

FREQUENCY SOUND LEVEL RECORDER-LIMITER LRF-04

- Frequency-Filter Sound Pressure Level limiter based on the measurement of SPL
- Control by emission Sound Pressure Level or reception SPL (insulation)
- 40 dB correction range (attenuation)
- It registers acoustical parameters like L_{Aeq} , $L_{Aeq1'_{max}}$, $L_{Aeq1'_{min}}$, L_{Fmax} , and percentiles (interval and sessions)
- It registers all the occurred incidents: Disconnection from the mains, Sensor tampering
- It can be completely sealed
- Adaptable to any kind of regulation
- Internal Battery
- Data retrieval by LCD Screen, printer, serial connection with PC and modem.
- Internal continuous self-verification system
- Several predictive control algorithms
- Massive Data Storage for periods longer than 1 month

The **LRF-04** frequency sound level recorder-limiter measures, displays, records and controls the sound pressure level in the establishment where it is installed. The **LRF-04** is inserted into the reproduction chain, between the mixing desk and the crossover, intervening in the entire sound chain.

The **LRF-04** automatically corrects excesses in the musical signal level of up to 40 dB. If these 40 dB are exceeded, the **LRF-04** penalises with a 60 dB attenuation during a programmable time interval. The wide dynamic attenuation range provides the user of the hi-fi set with considerable room for manoeuvre in which the **LRF-04** corrects the signal level excesses without restrictive attenuations. The **LRF-04** is equipped with different predictive reply algorithms for this function, ranging from the most stable, based on the Leq_{10s} parameter (recommended) to the most restrictive, based on Leq_{125ms} .

The **LRF-04** functions according to the sound levels measured in the establishment by means of a sensor designed on the basis of the latest technology developed by **CESVA** in the field of sound measurement and/or according to the sound pressure levels in the dwelling next door to the establishment, calculated on the basis of the levels measured by the sensor by octave bands (centred on 31.5 Hz, 63 Hz, 125 Hz, 250 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz and 8 kHz) and to the existing insulation levels by octave bands between the establishment and the dwelling. This spectral function allows the user to obtain the maximum sound pressure level in the establishment without exceeding the permitted sound level limit in adjacent buildings.

The **LRF-04** is also equipped with a recording function that allows the user to store information concerning measured sound levels in the establishment and concerning incidents that occur (tampering with the equipment) during a minimum period of one month (Leq time over 2 minutes). The **LRF-04** allows you to

programme the periodicity of information storage (from 2 min. to 1 h. in 1-min. steps). The information for each session is also stored, allowing you to demonstrate the sound levels generated by your activity to the authorities. The stored information can be retrieved either directly from the **LRF-04**, by displaying it on the LCD screen, or by means of a printer connected to the **LRF-04** parallel port. The information can also be transferred to a PC via a serial port or modem.

The **LRF-04** is equipped with an internal battery that allows it to continue working when disconnected from the mains or in the event of a power cut. When the **LRF-04** is working from a battery, it attenuates 60 dB. The battery lasts for one day. Before the battery runs out, the **LRF-04** records the day and time, storing a record of the last 10 occasions on which this occurred. When the battery has run out, the **LRF-04** turns off automatically and attenuates 60 dB until the next time it is connected to the mains. The stored information is not lost. When the unit is connected to the mains once more, the **LRF-04** continues to function as normal.

A luminous external display can be connected to the **LRF-04**, allowing you to observe from anywhere in the establishment and in real time the measured sound pressure level together with the attenuation level applied by the **LRF-04**.

The **LRF-04** is equipped with an internal continuous self-verification system that allows you to detect and record possible tampering with both the measurement equipment and the musical chain.



