2017

LCD Bass Meter SE

User Manual

Portable multi-purpose spectrum analyser

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General Information

The LCD BASS METER portable noise meter is intended for measuring the noise level and sound pressure at the low frequency. The source of the measured signal can be provided by both industrial equipment and acoustic systems. The main advantage of this noise meter is complete autonomy of work. For carrying out measurements you won't need a computer; all data is processed and calculated in the device and depicted on its display. If it is necessary to receive more detailed information, such as spectrum or signal waveform, the device can be connected to a PC using USB port. Using the NEXT-LAB SPL Sensor pressure transducer allows receiving results with high accuracy of 0.1 dB. The device has Lab-Bus digital bus port, to which the pressure sensor, microphone or power sensor can be connected. When user at the beginning purchases, for example, a set for measuring sound pressure, in future they can supplement it with the microphone for measuring AFC or with the power sensor for measuring current and voltage.

Ergonomics

The LCD BASS METER device is performed as the main unit and detachable sensor with vacuum suction cups for affixing in to any smooth surface, for example, glass. The the cable between the main unit and the sensor can be several meters long, which allows a user to be at some distance from the spot of measurement. At the main unit there are controls and two-line LCD display with micro-light for comfortable use of the device indoors or in the passenger compartment of a car. The device can operate on batteries, which should be inserted into the case, or from USB. The USB port is intended for power supply, updating the microcode and transferring data to a PC. The case of the device is made of the shockproof plastic material.

Package Contents

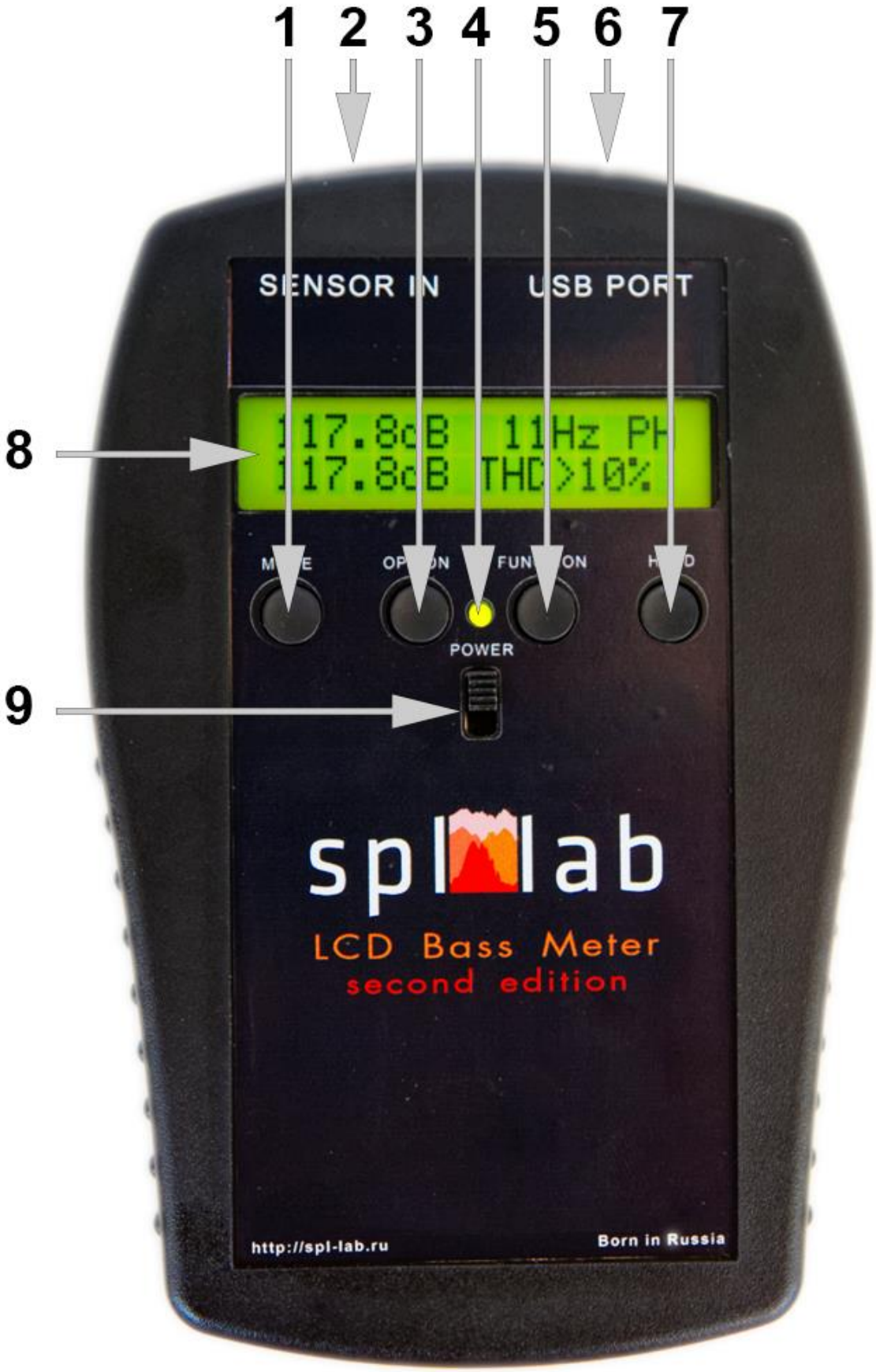
- Main unit
- USB connection cable for charging and connecting the device to a PC
- Spl-Lab Measuring Center software for Windows
- Audio-CD with audio tracks for tuning (sine, sweep-tones, noise)

