of the meter to the desired function (Voltage or Current)

MODE

Press the MODE button to select either SOURCE (output) or MEASURE (input)

UNIT BUTTON

Press the UNIT button to select:

1. Voltage mode: mV or V in source.
2. Current mode: mA or % in source or measure

▲ ▼ OUTPUT ADJUST BUTTONS

Press the ▲ ▼buttons to increase or decrease the output voltage or current value in the source mode.

1. Press the ▲ button once to increase the value in one digit steps.
2. Press and hold the ▲ button to increase the value in 10 digit steps.
3. Press and hold the ▲ button > 2 sec and then press the ▼ to increase the value in 100 digit steps
4. To decrease the value, use the ▼ button as described above.

ZERO BUTTON

The ZERO button manually zeros the display in the MEASURE mode.

1. Set the meter to the MEASURE mode
2. Short the input jack
3. Press and release the ZERO button.

MEM BUTTON

The memory feature provides 5 user settable source values for stepped calibration outputs. The feature is available for Voltage, mA and % in the SOURCE mode. The memory values are stored in nonvolatile memory and are not erased when power is turned off.

Sourcing from the stored memory values:

1. Select the Source mode
2. Press the MEM button. The M1 icon (memory location 1) will appear in the display and the value stored in that location will be displayed and sourced.
3. Repeated pressing of the MEM button will step through the 5 memory locations.

NOTE: The "**SOURCE"** icon will blink when the output value has not reached a stable level. The common cause for the "**SOURCE"** icon to remain blinking is that the load impedance is too high in the current mode or too low in the voltage mode.

Storing values into memory:

1. Select and display a memory location (M1 to M5)
2. Press the ▲ ▼ buttons to adjust the display to the desired source value.
3. Press and hold the MEM button for > 2 seconds. The displayed value will be stored into the displayed memory location.

Default memory values.

Five common source values are permanently programmed in memory as the default values. These values can be replaced by user selected values.

To reset the meter to the default memory values:

1. Turn the meter on and select the SOURCE mode.
2. Press and hold the POWER button for >4 seconds. dFLt will briefly appear in the display and the default values will be stored into memory.

Default Memory Values					
	M1	M2	M3	M4	M5
mV	0mV	500mV	1000mV	1500mV	2000mV
V	2V	5V	10V	15V	20V
mA	4mA	8mA	12mA	16mA	20mA
%	0%	25%	50%	75%	100%

Over-range / Under-range Indication

Signals above or below the units ranges will be indicated by "HHHH" for above and "LLLL" for below.

MEASURE (Input)

In this mode, the unit will measure voltage or current.

1. Select Voltage or Current on the Function switch.
2. Turn the meter ON
3. Press the MODE button to select MEASURE
4. Press the UNIT button to select mA or % if current is selected.
5. Connect the Calibration Cable to the meter.
6. Connect the Calibration Cable to the device or circuit under test.
7. Read the measurement on the LCD display.

SOURCE (Output)

In this mode, the unit will source (output) voltage or current.

1. Select Voltage or Current on the Function switch.
2. Turn the meter ON
3. Press the MODE button to select SOURCE
4. Press the UNIT button to select V or mV if voltage is selected or to select mA or % if current is selected.
5. Connect the Calibration Cable to the meter.
6. Connect the Calibration Cable to the device or circuit under test.
7. Use the ▲ ▼buttons to select the desired output value. Use the LCD display to verify the output level. Alternatively, use the stored calibration values in memory as described in the MEM button section.
8. For the -25% to 125% output range the output is 0 to 24mA.

% Display	-25%	0%	25%	50%	75%	100%	125%
mA output	0mA	4mA	8mA	12mA	16mA	20mA	24mA

NOTE: The "**SOURCE"** icon will blink when the output value has not reached a stable level. The common cause for the "**SOURCE"** icon to remain blinking is that the load impedance is too high in the current mode or too low in the voltage mode.

Battery Replacement

When the LOW BAT message appears on the LCD, replace the 9V battery as soon as possible.

1. Open the calibrator's lid as far as possible.
2. Open the battery compartment using a coin at the arrow indicator.
3. Replace the battery and close the cover.

Specifications

General Specifications

Display	9999 count LCD
Meter Power	9 volt battery or 9V AC adaptor
Auto Power OFF	Meter automatically powers off after 10 minutes of inactivity
Current output capability	24mA at 1000 ohms
Operating Temperature	41ºF to 104ºF (5ºC to 40ºC)
Storage Temperature	- 4°F to 140°F (-20°C to 60°C)
Operating Humidity	Max 80% up to 87ºF (31ºC) decreasing linearly to 50% at 104ºF (40ºC)
Storage Humidity	<80%
Operating Altitude	7000ft. (2000meters) maximum
Dimensions	3.8 x 4.7 x 1.8" (96 x 118 x 45mm) folded
Weight	12 oz. (340g)
Accessories Supplied	9V battery, AC adaptor and calibration cable with spade lugs

Range Specifications

Mode	Function	Range	Resolution	Accuracy (% of reading)
Measure	Voltage	0 to 2000mV	1mV	± (0.075% + 1 digit) or ± 3 digits, whichever is greater
		2.00 to 20.00V	0.01V	
	Current	0.00 to 50.00mA	0.01mA	
	%	-25.0 to 230.0%	0.1%	
Source	Voltage	0 to 2000mV	1mV	
		2.00 to 20.00V	0.01V	
	Current	0.00 to 24.00mA	0.01mA	
	%	-25.0 to 125.0%	0.1%	

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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Support line (781) 890-7440

Technical Support: Extension 200; E-mail: support@extech.com

Repair & Returns: Extension 210; E-mail: repair@extech.com

Product specifications subject to change without notice

For the latest version of this User's Guide, Software updates, and other up-to-the-minute product information, visit our website: www.extech.com

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