Calibrators & Calibration

Masibus Designed India's First Digital Calibrator in 1979
Calibration refers to the process of adjusting or measuring an instrument or system to ensure that it produces accurate and reliable results. In other words, it involves comparing the readings or output of a device to a standard or known value to determine its accuracy and correct any discrepancies.

**INTRODUCTION**

**WHAT IS CALIBRATION?**

Calibration is required for:

- Protect from process failure
- Increase reliability and consistency of process instrument
- Achieve better process accuracy
- Minimize the DRIFT of process instrument
- Assure compliance and certification
- Provide traceability from known standard
- Ensure safety of the plant
- Save money and increase productivity
- Ensure quality & finish work on time

**THE COSTS AND RISKS OF NOT CALIBRATING**

- Neglecting calibration can lead to production downtime, quality problems and product recalls.
- Risking employee safety.
- Risking customer/consumer safety.
- Loosing licence to operate due to not meeting regulatory requirements.
- Direct economical losses in businesses where invoicing is based on process measurements.
**Portable multifunction calibrator with high accuracy in all modes of operation.**

**Graphical user interface for precise measuring and sourcing of electrical and physical parameters.**

**Designed to give maximum battery life in one full charge, the backlight is adjustable for power saving.**

**Shortcut keys to operate easily for input selection for measure and source/measure respectively.**

**Comes with a mini USB connector for charging, logged data retrieval and firmware upgrade.**

**Sourcing and measurement capabilities with independent parameter and range selection.**

It has mA/ V/ mV/ mA (2W)/ switch-test / RTD/ TC/ measurement capability & also has mA/ V/ mV/ mA(2W)/ Resistance/ RTD/ TC/ Frequency/ Pulse source capability.
Calibrate Pressure Transmitter using UC12

This calibration kit is designed to make multifunction calibration, pneumatic testing, and calibration of mechanical and electronic pressure measuring instruments for a fast and reliable process. This is a cost effective, high-quality, handy, and robust kit which is essential for those who need to perform service and maintenance on pressure & electrical instruments.

The kit includes a pneumatic hand test pump, which allows you to generate a defined test pressure, and a highly accurate digital pressure gauge that serves as a reference instrument and process calibrator for measurement and calibration of process parameters. All the components of the kit are carefully stored in the case, providing protection during transport. The case is compact and easy to carry, making it convenient to take with you wherever you need to go.

Special Features

- Economical and simple operation for multifunction calibration
- Testing and adjustment of pressure gauges, pressure sensors, pressure switches, safety valves and electrical parameters
- Pressure accuracy with 0.05 % & 0.025% FS
- Pneumatic version from vacuum to 40 bar
- Hydraulic version from 0 to 700 bar

HART calibration using UC12

HART Communicator is a device used in the process control industry to configure, monitor, and diagnose field instruments. With a HART Communicator that includes a UC12 process calibrator option, users can calibrate and verify their field instruments quickly and easily, without the need for additional tools.

The process calibrator option allows users to apply a known input signal to the instrument and compare its output to the expected value. This enables accurate calibration and verification of the instrument's accuracy.

In addition, a HART Communicator with a process calibrator option typically includes additional features such as measurement and simulation of electrical signals, allowing users to test and diagnose a wider range of instruments.

Special Features

- Full HART Device Description (DD) support of all HART devices with process calibrator
- Perform HART trim on HART devices
- Convenient wireless connectivity to HART modem
- Easy to use, fast connect and view HART data
- Connectivity through bluetooth and USB
- Use mobile and laptop HART communicator
TC12+ Temperature Calibrator

Graphical user interface for precise measuring and sourcing of electrical and physical parameters.

Designed to give maximum battery life in one full charge, the backlight is adjustable for power saving.

Shortcut keys to operate easily for input selection for measure and source/ measure respectively.

Comes with a mini USB connector for charging, logged data retrieval and firmware upgrade.

It has mA/ V/ mV/ mA (2W)/ switch- test / RTD/ TC/ measurement capability & also has resistance/ RTD/ TC source capability.

**APPLICATIONS**

- Calibrating and checking temperature indicator/ controllers, recorders, temperature transmitters, signal conditioners, etc.
- Laboratory and site calibration purpose
- Measure and simulate thermocouple signals
- Calibration of transmitters and transducers
- DRIFT test of transmitters and transducers

**GENERAL SPECIFICATIONS**

- **Display Mode**
  - Measure: mA/ V/ mV/ mA(2W)/ switch-test / RTD/ TC
  - Source: Resistance/ RTD/ TC

- **Supported Units for RTD/ TC Type**
  - °C/ °F/ °K

- **Maximum Resistance**
  - Excitation Current (Simulation/Resistance/ RTD mode)
  - Current outlets: 2.0V/ 1mA, 1mA/ 3VDC