Working with the device

Important safety information:

- The manufacturer does not bear responsibility for damage, caused directly or indirectly, as a result of improper use of device.
- Before using the device, examine its case for cracks and splits, because any depressurization of the device will result in its breakage.
- To avoid the risk of electric shock all the connector cables should not have insulation defects.
- Avoid measuring load beyond the maximum limit.
- All operations of connecting and disconnecting connection cables should be performed with equipment switched off.
- Do not use or store the device in the areas with high humidity or heat, as well as, close to the devices, generating strong magnetic field.
- During the preventive maintenance of the device do not use the synthetic detergents, do not apply solvents. Using wet wipes is more preferable.
- Before starting the device and a system on the whole, ensure that all the connection cables are switched correctly.
- Do not use the device at temperatures below 0 C and above 40 C.

Identifying the functional parts of the device:



No.	Element	Assignment
1	Button 1	for switching the device operation modes
2	Lab-Bus port	input jack for connecting the external sensors
3	Button 2	the button assignment depends on the mode
4	Power indicator	three-coloured LED for indicating status of the device
5	Button 3	the button assignment depends on the mode
6	USB port	slot for connecting device to the PC or charger
7	Button 4	the button assignment depends on the mode
8	Display	text display with automatic dimming of display backlight
9	Feed switch	the slide switch for switching the device on/off

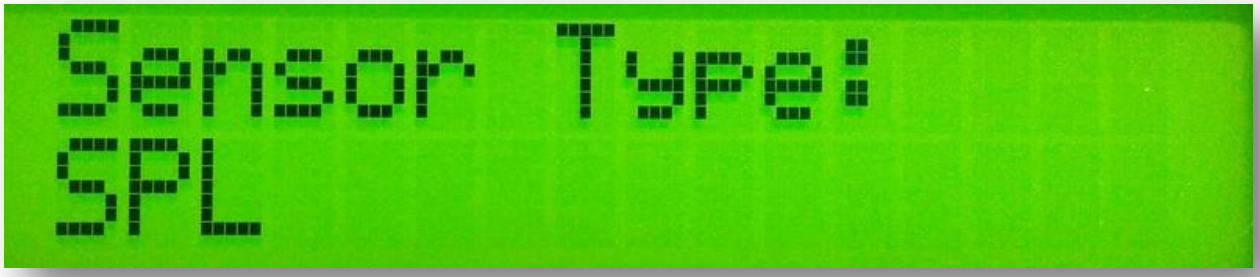
Device power supply:

The device has battery compartment, which holds four AA type batteries/rechargeable batteries. The device runtime from batteries depends on the intensity of use and the type of sensors connected. The device can be also powered through USB, using a charger or PC. Use the LED-indicator for estimating a status of the device (according to the table below):

	Green	Orange	Red
Glows continuously	The device is on and operates from the battery, battery charge is normal.	The device is on and operates from external source of power, connected via USB.	The device is off and connected to external source of power via USB.
Blinks	The device is on and operates from the battery, battery charge is low. **Batteries should be replaced!**		

Starting the work and configuring the device

Connect the sensor to Lab-Bus port. Switch the device on using the slide switch. After it is switched on you will enter the configuration mode - **CFG MODE**. The name shows up on the display immediately before entering a mode.



