

# Sound Calibrator Model SC-1

## GENERAL DESCRIPTION



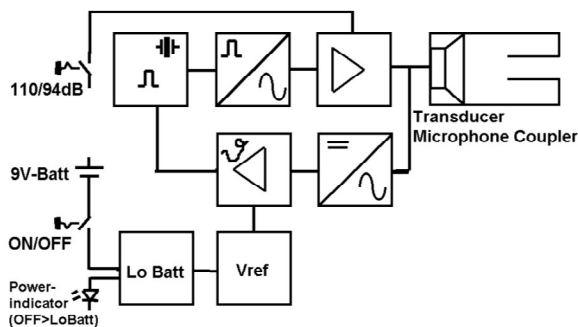
The SC-1 sound calibrator is a one frequency dual amplitude, self contained field calibrator that quickly and also precisely verifies the accuracy and the sensitivity of microphones. The unit generates a 1kHz reference tone at 94 and 110 dB SPL. The calibrator uses a single 9 Volt battery.

The SC-1 consists of an amplitude switchable constant frequency oscillator, a transducer and a microphone coupler. The coupler accepts a large variety of microphones.

Separate 1/2", 1/4" and 8mm as well as custom size adapters are available.

## THEORY OF OPERATION

The coupler cavity of the SC-1 Calibrator is designed to accept a large variety of microphones. The proper adapter must be used.



The above picture outlines the functional principle of the SC-1. The oscillator is a crystal stabilized rectwave oscillator followed by a sine converter. Automatic gain control and temperature compensation are built-in. The

oscillator output drives the transducer and is converted to sound.

The internal battery check circuitry compares the battery voltage to a reference. If the battery is too low for proper operation the power control LED will be switched off. Sound production is continued without amplitude stabilization.

1. Place this adapter over the microphone, being sure the microphone fits down inside the adapter and rests on the lower rim.

*Note: If the calibrator has recently been moved from one area to another of substantially differing temperature, it is advisable to wait a minimum of 30 minutes before attempting to calibrate.*

2. Carefully lower calibrator over microphone and adaptor. Be sure calibrator is seated squarely with adaptor and microphone or significant errors may result.

*Caution: Rapid lowering or withdrawal of the calibrator may damage the microphone or the transducer because of the rapid change in pressure on the diaphragms.*

3. The SC-1 uses push-on-off latching switches. Push ON-OFF switch to the depressed position to turn on. Allow up to 3 seconds for it to stabilize.

Look at the red indicator LED. If no light is apparent sound production is without amplitude stabilisation or off. Refer to section on battery replacement.

4. Select desired amplitude. The "in"-position correspond to 94dB the "out"-position to 110dB. *Note: a: Background noise must be more than 20dB below calibrator output.*

*b: Calibrate at or near full scale deflection of SPL Meter.*

5. Verify sound level meter accuracy by comparing it's reading with the calibrator's output. If altitude or temperature corrections are necessary refer to the following example.

6. After calibration is complete, slowly remove the calibrator and switch it off.

## CONTACT

iSEMcon LLC  
PO Box 607  
Sylvania, OH 43560-0607  
Phone 1-877-309-1002  
Fax 419-517-5007  
sales@iSEMcon.com

iSEMcon GmbH  
Alexanderstr. 66  
68519 Viernheim, Germany  
Phone +49 (0) 6204 911 24 91  
Fax +49 (0) 6204 911 24 90  
www.iSEMcon.com

## ATMOSPHERIC PRESSURE CORRECTION

Example1: Assume you're calibrating a microphone at barometric pressure of 600mm Hg, corresponding to an elevation of about 7000 feet . With the calibrator set to 110dB the sound meter reading should be 110dB + 1.2 dB (altitude effect) or 111.2dB. (see you calibration data for individual diagram (data).

## BATTERY CHECK AND REPLACEMENT

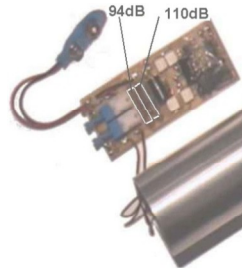
Operator decisions are needed but simple to determine condition of the battery. If the battery is to low as to affect the calibration, a low battery detector circuit disables the power control lamp.

To change the battery, first be sure the calibrator is turned off. Then remove the two screws on the face plate of the calibrator. Remove the face plate exposing the circuitry and the battery. Pull out the weak battery and unsnap the battery clip. Replace with a fresh battery, snap on the clip. Carefully drop the battery in the calibrator housing and replace the face plate so as not to pinch any wires.

## CALIBRATING THE CALIBRATOR

The calibrator should be periodically checked with laboratory standards.

The following picture shows the withdrawn SC-1 circuitry. The control potentiometers are indicated on the picture.



## ORDER INFORMATION

Calibrator SC-1

Please order adapter separately.

