WENS30C Loop Calibrator

Instruction Sheet

Introduction
The WENS30C Loop Calibrator is a compact sourcing and measuring tool. The Calibrator tests current loops of 0-24mA or 4-20mA and measures dc voltage to 200V. It comes with a set of alligator-clip test leads, a 9V alkaline battery, and this Instruction Sheet.

⚠️ Warnings and Cautions
To avoid electric shock, injury, or damage to the Calibrator:

- Use the Calibrator only as described in this Instruction Sheet or the protection provided by the Calibrator may be impaired.
- Do not use the Calibrator around explosive gas, vapor, or dust.
- Inspect the Calibrator before use. Do not use it if appears damaged.
- Check the test leads for continuity, damaged insulation, or exposed metal. Replace damaged test leads.
- Never apply more than 30V between any two terminals, or between any terminal and earth ground.
- Use the proper terminals, mode, and range for your measuring or sourcing application.
- To prevent damage to the unit under test, put the Calibrator in the correct mode before connecting the test leads.
- When making connections, connect the COM test lead before the live lead; when disconnecting, disconnect the live lead before the COM lead.
- Never use the Calibrator with the case open.
- Make sure the battery door is closed before you use the Calibrator.
● Replace the battery as soon as the + symbol appears to avoid false readings that can lead to electric shock.

● Remove test leads from the Calibrator before opening the case or battery door.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Earth ground]</td>
<td>Earth ground</td>
</tr>
<tr>
<td>![Caution]</td>
<td>Caution : Important information. Refer to instruction sheet.</td>
</tr>
<tr>
<td>![Double insulated]</td>
<td>Double insulated</td>
</tr>
<tr>
<td>![Battery]</td>
<td>Battery</td>
</tr>
<tr>
<td>![Conforms to European union requirements]</td>
<td>Conforms to European union requirements</td>
</tr>
<tr>
<td>![Direct current]</td>
<td>Direct current</td>
</tr>
</tbody>
</table>

### Push button Functions

<table>
<thead>
<tr>
<th>Push button</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="power_button" alt="Power ON or OFF button." /></td>
<td>Power ON or OFF button.</td>
</tr>
</tbody>
</table>
| ![Press to step through modes:](mode_button) | Press to step through modes:  
|  - SOURCE mA, V  |  - SIMULATE mA  |  - LOOP POWER (24V)  |  - MEASURE mA, V |
| ![Turn to increase or decrease current output.](current_adjust_button) | Turn \(\bigcirc\) to increase or decrease current output.  
| | Current output can be adjusted at a resolution of \(1\mu A\) or \(100\mu A\).  
| |  - To adjust the current in \(1\mu A\) steps, simply turn the knob.  
| |  - To adjust the current in \(200\mu A\) steps, push in and turn the knob. |
| ![Press 25% to step the current up 25% of full scale.](25_percent_button) | Press \(25\%\) to step the current up 25% of full scale (20mA).  
| | At full scale, press \(25\%\) to step the current down 25% of full scale. |
| ![Press RAMP simultaneously to enter the Auto Ramp mode and select a ramp form.](ramp_button) | Press \(RAMP\) simultaneously to enter the Auto Ramp mode and select a ramp form.  
| | A continuously supplied or controlled mA ramping signal is produced in one of three ramp forms.  
| | \(\bigtriangleup\) (slow), \(\bigtriangleup\) (fast), or \(\bigtriangledown\) (step) identifies the selected ramp form. |
Using the mA Sourcing (Output) Modes

The Calibrator outputs current for calibrating and testing 0 to 24mA and 4 to 20mA current loops and instruments.

In SOURCE mode, the Calibrator supplies the current.

In SIMULATE mode, the Calibrator simulates a 2-wire transmitter in an externally-powered current loop.

Changing the mA Output Span

The Calibrator has two mA output spans:

- 4mA to 20mA (0% to 100%) [default]
- 0mA to 24mA (-25% to 125%) [optional]

Sourcing mA

Use SOURCE mode to supply current to a passive circuit.

A path must exist for current to flow between the + and COM terminals.

Otherwise the display indicates an overload (OL) when you set an output value.
Simulating a Transmitter

When simulating the operation of a transmitter, the Calibrator regulates the loop current to a known value selected by you. A 12V to 28 V loop supply must be available. Insert the test leads as shown below.

Auto Ramping the mA Output

Auto ramping allows you to continuously apply a varying current from the Calibrator to a passive (sourcing) or active (simulate) loop. Your hands remain free to rest the transmitter’s response.

Press to enter the Auto Ramp mode and step to a ramp type.

The Calibrator applies or controls a continuously repeating mA signal over a 0-20mA or a 4-20mA span in one of three ramp types:

- SLOW ( ) 0% to 100% to 0% smooth ramp over 40 sec.
- FAST ( ) 0% to 100% to 0% smooth ramp over 15 sec.
- STEP ( ) 0% to 100% to 0% stair-ramp in 25% steps, pausing 5 sec at each step.
Measuring dc mA with LOOP POWER

Caution

To prevent damage to the unit under test, ensure that the Calibrator is in the correct mode before connecting the test leads.

Loop power provide + 24V to power a transmitter and to read loop current simultaneously.

To measure dc mA with LOOP POWER:

1. Press \[ \text{MODE} \] to step to LOOP POWER mode.
2. \text{MEASURE mA} and LOOP POWER are displayed.
3. Touch test lead probes to the circuit across the load or power source as shown below.