Use **button 2** for switching between menu entries. Use **buttons 3** and **4** for changing the value of selected menu entry.

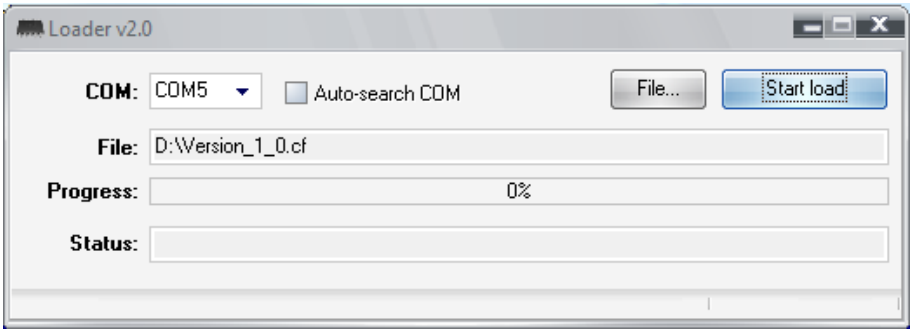
- **Sensor Type** – selecting the type of sensor, connected to Lab-Bus port
- **Lighting** – enabling/disabling backlight and setting automatic display backlight dimming in seconds. Backlight goes off after the defined period of time and switches on when any button is pressed. **Please, pay attention that running time decreases, when the display backlight is used.** It is recommended to use an automatic backlight dimming option for saving the battery.
- **Calibration –** selecting the type of calibrations, used for measuring in SPL и AVG modes: **"Classic"** or **"Magnum"**. The measurement results will differ depending on the selected calibrations.

Connecting to PC via the USB port

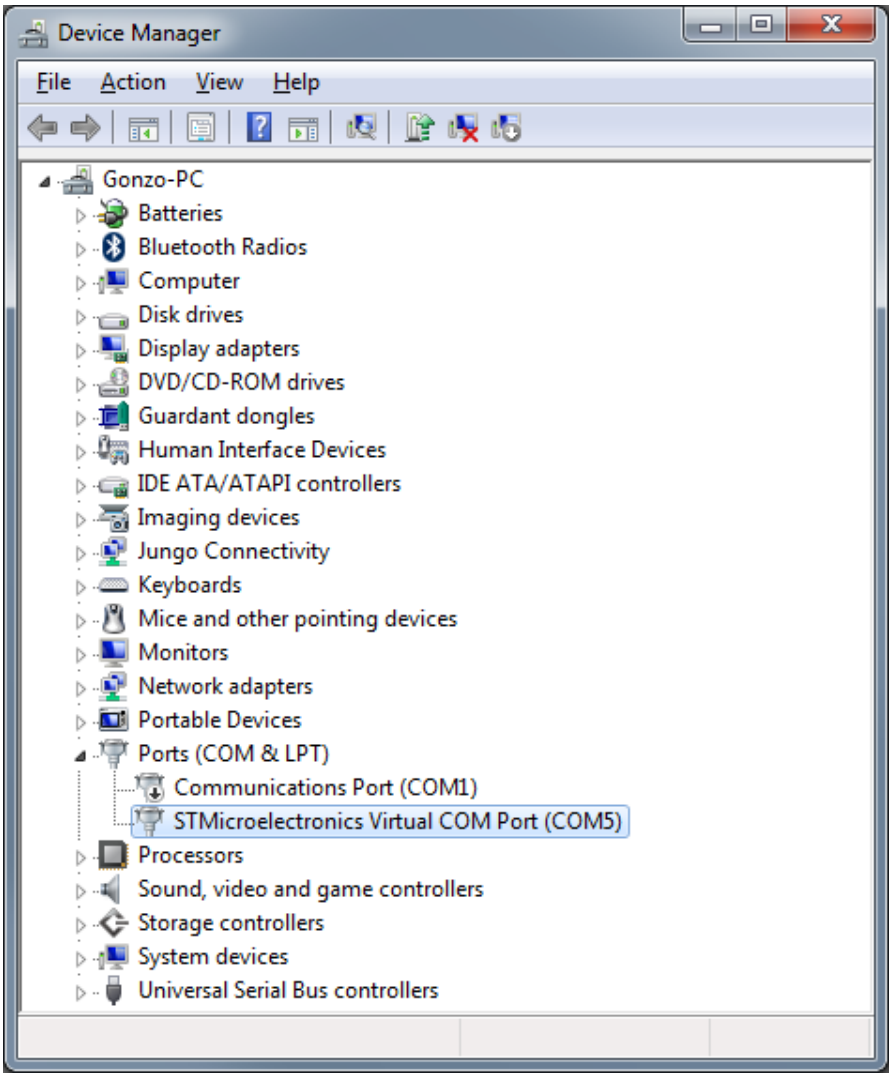
Switch the device on and wait until the **CFG MODE** mode is loaded. Connect the device to a PC using USB port. Install drivers from the CD, which is included into the delivery set, or download them from Support section at Spl-Lab web site **www.spl-lab.ru.** Install the drivers and start Spl-Lab Measuring Center for connecting with the device. After device is successfully connected to the PC, the display of the device will show **Connected to PC**.