Technical Specifications

Frequency Sound Level Recorder-Limiter LRF-04

INPUTS AND OUTPUTS

Audio Inputs and Outputs

Asymmetrical E/S Connectors (non-balanced):
RCA

Symmetrical E/S Connectors (balanced):

Input: XLR female
Output: XLR male

Input impedance:
100 k Ω

Output impedance:
100 Ω

Minimum output charge:
47 k Ω

Total harmonic distortion (THD):
< 80 dB

Absolute maximum input level:
 ± 18 V

Maximum input level without distortion:
 ± 14 V

Frequency response (± 0.5 dB)
20 to 20,000 Hz

Typical noise (20 – 20,000 Hz):
Balanced: 180 μ V
Non-Balanced: 130 μ V

DL-3E external display connection output

XLR with 3 contacts (male)

Modem connection output

DB-9 plug (male)

RS-232 serial connection output

DB-9 socket (female)

Connection with parallel printer output

DB-25 socket (female)

ATTENUATOR

Range of attenuation:
0 – 40 dB

Penalisation attenuation:
60 dB

Typical attenuation error:
0 dB

Maximum attenuation error (0 - 40 dB):
1 dB

SENSOR

Measurement range:
60 – 120 dB

Frequency range:
20 – 20,000 Hz

OCTAVE FILTERS

IEC-61260 (1995) standardised type
1 octave filters.

Central frequencies according to
ISO-266 (1975) recommendation:

The frequency margin comprises the octave bands centred in the frequencies: 31.5, 61, 125, 250, 500, 1000, 2000 and 4000, 8000 Hz and those cover the ones which are recommended for the description of sound insulation of buildings (preferential frequencies: 125, 250, 500, 1000, 2000, 4000 Hz).

DISPLAY

LCD Display

Backlit with 20 x 4 characters

External Display (Optional)

DL-3E external LEDs display: indicates, in real time, the sound pressure level in dBA and the LRF-04 attenuation in dB. The display updates every 2 seconds.

DIMENSIONS and WEIGHT

440x226x95 mm
2 units 19" rack
9 kg

MAINS FEED

220 V – 50-60 Hz

BATTERY FEED

With automatic recharge
Minimum battery duration: 24 h

MAXIMUM CONSUMPTION

25 W

STORAGE CAPACITY (It can be increased)

22 days (TLeq = 2 min)
34 days (TLeq = 3 min)
56 days (TLeq = 5 min)
22 months (TLeq = 1 h)

CESVA *instruments, s.l.*

reserves the right to change specifications and accessories without notice.

SUPPLIED ACCESSORIES

- Sensor LXM-8
- Cable CNOMX9
- **SFTL04** Software for PC

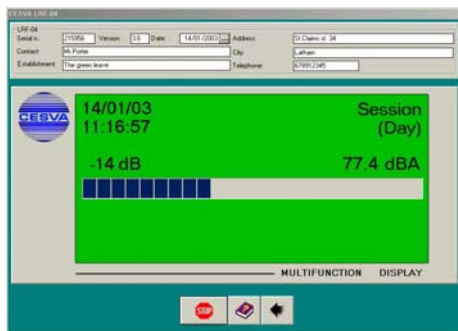
OPTIONAL ACCESSORIES

- | | |
|----------------|---------------------------------------|
| CB-5 | Sound Calibrator |
| DL-3E | External Display |
| ALIC-1 | Pincers to seal |
| PLOM-1 | Lead seal of $\varnothing 9$ mm (1kg) |
| ALAMB-1 | wire to seal (50 m roll) |

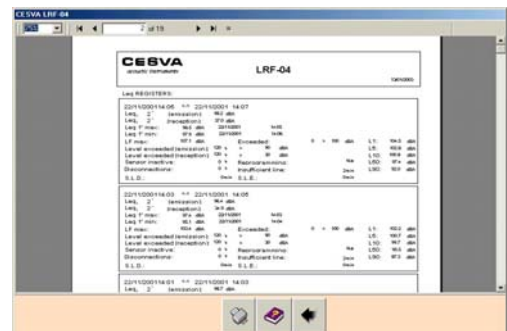
Software Windows® 9x/Me/2000/NT/XP For LRF-04

The LRF-04 is supplied with the software application that allows you to:

- Display data registered by LRF-04.
- Generate reports of these data
- Study in detail all the sound levels and incidences
- Acquire data via MODEM
- Display, in real time, the data measured by the LRF-04
- Program the LRF-04
- Erase the LRF-04 memory