CA-1/2" microphone adapter

CA-1/4" microphone adapter

CA-8mm

CA-cust .....custom version - specify diameter and mic type

## SPECIFICATIONS

*Values for: 4mA CCP; 21V excitation voltage; 23° Celsius*

### PERFORMANCE

|  |                 |
|--|-----------------|
| Output frequency                             | 1kHz ± 0.2%     |
| Output amplitude selectable                  | 94dB / 110dB    |
| Accuracy 20°C [68°F] and 1013mbar [760mm Hg] | ± 0.5dB         |
| Temperature drift Coefficient                | -0.08 to -0.012 |
| Temperature correction                       | See note        |
| Altitude effects                             | See diagram     |
| (Low Bat control)                            |                 |

### ELECTRICAL

|               |             |
|---------------|-------------|
| Power supply: | 9V standard |
|---------------|-------------|

### ENVIRONMENTAL

|                          |   |
|--------------------------|---|
| Operating temp. range    | -5°C to 55°C [40°F to 130°F]                        |
| Storage temp. range      | -20°C to 65°C<br>[0 °F to 150 °F] (battery removed) |
| Operating Humidity Range | 0...95%r.H.   |

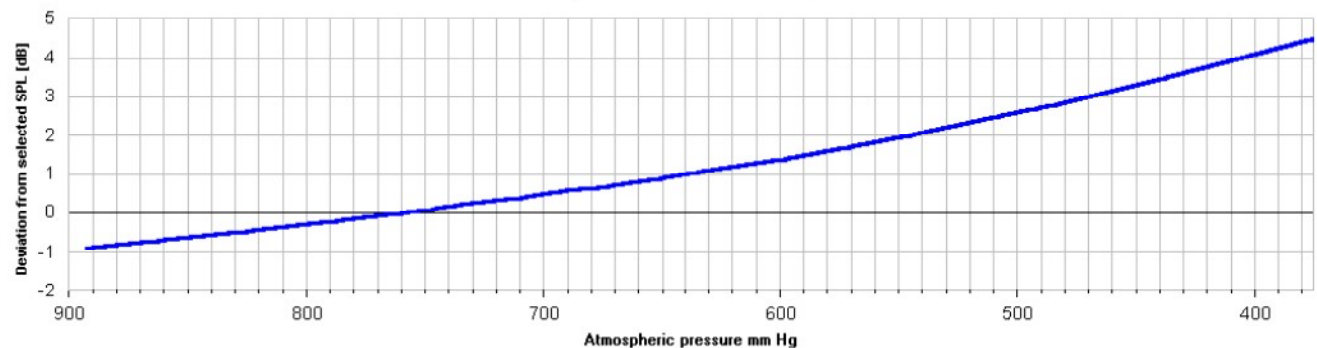
### PHYSICAL

|                  |  |
|------------------|--|
| Housing Material | Stainless Steel                        |
| Sealing          | none                                   |
| Dimensions       | Ø 1.57 1/4" (40mm)<br>x 5 1/4" (132mm) |

### CONFORMITY

CLASS 2 Calibrator

Correction chart



Sound-Pressure-Level of the Calibrator decreases about 0.1dB per 10°C [18°F] temperature change. e.g.: at 20°C [68°F] measured SPL is about 109.4dB at 40°C [104°F] SPL is about 109.2 dB.

# Sample data

|   |   |   |                  |
|---|---|---|------------------|
|  |   | <b>iSEMcon GmbH</b><br>Alexanderstr.66<br>D-68519 Viernheim,Germany<br>Fon: +49 (0)6204 911 24 91<br>Fax: +49 (0)6204 911 24 90<br>Url: www.iSEMcon.com<br>email: sales@iSEMcon.com |                  |
|   |   | <b>Calibration Chart</b><br><b>Factory certificate</b>  |                  |
|   |   | <b>1005001– 14.05.2010</b>  |                  |
| Measurement unit  | Name  | Sound Calibrator SC-1   |                  |
|   | Manufacturer Id-No.   | 1002003   |                  |
|   | Customer Id No.   | /   |                  |
| Environmental Conditions  | Temperature   | 21,6  | °C               |
|   | Pressure  | 1015  | hPa              |
|   | Humidity  | 31  | r.H.             |
| Calibration reference*  | Name  | Schallkalibrator Quest QC-22<br>Ser-No. J 2060023   |                  |
|   | Last calibration date   | 04.03.2010  |                  |
| Calibration procedure   | Comparative measurement<br>Average of 3 measurements in 3 minutes |   |                  |
| Reading /<br>Reference Frequency  | Reference Level *   | Level before<br>Calibration   | Level calibrated |
|   | 94 dB SPL / 1 kHz   | -   | 94.0 dB          |
|   | 110 dB SPL / 1kHz   | -   | 110.0 dB         |
| Customer  |   |   |                  |
| 14.05.2010  |   | Wolfgang Frank  |                  |
| Date  | Exam  | Signature   |                  |

# Pressure correction chart