Firmware upgrade using PC

- Download the latest firmware version from *Support* section of the www.spl-lab.ru web-site.
- Connect the device to a PC using USB cable.
- Unpack the archive with firmware to hard drive.
- Run **Loader.exe** and select firmware file.

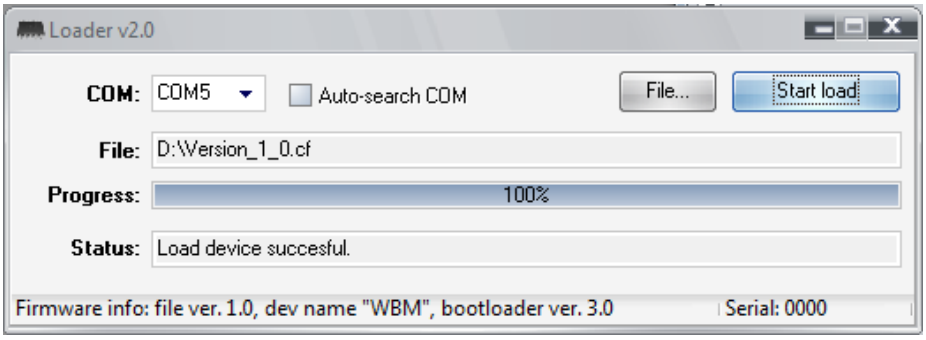


- Set a number of COM Port according to Port in Device Manager **(My Computer – Device Manager – LPT and COM Ports– Virtual COM Port)**



- Switch the device on and within **3 seconds press** "**Start load**" in the program.

- Wait until firmware is successfully downloaded onto the device.



Operation Modes

There are several operation modes in the LCD BASS METER. The name shows up on the display immediately before entering a mode. Modes are changed cyclically using **button 1**. Apart from the general operation modes there are measuring modes. Each measuring mode has unique algorithm for conducting measurements. The measuring mode will be disabled in case the required equipment is unavailable.

- **"CFG MODE"** is the configuration mode. The device automatically enters this mode after switched on.
- **"SPL MODE"** is the mode used for measuring the peak value of the sound pressure level for signals with frequency ranging from 10 to 120 Hz with resolution of 1 Hz. In this mode the waveform, spectrum, level and distortion of the measured signal are reflected. The mode works with **Next-Lab SPL Sensor.**
- **"AVG MODE"** is the mode used for measuring time-average peak value of the sound pressure level of the signal with frequency ranging from 10 to 120 Hz with resolution of 2 Hz. In this mode the level of the measured signal is reflected. The mode works with **Next-Lab SPL Sensor.**
- **"Connected to PC"** is the mode switches on automatically after device establishes connection with a PC via USB or Wireless network. The type of current connection is displayed. Managing the device is unavailable in this mode. For exiting the mode disable the connection on the PC.