Real time data acquisition by modem



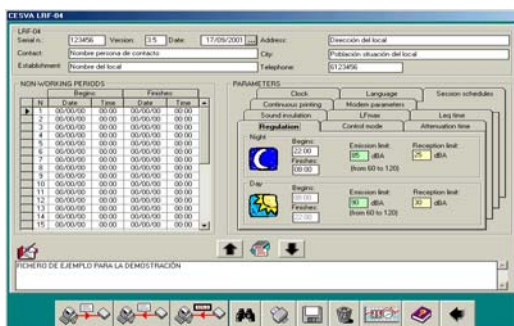
Generate a report



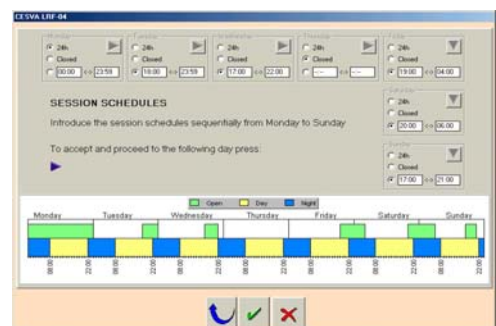
Graphical display of data
(sound levels and incidences)

Session	Date	Time	Level	LeqT	Max	Min	Stdev	Direction	Wind	Temp	Humid	Pressure
1	14/01/2003	11:20	14.00	77.4	115.0	35.0	10.0	180	1.00	12.0	65	1013.0
2	14/01/2003	11:25	14.00	77.4	115.0	35.0	10.0	180	1.00	12.0	65	1013.0
3	14/01/2003	11:30	14.00	77.4	115.0	35.0	10.0	180	1.00	12.0	65	1013.0
4	14/01/2003	11:35	14.00	77.4	115.0	35.0	10.0	180	1.00	12.0	65	1013.0
5	14/01/2003	11:40	14.00	77.4	115.0	35.0	10.0	180	1.00	12.0	65	1013.0
6	14/01/2003	11:45	14.00	77.4	115.0	35.0	10.0	180	1.00	12.0	65	1013.0
7	14/01/2003	11:50	14.00	77.4	115.0	35.0	10.0	180	1.00	12.0	65	1013.0
8	14/01/2003	11:55	14.00	77.4	115.0	35.0	10.0	180	1.00	12.0	65	1013.0
9	14/01/2003	12:00	14.00	77.4	115.0	35.0	10.0	180	1.00	12.0	65	1013.0
10	14/01/2003	12:05	14.00	77.4	115.0	35.0	10.0	180	1.00	12.0	65	1013.0
11	14/01/2003	12:10	14.00	77.4	115.0	35.0	10.0	180	1.00	12.0	65	1013.0
12	14/01/2003	12:15	14.00	77.4	115.0	35.0	10.0	180	1.00	12.0	65	1013.0
13	14/01/2003	12:20	14.00	77.4	115.0	35.0	10.0	180	1.00	12.0	65	1013.0
14	14/01/2003	12:25	14.00	77.4	115.0	35.0	10.0	180	1.00	12.0	65	1013.0
15	14/01/2003	12:30	14.00	77.4	115.0	35.0	10.0	180	1.00	12.0	65	1013.0
16	14/01/2003	12:35	14.00	77.4	115.0	35.0	10.0	180	1.00	12.0	65	1013.0
17	14/01/2003	12:40	14.00	77.4	115.0	35.0	10.0	180	1.00	12.0	65	1013.0
18	14/01/2003	12:45	14.00	77.4	115.0	35.0	10.0	180	1.00	12.0	65	1013.0
19	14/01/2003	12:50	14.00	77.4	115.0	35.0	10.0	180	1.00	12.0	65	1013.0
20	14/01/2003	12:55	14.00	77.4	115.0	35.0	10.0	180	1.00	12.0	65	1013.0
TOTALS			14.00	77.4	115.0	35.0	10.0	180	1.00	12.0	65	1013.0

Numerical display of register data
(LeqT and sessions registers)



Program the LRF-04



Session schedule
(when the establishment can have an event)