- **Setting Time**
  - Pulse Currents RTD Simulation: >1 ms

- **Response Time**
  - Input: <100ms, Output: <100ms

- **Load Impedance**
  - Total: IEXCI 2.0V/ Rsensor (650....4000Ω)

- **Data Logging**
  - Periodic logging: 150000 readings max.
  - Logged data is stored in a user defined file

- **Communication Interface**
  - USB 2.0

**TECHNICAL SPECIFICATIONS**

### Electrical Measurement Parameters & Accuracy

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage (V)</td>
<td>0 to 30.00 VDC</td>
<td>0.001 V</td>
<td>±0.02% of reading ± 0.02mV</td>
</tr>
<tr>
<td>Current (mA)</td>
<td>0 to 24.000 mA</td>
<td>0.001 mA</td>
<td>±0.02% of reading ± 0.02mA</td>
</tr>
</tbody>
</table>

**Visit masibus.com** for the complete Technical Specication.
Calibration Test Benches are workstations for the maintenance and calibration of process instruments. Masibus Test Bench configurations are developed with intelligence of versatile & modular design, keeping in mind the instrument testing & calibration procedures. The modular concept gives it the ease and makes it possible for a wide range of configurations & performance capabilities. All calibration benches are custom-built and engineered, meeting industry applications & standards of maintenance & calibrations of various devices used in the plant. It helps industry to maintain calibration data & healthiness of all field devices to give optimum performance.

### Key Differentiators

| Made of heavy grade, high quality CRCA and aluminium fabrications | Load capacity: 200kg modular design, easy change of arrangement | Flexible maintenance - Device modular structure |
| Complete aluminium profile based option availability | Proper electrical earthing provided on test bench | Documenting version available with PC connectivity |
| Accurately fabricated, welded & powder coated structure | Manual/ automatic pressure & temperature calibration choice | Options for HART, PA, FF communication available |
| Smooth surface & ultra simple to clean | Superior quality & sleek look | Table top: Laminated chip board of 25 mm thickness |

### Types of Test Bench

- **Multi Function Test Bench**
  - Calibration facility for pressure, temperature & electrical instruments
  - Flexible maintenance - Device modules structure
  - Option for (HART, PA, FF) communication
  - Documenting version available with PC connectivity

- **Pressure Test Bench**
  - Highly accurate pressure calibration for range from vacuum to high pressure upto 1000 bar
  - Manual/ automatic pressure calibration choice
  - Pneumatic or hydraulic versions
  - Precise pressure controller source from vacuum to 210 bar

- **Temperature Test Bench**
  - Manual/ fully automatic temperature calibration choice
  - Provision of inserts of standard and customized size of holes for temperature dry blocks
  - Option for (HART, PA, FF) communication

- **Electrical Test Bench**
  - ESD protection enables safe handling of delicate components
  - Isolation transformers, fault current & overload protections & emergency stop switch
### TECHNICAL SPECIFICATIONS

#### Measurement Range

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Range</th>
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</tr>
</thead>
<tbody>
<tr>
<td>mV</td>
<td>0-250.00 mV</td>
<td>0.01 mV</td>
<td>±0.02% of reading ± 2 counts</td>
</tr>
<tr>
<td>V</td>
<td>0-30.000 VDC</td>
<td>0.001 V</td>
<td>±0.02% of reading ± 2 counts</td>
</tr>
<tr>
<td>mA</td>
<td>0-24.000 mA</td>
<td>0.001 mA</td>
<td>±0.02% of reading ± 2 counts</td>
</tr>
</tbody>
</table>

#### Source Range

<table>
<thead>
<tr>
<th>Parameter</th>
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<tr>
<td>V</td>
<td>0-12.000 VDC</td>
<td>0.001 V</td>
<td>±0.02% of reading ± 2 counts</td>
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<tr>
<td>mA</td>
<td>0-24.000 mA</td>
<td>0.001 mA</td>
<td>±0.02% of reading ± 2 counts</td>
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#### Display Mode

- Measure + Source, Measure only, Source only, Switch test + Source

#### Max. Input Voltage

30 ppm

#### Input Impedance

V, mV: >1 MΩ
mA: =10 Ω

#### Response Time

Input: >100ms
Output: <100ms

#### Load Impedance

- >10 KΩ for mV/V
- <750 Ω for mA

#### Display Update Rate

10 readings / sec.

#### Isolation

500VDC between measure & source

#### Data logging

Logged data is stored in a user defined file in internal memory
Periodic logging: 15,000 readings max.