To exit LOOP POWER, change measurement mode.

Measuring dc mA

Caution

To prevent damage to the unit under test, ensure that the Calibrator is in the correct mode before connecting the test leads.

To measure dc mA:

1. Press \[ \text{MODE} \] to step to \text{MEASURE} mode.
   \text{MEASURE mA} is displayed.
2. Touch test lead probes to the circuit across the load or power source as shown below.
Measuring dc Volts

Caution

To prevent damage to the unit under test, ensure that the Calibrator is in the correct mode before connecting the test leads.

To measure dc Volts:

1. Press \textbf{MODE} to step to \textbf{MEASURE} mode.

\textbf{MEASURE V} is displayed.

2. Touch test lead probes across the load or power source.

\textbf{MEASURE VOLTAGE MODE}

\begin{center}
\begin{tabular}{c}
\textbf{Press until MEASURE V dc is displayed.}
\end{tabular}
\end{center}

Maintenance

Caution

To avoid electric shock, personal injury, or damage to the Calibrator:

- Do not service this product other than as described in this Instruction Sheet unless you are a qualified technician and have the required equipment and service information.
- Remove any input signals prior to removing test leads and opening case.
- When servicing the Calibrator, use only specified replacement parts.
- Do not allow water to get in the case.

In Case of Difficulty

- Make sure you are using the Calibrator as described in this Instruction Sheet.
- Check the battery and test leads. Replace as needed.

If the Calibrator is under warranty, refer to the warranty statement for warranty terms, conditions, and product return information.

If the warranty has lapsed, the Calibrator will be repaired and returned for a fixed fee.

Cleaning

Periodically wipe the case with a damp cloth and detergent; do not use abrasives or solvents.

Calibration

Calibrate the Calibrator once a year to ensure that it performs according to its specifications.
Replacing the Battery

**Warning**

To avoid false readings, which could lead to electric shock or injury, replace the battery as soon as (low battery indicator) appears on the display.

Use only a single 9V battery, properly installed, to power the Calibrator.

The Calibrator uses a single 9V, alkaline battery (ANSI/NEDA 1604A or IEC 6LR61). To replace the battery:

1. Press \( \text{POWER} \) to turn the Calibrator OFF.
2. Remove the test leads from the terminals.
3. Remove the holster.
4. Lift off the bottom case of the Calibrator.
5. Remove the battery.
6. Insert the replacement battery and restore the battery door. Make sure it is securely in place.

### Specification

#### General Specifications

- 4 1/2 digit Large display and simple. Quick-click interface for easy one-handed operation.
- Simultaneous mA and % read out for quick, easy interpretation of readings.
- mA accuracy of 0.025%.
- 1\( \mu \)A resolution for mA source, simulate and measures.
- Push button 25% steps for fast, easy linearity checks.
- 24 Volt internal loop supply, so you can power and read a transmitter at the same time with carry a DMM.
- Innovation output adjustment dial with 1\( \mu \)A and 100\( \mu \)A resolution.
- Storage temperature: -40 °C to 60°C
- Operating temperature: -10 °C to 55°C
- Power requirements:
  - Single 9V battery (ANSI/NEDA 1604A or IEC 6LR61)
  - Battery life (typical): Approx 18 hours
  - Size: 88mm (W) × 178mm (L) × 33mm (H)
    - [3.5 in (W) × 7 in (L) × 1.3 in (H)]
  - Weight: 300g with holster
**Electrical Specification**

### SOURCE / DC CURRENT

<table>
<thead>
<tr>
<th>Range</th>
<th>Accuracy</th>
<th>Drive capability</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 24mA (optional)</td>
<td>±(0.025% rdg + 2dgts) cu</td>
<td>1000Ω / 24mA</td>
</tr>
<tr>
<td>4 - 20mA (default)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### SOURCE / DC VOLTAGE

<table>
<thead>
<tr>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>2V</td>
<td>100mV</td>
<td>±(0.025% rdg + 2dgts)</td>
</tr>
<tr>
<td>20V</td>
<td>1mV</td>
<td></td>
</tr>
</tbody>
</table>

**TX SIMULATOR**

* 2wire transmitter simulation: External excitation voltage, 3V min, 50V max.

* The current sink levels are adjustable with accuracies as in the mA source.

**OUTPUT RAMP**

* Current Ramp: 4 to 20 or 0 to 24 on all ranges.

* Voltage Ramp: 0 to 20 on all ranges.

* Ramp times: 5sec, 20sec, 40sec (3 ramp type).

* Ramp operation is also available in TX SIMULATOR function.

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**MEASURE / DC VOLTAGE (auto)**

<table>
<thead>
<tr>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy</th>
<th>Overload Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>200mA</td>
<td>10mA</td>
<td>±(0.025% rdg + 2dgts)</td>
<td>500V DC or AC peak with 10 Seconds</td>
</tr>
<tr>
<td>2V</td>
<td>100mA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20V</td>
<td>1mA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>200V</td>
<td>10mA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**MEASURE / DC CURRENT (auto)**

<table>
<thead>
<tr>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy</th>
<th>Overload Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>2mA</td>
<td>0.1mA</td>
<td>±(0.025% rdg + 2dgts)</td>
<td>250V/200mA fused</td>
</tr>
<tr>
<td>20mA</td>
<td>1mA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>