



## JOFRA™ Model MLC Multi-Loop Calibrator

- ❑ **Easy-to-Use Precision Signal Loop Calibrator**
- ❑ **Versatile, All-in-One Tool for the Instrument Engineer**
  - Simulator
  - Receiving Controller
  - Power Supply
  - Decade Box
- ❑ **Menu-Driven Displays with Intelligent Prompts**
  - Programmable Step and Ramping Functions
- ❑ **Measure and Simulate mV, V, mA, RTDs, TC and Ohms**
- ❑ **Cold Junction Compensated**

### PRODUCT DESCRIPTION

The JOFRA MLC Multi-Loop Calibrator is a versatile, easy-to-use instrument that may be used for measuring, simulation and calibration. It is an ideal tool for the instrument engineer since it may be used as a simulator, receiving controller, power supply and decade box for maintaining and calibrating a wide assortment of devices including RTDs and Thermocouples. Menu-driven displays with intelligent help prompt guide the user through setup and operation.

#### Measure and Simulate

With the MLC, users can measure and simulate millivolts, volts, ohms, RTDs, Thermocouples and milliamps. It may also be used to provide 24Vdc power for 2/4- and 3-wire 4-20mA or 0-20mA transmitters.

#### Cold Junction Compensation

The MLC calibrator provides three modes of cold junction compensation: automatic, internal or external sensor, and manual.

#### mA Scaling

Readings directly in engineering units may be obtained in both linear and square root relationships. Span limits may be set between -9999 and +9999 related to a scaling of 0-20 or 4-20mA.

#### RTDs

Pt 100 IEC, Ni 100 DIN, or D 100 JIS signals are easily measured or simulated. The connection module allows for quick connection of 2-, 3- and 4-wire RTD systems.

#### Thermocouples

The MLC calibrator may be used to simulate and measure most thermocouple types including J, K, B, R, S, E, N, U and L.

#### Ramp Function

A ramping function allows the user to ramp an output value up or down proportional to time. This function can stop at the selected high or low limit or cycle continuously up or down. Dwell time is also programmable.

#### Step Function/Memory

The instrument's programmable step function provides for storage of up to six calibration values. These values may be recalled manually in sequence or may be sent automatically over a pre-programmed time interval. A special function key on the instrument's front panel allows for output signals in 0%, 25%, 50%, 75% or 100% of a selected span value.

#### Standard Curves

The MLC calibrator provides for calibration in accordance with standard curves including:

- ❑ IEC/ANSI584-1
- ❑ IEC/ANSI751 (385)
- ❑ DIN 43 710 and JIS 392 correlating to IPTS standards

#### Connection Module

The connection module has been provided with a Pt 100 class A sensor for accurate cold junction compensation when using thermocouples. This module provides rugged binding post connectors to secure loose wire ends. RTD and thermocouple simulations may then be performed while both mA input and transmitter power supply remain available for connection.



## SPECIFICATIONS

FUNCTION	RANGE	RESOLUTION	ACCURACY
Measure mV	0 - 120mV	0.01mV	±0.025%
Output mV	-10 - 120mV	0.01mV	±0.025%
Measure Volt	0 - 120V	0.01V	±0.05%
Output Volt	0 - 12V	0.001V	±0.025%
Measure mA	0 - 52mA	0.01mA	±0.05%
Output mA	0 - 24mA	0.01mA	±0.05%
Transmitter Simulation	0 - 24mA	0.01mA	±0.05%
<b>Measure/Simulate</b>			
Ohms	0 - 390 Ohms	0.1 Ohms	±0.1 Ohm
Pt 100	-328/1562°F -200/850°C	0.5°F/0.25°C	±0.5°F/0.25°C
Ni 100	-76/1562°F -60/850°C	0.5°F/0.25°C	±0.5°F/0.25°C
TC - J/L	-346/2174°F -210/1190°C	0.4°F/0.2°C	±0.8°F/0.4°C
TC - K	-346/2498°F -210/1370°C	0.4°F/0.2°C	±1.2°F/0.6°C
TC - K	-382/-346°F -230/-210°C	2°F/1°C	±4°F/2°C
TC - T/U	-103/752°F -75/400°C	0.4°F/0.2°C	±1°F/0.5°C
TC - T/U	-292/-103°F -180/-75°C	0.4°F/0.2°C	±1°F/0.5°C
TC - T/U	-418/-296°F -250/-180°C	0.8°F/0.4°C	±3.2°F/1.6°C
TC - B	1004/3290°F 540/1810°C	2°F/1°C	±5°F/2.5°C
TC - B	599/1004°F 315/540°C	2°F/1°C	±12°F/6°C
TC - B	356/599°F 180/315°C	7°F/4°C	±16°F/8°C
TC - R	-58/3200°F -50/1760°C	1.4°F/0.7°C	±4°F/2°C
TC - S	-58/3200°F -50/1760°C	1.6°F/0.8°C	±4°F/2°C
TC - E	-400/1832°F -240/1000°C	0.2°F/0.1°C	±0.6°F/0.3°C
TC - E	-418/464°F -250/240°C	1.6°F/0.8°C	±4°F/2°C
TC - N	32/2372°F 0/1300°C	0.4°F/0.2°C	±1.2°F/0.6°C