SPL Measuring Mode

The SPL mode is intended for measuring the sound pressure level of the low frequency sound signals. The length of the analysed part of the signal equals to one second. The resultant value of the sound pressure level is calculated from several spectral components for each analysed part of the signal separately.

- **“157.9 dB”** is a section displaying the main result
- **“45Hz”** is a section displaying the frequency
- **“PH”**– the indicator that is responsible for enabling/disabling the Peak hold mode. Use the **button 4** to enable/disable the Peak hold mode. The main result section holds the maximum amplitude reached during the entire time of measurement, and in the frequency area - the frequency at which the maximum amplitude value was reached. Collected data is reset by pressing **button 4** twice.
- **“146.2dB”** - is a section displaying the current result (not being displayed if the Peak Hold **(PH**) mode is not enabled)
- **“THD=2.3%”** is the harmonic distortion coefficient value of the signal

AVG Measuring Mode

The AVG mode is intended for measuring the time-average sound pressure level of the low frequency sound signals. The length of the analysed part of the signal equals to 1/2 second. Current value of the sound pressure level is calculated from several spectral components separately for each analysed part of the signal. The resultant value is arithmetic average of peak figures, selected within the number of analysable parts of signal, specified in the **"P"** parameter.

- **"139.7 dB"** is a section displaying the main result
- **"50 Hz"** is a section displaying current frequency
- **"P1"** is the defined period value. For changing the period, use **button 2**.
- **"120.3 dB"** is a section displaying the current result
- **"T:None"** indicates duration of the current measurement in seconds. For starting/stopping the measurement press **button 4**. Before starting measurement the 5 seconds long countdown is provided.

Description of the CD tracks

The CD included in the Spl-Lab equipment distribution kit alongside with software contains specialised audio tracks with test signals for adjusting a system. Consider that these tracks are recorded not in the file form, but as tracks in Audio-CD format. For playing back the tracks from the CD use specialised software or CD player. It is possible that some CD player models will not read the audio content of the CD. In such case or if it is more convenient for you to use the audio files, download the archive with test signals from **"Support"** at Spl-Lab web site. Table with track description below:

No. of track	**Contents**
Track 1	Pink noise 20-20 000 Hz
Track 2	Pink noise 40-60 Hz
Track 3	Pink noise 60-80 Hz
Track 4	Pink noise 80-100 Hz
Track 5	Pink noise 100-120 Hz
Track 6	Pink noise 120-140 Hz
Track 7	Pink noise 140-160 Hz
Track 8	Pink noise 160-180 Hz
Track 9	Sweep-tone 30-20 Hz Level – 0 dB.
Track 10	Sweep-tone 35-25 Hz Level – 0 dB.
Track 11	Sweep-tone 40-30 Hz Level – 0 dB.
Track 12	Sweep-tone 45-35 Hz Level – 0 dB.
Track 13	Sweep-tone 50-40 Hz Level – 0 dB.
Track 14	Sweep-tone 55-45 Hz Level – 0 dB.
Track 15	Sweep-tone 60-50 Hz Level – 0 dB.
Track 16	Sweep-tone 65-55 Hz Level – 0 dB.
Track 17	Sweep-tone 70-60 Hz Level – 0 dB.
Track 18	Sweep-tone 75-65 Hz Level – 0 dB.
Track 19	Sweep-tone 80-70 Hz Level – 0 dB.
Track 20-80	Sine signal. The number of track corresponds to the signal frequency. Level – 0 dB.
Track 81	Sweep-tone: Sweep-tone 20-20,000 Hz Level – 0 dB.
Track 82	Sine signal with frequency of 100 Hz
Track 83	Sine signal with frequency of 200 Hz

Track 84	Sine signal with frequency of 1,000 Hz
Track 85	Sine signal with frequency of 2,000 Hz