User Guide

EXTECH®
## INSTRUMENTS

Model 412300A Current Calibrator

Introduction

Congratulations on your purchase of the Extech Current Calibrator Model 412300A. The 412300A can measure/source current and can also power a current loop. A built-in five location memory can store customized calibration current output steps. 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. Battery Compartment
3. AC adaptor jack
4. Calibration Cable input
5. Function switch
6. Neck-strap posts
7. Keypad
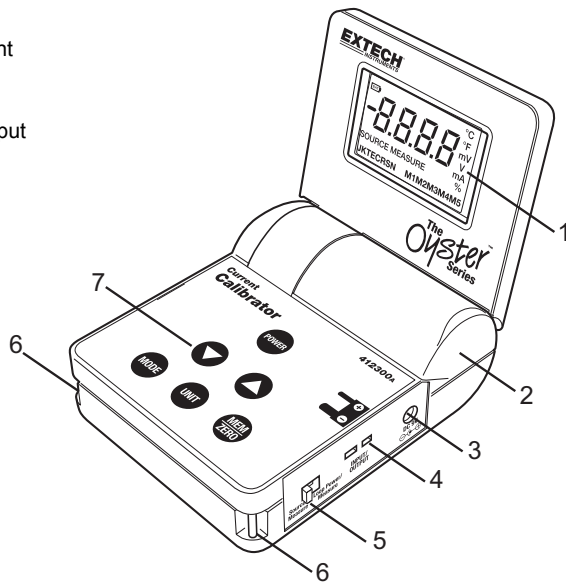
Keypad and Switch Descriptions

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. Note that if the meter is going to be powered by the AC adapter, remove the 9V battery from the battery compartment.

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

1. Slide the Function switch on the side of the meter to the desired function (Source/Measure or Power/Measure).

2. In the Source/Measure position the meter can be used to generate current or measure current (MODE button is used to choose Source or Measure).

3. In the Power/Measure position, the meter can power a current loop with 24Vdc and, at the same time, measure the current.

MODE BUTTON

Press the MODE button to select either SOURCE (output) or MEASURE (input). This applies when the Function switch is set to Source/Measure.

UNIT BUTTON

Press the UNIT button to select **mA** or **%** units.

▲▼ INCREASE / DECREASE BUTTONS

Use the ▲ ▼ buttons to increase or decrease the output 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 the user with five (5) user programmable source values for stepped calibration outputs. The feature is available for **mA** and **%** units in the SOURCE mode. The stored values are kept in non-volatile memory (memory that is retained even after power is removed from the calibrator).

Source from the stored memory values:

1. Select the Source mode as described earlier

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.

Storing values into memory:

1. As described above, select and display a memory location (M1, 2, 3, 4, or 5)

2. Use 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 in 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 until $dFLt$ appears in the display and then release the POWER button. The memory locations will revert to the default values.

Default Memory Values					
	M1	**M2**	**M3**	**M4**	**M5**
mA	4mA	8mA	12mA	16mA	20mA
%	0%	25%	50%	75%	100%

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Modes of Operation

MEASURE (Input) Mode of Operation

In this mode, the unit will measure up to 50mADC.

1.   Connect the Calibration Cable to the meter.

2.   Connect the Calibration Cable to the device or circuit under test.

3.   Slide the function switch to the SOURCE/MEASURE position.

4.   Turn the meter ON

5.   Press the MODE button to select MEASURE

6.   Read the measurement on the LCD display.

SOURCE (Output) Mode of Operation

In this mode, the unit can source current up to 24mADC at 1000 ohms

1.   Connect the Calibration Cable to the meter

2.   Connect the Calibration Cable to the device or circuit under test

3.   Slide the Mode switch to the SOURCE/MEASURE position

4.   Turn the meter ON

5.   Press the MODE button to select SOURCE

6.   Use the UNIT button to select **%** or **mA** units of measure

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.   **Note** that while the SOURCE display icon is blinking the calibrator is preparing to provide an output but only after the icon stops blinking will the current actually be sourced.

9.   For the -25% to 125% output range the output is 0 to 24mA. Refer to the Table below.

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

POWER/MEASURE Mode of Operation

In this mode the unit can measure current up to 24mA and power a 2-wire current loop. The loop voltage is 24V.

1.   Connect the Calibration Cable to the meter.

2.   Connect the Calibration Cable to the loop. Open the current loop at any convenient location along the signal path.

3.   Slide the function switch to the POWER/MEASURE position.

4.   Turn the meter ON

5.   Read the measurement on the LCD display.

6.   Use the UNIT button to select % or mA units of measure. In "%" mode the display will read from -25.0 to +230.0% representing 0.00 to 50.00mA.

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Specifications

General Specifications

Display	LCD (2000 counts, displays 0 to 1999)
Meter Power	9 volt battery or AC adaptor
Auto Power OFF	Meter automatically powers off after 10 minutes of inactivity
Current output capability	24mADC at 1000 ohms
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	Current	0 to 50mA (0.01mA)	± (0.075% + 1 digit) or ± 3 digits (whichever is greater)
	Percent (%)	-25% to +230% (0.1%)	
Source	Current	0 to 24mA (0.01mA)	
	Percent (%)	-25% to +125% (0.1%)	
Power	Loop Power	24VDC	

Battery Replacement

When the battery symbol appears on the LCD, replace the 9V battery as soon as possible.

1. Open the calibrator's lid as far as possible.

2. With a coin or wide blade screwdriver, open the battery compartment moving in the direction of the arrow embossed on the compartment cover (location of compartment is identified in the meter description section).

3. Replace the battery and close the battery compartment cover.

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 Care 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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