### Notes

R-input > 20M ohms; R-output 0.2 ohms; R-input > 1M ohm; R-output 0.2 ohms; R-max 900 ohms; V-max ext. 56 volts  
 For RTDs and Ohms 1.25mA excitation current, Curves IEC 751 (385) or JIS (392)  
 Thermocouples J, K, T, B, R, S and E in accordance with IEC standard 584-1 or DIN 43710 for U and L

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## FUNCTIONAL SPECIFICATIONS

### Reference

68°F (20°C) ±3K

### Long Term Drift

±0.03% of range per year

### Indicated Accuracies

Specified for 59°F (15°C) to 95°F (35°C). Outside these limits ±1 digit on zero and ±0.005% of range per °C (±0.0025% of range per °F).

### Calibration

Traceable to National Standards with correlation to NIST

### Warm Up Time

2 minutes in a constant ambient temperature

### Cold Junction Compensation

±0.5°F (±0.025°C) with the Pt 100 sensor in the connection module or (automatic at 32°F/°C) 1.4°F (0.8°C) with the semi-conductor sensor in the Model MLC housing or to be set by the user within -99°F/°C

### Excitation Current, RTD Simulation

5mA maximum, either polarity (from any external source)

### Display Readout

4<sup>1/2</sup> or 4 digits depending upon the selected function  
English text

## PHYSICAL SPECIFICATIONS

### Battery Power

4 x 1.5V Type LR14 or Size C

### Battery Life

25 hours with alkaline batteries at 68°F (20°C)  
12 hours with 20mA load

### Low Battery Indication

Pre-warning alternately flashes "Poor Battery Condition"  
Displays steady "Replace Batteries" after 15 minutes

### External Power Supply

6V at 300mA, 2.5mm plug

### Connections

Suitable for 2mm banana plugs or loose wire ends (with connection module)

### Dimensions

8.0 x 4.7 x 1.3-inches (20.0 x 11.7 x 3.2cm)

### Hazardous Area

Designed for use in Div. 2 classified Areas

### Operating Temperature

14 to 122°F (-10 to 50°C)

### Storage Temperature

-4 to 158°F (-20 to 70°C)

### Relative Humidity

0 to 90% non-condensing

### Protection Class

IP 53

### Weight

1.65 lbs (0.75kg) including batteries and carrying case

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## ORDERING INFORMATION

### MODEL MLC MULTI-LOOP CALIBRATOR

Order Number	Description
	<b>Base Number and Range</b>
UN 00002	Model MLC Multi-Loop Calibrator General Purpose, with Carrying Case
UN 00002IS	Model MLC Multi-Loop Calibrator, Intrinsically Safe, with Carrying Case

Accessories	Description
<b>60-90008</b>	Extension Cable Kit
<b>60-90015</b>	Test Lead Set
<b>60-90016</b>	Fuse
<b>60-90019</b>	Carrying Case
<b>60-90021</b>	Battery Eliminator 220V for Single Prong Jack
<b>60-90022</b>	Battery Eliminator 115V for Single Prong Jack
<b>60-90023</b>	Terminal Block
<b>60-90024</b>	Battery Eliminator and Charger 115/230V, 3-Prong Jack
<b>60-90047</b>	Battery Eliminator for Intrinsically Safe Model UN 00002IS
<b>60-90025</b>	Link-Pak SLX RS232 Serial Data Interface for MLC



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