

## Calibration Technology Starts Here

### Precision Current Loop Calibrator with HART Communications/Diagnostics

### The New Standard of Loop Calibration



## LC-110 & LC-110H



The Martel LC-110 and LC-110H are mA (loop) calibrators designed to take the loop calibrator class to the next level. The new LC-110 series features a user friendly interface with dedicated buttons and a rotary encoder (Quick-Set Knob). This combination dramatically reduces the time it takes to measure, or source voltage or current and power up a loop. The rugged case is contoured to easily fit a technician's hand and the large back lit graphics LCD is best in class.

The LC-110H differs from the standard LC-110 in that it incorporates HART communications and supports a select set of the HART universal and common practice commands. This unique feature allows the LC-110H to be used as both a loop calibrator and communication tool.

In the communicator mode the user will be able to read basic device information, perform diagnostic tests, and trim the calibration on most HART enabled transmitters. In the past, this could only be done with a dedicated communicator, high-end multifunction calibrator costing thousands of dollars, or a laptop computer with HART modem. The LC-110H will allow many more technicians to service and support HART devices.

In addition to HART communications, we also gave the user the ability to get information out of the LC-110H. Need to quickly document the parameters of all the HART transmitters in your plant? Just add the BetaLOG HART software/cable to capture and upload to twenty configurations in either (.csv) or (.txt) format.

We did not stop there! How about the ability to data log or record data on a particular transmitter for troubleshooting? The data log tool features selectable capture interval from 1 to 60 seconds and a logging capacity of 9800 records or 99 individual sessions. Each data sample contains the LC110H measurement, all four process variables, and the standard status conditions.

### General Features

- Best in Class Accuracy at 0.01% Reading
- Small Rugged design operates on (6) standard AAA batteries
- Intuitive interface that features a Quick-Set Knob
- 24VDC loop power with mA Measure Mode (-25% to 125%)
- Resolution of 1 $\mu$ A on mA ranges and 1mV on voltages ranges
- Built in selectable 250 $\Omega$  Resistor for HART communications
- Simple two wire connection for all measurements
- Auto Shutdown to conserve battery life (adjustable up to 30 minutes)
- Variable step & ramp time in seconds
- Adjustable span selection (0 to 20mA or 4 to 20mA)
- Valve Test (simulate defined mA values with % keys)

For more information:

- Call us toll free at 800-821-0023 or 603-434-1433
- Fax us at 603-434-1653
- Or go to website, [www. Martelcalibrators.com](http://www.Martelcalibrators.com) and click on LC-110 & LC-110H.
- **Online Demo**
- **Online product comparison**

### Specifications

#### Model LC-110 & LC-110H

**Functions:** mA source, mA simulate, mA read, mA read/loop power, and volts read.

**Ranges:** mA (0 to 24mA) and Volts (0 to 30VDC)

**Resolution:** 1uA on mA ranges and 1mV on voltage range

**Accuracy:** 0.01% +/- 2LSD all ranges (@23° +/- 5°C)

**Operating Temp range:** -10°C to 55°C

**Humidity range:** 10 to 95% non-condensing

**Stability:** 20ppm of F.S./°C from -10°C to 18°C and 28°C to 55°C

**Display:** 128 x 64 pixels, LCD Graphic w/backlight, .34" high digits

**Power:** 6AAA alkaline, lithium, or NiMH batteries

**Battery Life:** ≥ 40 hours continuous use (measure mode using alkaline)

**Loop Compliance Voltage:** 24VDC @ 20mA

**Over-Voltage Protection:** 240VAC

**Overload Current Protection:** 28mA DC

**EMC:** EN61326 Annex A (Portable Instruments)

**Dimensions (L x W x D):** 6" x 3.6" x 1.3" (15 cm x 9 cm x 3 cm)

**Weight:** 9.5 ounces (0.3 kg)

**Included Accessories:** NIST traceable calibration certificate with data, batteries, test leads, and manual

### Operation

The LC-110 & LC-110H utilizes a rotary encoder (Quick-Set Knob) to set the output (mA) and also to select the function to implement. The Quick-Set Knob features an integral push button that you press to enter a selection. A dedicated menu key brings up a list of functions. The Quick-Set interface highlights an item on that list, and then pressing the knob (clicking it) selects that item to drive further in the menu. The "Menu/Exit" key is used to go back to the previous menu or exit from menu structure into measure/source mode. All functions and HART commands are accessed in this manner. When used as mA calibrator only, there are dedicated keys for automatic step and ramp generation as well as keys to perform a quick zero and span (4mA, 20mA and 25% steps).



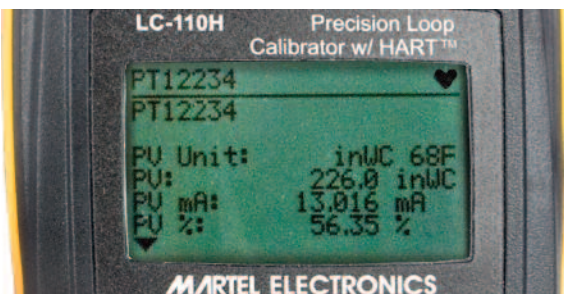
### Additional Features (LC110H)

- Built in HART modem for communication capability to perform the following commands:
  - Read Message
  - Read Tag, Descriptor, Cal Date
  - Read Sensor PV info.
  - Read PV Output info.
  - Read Long Tag
  - Write PV Ranges (Upper and Lower)
  - Enter/Exit Fixed Current Mode
  - Set Zero Offset
  - Trim DAC Zero
  - Trim DAC Gain
- The ability to store up to twenty HART device configuration files for uploading via the BetaLOG Hart software. Configurations can be stored as .csv or .txt files. This allows the end user to document the entire plant for HART devices without spending thousands of dollars for plant assetmanagement software.

### LC110 Series Ordering Information

\*Each unit comes standard with batteries, manual, test leads (banana to alligator clips), and NIST Cert with Data

Part Number	Description
1919974	LC110 Loop Calibrator
1920024	LC110H Loop Calibrator with HART™ Communications
1920050	BetaLOG HART Software with Lemo to USB Cable
6161102	Soft Carrying Case
1920051	LC110H Loop Calibrator Kit:
	BetaLOG HART Software with Lemo to USB Cable
	Soft Carrying Case
	Banana to Mini-grabber® Test Leads
1920049	Lemo to USB Cable
5353050	Test Leads (1 Pair – Banana to Alligator)
5353093	Test Leads (1 Pair – Banana to Mini-grabber®)



**HART**  
COMMUNICATION PROTOCOL



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