#### Communication Interface

USB 2.0

#### Display

2.4” TFT LCD, 262K Color, Graphical, 42.72 mm x 62.26 mm, 240x320 pixels, White LED backlight

#### Special Features

- Shortcut keys to operate easily for input selection for measure and source/measure respectively.
- Automatic step/ramp output with auto/man selection, data logging, max/min/average values, scaling to engineering units & filter settings enhances the use of LC 12.
- Comes with a mini USB connector for charging, logged data retrieval and firmware upgrade.

#### Loop Power Output

24V DC, ±10% (24mA maximum)

#### HART mA Loop Resistor

250 Ω ±20%

#### Switch Test

- Trigger level: 24V (2V)
- Voltage level detection: Trigger level: 0 to 30V in 1V steps
- Input Impedance: >1 MD

#### Physical

- Dimensions (in mm): 161.7 (L) x 82.1 (W) x 39.5 (H)
- Housing Material: ABS plastic
- Electrical Terminals: Four nos. 2 mm safety sockets
- Weight: <300 grams

#### Environmental

- Operating Temperature: 0 to 55 °C
- Storage Temperature: -20° to 60 °C
- Relative Humidity: 30% to 90% non-condensing
- Warm-up Time: 15 minutes

#### Accessories

- Calibration Certificate
- User guide
- 2 Sets of 2mm to 2mm Banana Cable
- 2 Sets of 2mm Crocodile Cable
- 2 Sets of connecting plug 4mm to 2mm
- USB A Male to USB mini B Male Cable for PC Communication and Charging
- 5 VDC Charging Adapter
- Carrying Bag
- Data Logging Software CD-mCAL

#### Directive Conformity

- Electromagnetic Compatibility Directive 2014/30/EU
- Low Voltage Directive 2014/68/EU

*(Applicable only for CE marked)*

### APPLICATIONS

- Loop check and calibration
- Calibration of transmitters and transducers
- Switch test and calibration
- Drift test of transmitters and transducers
## TECHNICAL SPECIFICATIONS

### Measurement Range

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<td>0-24.000 mA</td>
<td>0.001 mA</td>
<td>±0.02% of reading ± 2 counts</td>
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### General Specifications

- **Display Mode**: Measure only or source only
- **Max. Input Voltage**: 30 V DC
- **Temperature Coefficient**: 30 ppm
- **Input Impedance**: V, mV >1MΩ, mA =10 Ω
- **Response Time**: <100 ms
- **Load Impedance**: >10 KΩ for mV/V, <750 Ω for mA
- **Display Update Rate**: 10 readings/sec.
- **Data logging**: Logged data is stored in a user defined file in internal memory. Periodic logging: 150000 readings max.
- **Communication Interface**: USB 2.0
- **Display**: 2.4" TFT LCD, 262K Color, Graphical, 42.72 mm x 60.26 mm, 240x320 pixels, White LED backlight
- **Keys**: 6 Membrane keys
- **Special Features**: Loop Power Output 24V DC ±10% (24mA maximum), HART mA Loop Resistor 250 Ω ±20%, Step/Ramp functions: Automatic/Manual, A, X for measure & source
- **Charging Time**: <5 hours max.
- **Charger Supply**: 100-240 VAC, 50/60 Hz
- **Battery Life on Full Charge**: >20 hours max. for mA, mV, V measurement with minimum backlight brightness.
- **Battery Status Indication**: Battery symbol displayed with % power remaining
- **Display and Keys**: Calibration Certificate, User Guide, 1 Set of 2mm to 2mm Banana Cable, 1 Set of 2mm Crocodile Cable, 2 Sets of connecting plug 4mm to 2mm, USB A Male to USB mini B Male cable for PC Communication and Charging, 5 VDC Charging Adapter, Carrying Bag, Data Logging Software CD-mCAL

### APPLICATIONS

- Loop check and calibration
- Calibration of transmitters and transducers
- Switch test and calibration
- Drift test of transmitters and transducers
RS-12
Pt100 - Simulator

High precision simulator for the simulation of Pt100 resistance thermometers.

RS-12 covers general operating range of Pt100 with 12 calibration points.

Small in size, rugged and easy to use and it has been specially designed for field use.

It is used wherever measuring instruments or controlling systems have to be tested or calibrated with great precision.

The resistance values required for simulation are directly set in °C.

Accuracy of < 0.3 °C, quick check switch box and allows 2, 3 or 4 wire connections.

The output is a purely passive resistance, it can operate with all types of Pt100 measuring equipments, including the live systems using pulsed, or interrupted excitation current.

### TECHNICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Specification</th>
<th>Physical</th>
<th>Connection Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature Range</td>
<td>12 Set temperature values</td>
<td>-150°C to 0°C to 50°C to 80°C°C</td>
</tr>
<tr>
<td>Accuracy</td>
<td>&lt; 0.3 °C</td>
<td></td>
</tr>
<tr>
<td>Temperature Coefficient</td>
<td>20 ppm / °C</td>
<td></td>
</tr>
<tr>
<td>Allowable Excitation Current</td>
<td>0 to 15 millamps steady or intermittent</td>
<td></td>
</tr>
<tr>
<td>Dimension (in mm)</td>
<td>50 (H) x 135.4 (W) x 66.5 (D)</td>
<td></td>
</tr>
<tr>
<td>Enclosure Material</td>
<td>Extruded aluminum</td>
<td></td>
</tr>
<tr>
<td>Protection</td>
<td>IP40</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>&lt;400 grams</td>
<td></td>
</tr>
<tr>
<td>Terminals</td>
<td>4 nos, 4mm safety sockets</td>
<td></td>
</tr>
<tr>
<td>Environment</td>
<td>Operating Temperature</td>
<td>0 to 55 °C</td>
</tr>
<tr>
<td></td>
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</tbody>
</table>

### Example of application: Calibration of a controller

RS-12
Pt100 - Simulator

### APPLICATIONS

- To simulate RTD signal in all types of instruments, such as transmitters, controllers and data acquisition, process control, lab equipment etc.
- To simulate RTD signal in automation (PLC, DCS), data acquisition panels
- For maintenance & trouble shooting

### Accessories (Standard)

- Patch cords RED (1 end crocodile pin other end 4mm pin) - 2 nos.
- Patch cords BLACK (1 end crocodile pin other end 4mm pin) - 2 nos.
- Patch cords (PC-3 RED) (Both end 4mm pin) - 2 nos.
- Patch cords (PC-3 BLACK) (Both end 4mm pin) - 2 nos.

### Ordering Code

- Model
  - RS-12

- Comes with factory calibration certificate along with supply (Traceable to national/ international standard)
- Calibration certificate from NABL certified Lab (ISO: 17025) can be provided upon request - Please contact factory
CALIBRATION TRAINING FOR THE PROFESSIONAL

We provide customized Workshop and Training on Calibration for Industrial Professionals (Technicians and Engineers)

Masibus Calibration Training/Workshop is Structured to Enhance your Engineering Expertise and will Include:-

- ON Site & OFF Site Calibration Workshop, Online Training for Professional Outside India
- General Calibration Measurement and Understanding of Calibration Terms
- Training on Measurement of Temperature and Pressure Parameters
- Training Certificate after the Workshop is Completed

• Multi Function Test Bench
• Pressure Test Bench
• Temperature Test Bench
• Electrical Test Bench
## Masibus Automation And Instrumentation Pvt. Ltd.

<table>
<thead>
<tr>
<th>Location</th>
<th>Address</th>
<th>Phone Numbers</th>
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<tbody>
<tr>
<td>Gandhinagar</td>
<td>B-30, G.I.D.C. Electronic Estate, Sector - 25, Gandhinagar - 382 024, Gujarat, India</td>
<td>+91 9662042824, +91 9689937234, +91 9909949742, +91 9725154195</td>
</tr>
<tr>
<td>Goa</td>
<td>C-6, Phase 1-A, Verna Industrial Estate, Verna, Salcette - 403722, Goa, India</td>
<td>+91 9822135796, +91 9689937234, +91 9512003359</td>
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<tr>
<td>Sharjah</td>
<td>A2-102, SAIF Zone, PO Box 120145, Sharjah, UAE</td>
<td>+91 65574650, +91 9725154195</td>
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<tr>
<td>Bengaluru</td>
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<td>+91 8732971943, +91 9909949062</td>
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<td>Pune</td>
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<td>+91 9689937234</td>
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E-mail: sales@masibus.com  
Website: www.masibus.com

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## Sonepar India Pvt. Ltd.

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<th>Address</th>
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<tbody>
<tr>
<td>Gurgaon</td>
<td>Plot No. 229/239, Village - Kherki Daula, Sector 76, Gurugram, Haryana, 122004, India</td>
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<tr>
<td>Aurangabad</td>
<td>FP-42, Five Star Industrial Area, Shendra MDC, Aurangabad, Maharashtra, 431201, India</td>
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<tr>
<td>Kolkata</td>
<td>503, Block 4B, Ecospace Business Park, Newtown, Rajarhat, Kolkata, West Bengal, 700160, India</td>
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<tr>
<td>Panchkula</td>
<td>Plot No. 263, Industrial Area, Phase-II, Panchkula, Haryana, 134113, India</td>
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<td>Chennai</td>
<td>Plot No. 1, Gokul Garden, Melnallathur, Thiruvallur, Chennai, Tamil Nadu, 602002, India</td>
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<tr>
<td>Bhubaneshwar</td>
<td>Plot No. 443, 1st Floor, Saheed Nagar, Bhubaneshwar, Odisha, 751007, India</td>
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</table>

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Website: www.soneparindia.com