Automated electrical test of sound level meters   February 11th, 2021

For the automated electrical test of sound level meter type approvals a practicable file is needed for every tested type of measurement (LAF, LZF, etc.) that writes the measured level together with a sound level meters state information into a file. **It is necessary for the transmitted measurement value to match with the one on the display.**

The files that transmit a value are labeled LAF.exe, LAS.exe, LZF.exe etc. (file list see below) and create the files LAF.dat, LAS.dat, LZF.dat etc.. The file contains the state information OK, OL, UL, ER or NA and the measured value. Decimal numbers are separated by a point (e.g. 94.3).

Status information abbreviations OK, OL, UL, ER and NA mean:

OK – Measurement is all right
OL – Overload
UL – Underload
ER – Error
NA – No information

For example
LAF is to be tested via interface. A file LAF.exe is needed to write the demanded information into the file LAF.dat.

>   1. A correct measurement comes to LAF 94.3 dB. The file LAF.exe generates a file LAF.dat and writes OK94.3 into that file.

>   2. An overload and a value of 145.3 dB are displayed. The file LAF.exe generates a file LAF.dat and writes OL145.3 into that file.

>   3. An underload and a value of 25.3 dB are displayed. The file LAF.exe generates a file LAF.dat and writes UL25.3 into that file.

>   4. An error and a value of 255.3 dB are displayed. The file LAF.exe generates a file LAF.dat and writes ER255.3 into that file.

>   5. A sound level meter is not equipped with state information and a value of 95.3 dB is displayed. The file LAF.exe generates a file LAF.dat and writes NA95.3 into that file.

Pay attention to write state information with capital letters and to separate decimal numbers by a point.

The functions "Start" and "Stop" have to operate via the interface. For that the **START.exe** and **STOP.exe** files are needed. The "Start" function starts a **new** measurement. The "Stop" function stops a measurement and should **always** be executable even without a preceding START.exe. With **LAEQT.exe** and **LAE.exe** files the levels can be read.

In **LAEQT.dat** and **LAE.dat** files the time in seconds has to be stated in the second line with at least one position after the decimal point!

Example for **LAEQT.dat**:

OK 94.3
10.0

As far as the types of measure are available at the sound level meter, the following data files are needed for the automatic electrical test, which have to run under Windows 7 and Windows 10:

	Measure-file	Output-file
1	LAF.exe	LAF.dat
2	LAS.exe	LAS.dat
3	LAI.exe	LAI.dat
4	LAFMAX.exe	LAFMAX.dat
5	LASMAX.exe	LASMAX.dat
6	LAIMAX.exe	LAIMAX.dat
7	LAEQT.exe	LAEQT.dat
8	LAE.exe	LAE.dat
9	LZF.exe	LZF.dat
10	LZS.exe	LZS.dat
11	LCF.exe	LCF.dat
12	LCS.exe	LCS.dat
13	LCPEAK.exe	LCPEAK.dat
14	LCFMAX.exe	LCFMAX.dat
15	LAL1.exe	LAL1.dat
16	LAL5.exe	LAL5.dat
17	LAL10.exe	LAL10.dat
18	LAL50.exe	LAL50.dat
19	LAL90.exe	LAL90.dat
20	LAL95.exe	LAL95.dat
21	LAL99.exe	LAL99.dat
22	LATM3F.exe	LATM3F.dat
23	LATM5F.exe	LATM5F.dat
24	LATM3I.exe	LATM3I.dat
25	LATM5I.exe	LATM5I.dat
26	LAFMIN.exe	LAFMIN.dat
27	LCFMIN.exe	LCFMIN.dat
28	LZFMIN.exe	LZFMIN.dat

The files LAF.exe, LAS.exe, LAI.exe, LCF.exe, LCS.exe; LZF.exe and LZS.exe configure the sound level meter, start the measurement and write the desired value into the corresponding file Lxx.dat.

If it is necessary to configure the sound level meter before carrying out the files LAxMAX.exe, LAEQT.exe, LAE.exe, LCPEAK.exe, LALx.exe and LATMxx.exe, the configuration can be done with the help of the following files:

LAFMAXsetup.exe
LASMAXsetup.exe
LAIMAXsetup.exe
LAEQTsetup.exe
LAEsetup.exe
LCPEAKsetup.exe
LATM3Fsetup.exe
LATM3Ssetup.exe
LATM5Fsetup.exe
LATM5Isetup.exe
and
LALsetup.exe (cumulative distribution)

For example the measurement of the cumulative distribution would then run as follows:

- LALsetup configures the sound level meter for cumulative distribution measurement
- START.exe starts the measurement.
- STOP.exe stops the measurement.
- The files LAL1.exe, LAL5.exe, LAL10.exe, LAL50.exe, LAL90.exe, LAL95.exe, LAL99.exe write the necessary exceedance levels into the files LAL1.dat, LAL5.dat, LAL10.dat, LAL50.dat, LAL90.dat, LAL95.dat, LAL99.dat.

Remark: Sound level meters that need no configuration prior to cumulative distribution measurement can do without LALsetup.exe file.

For several **measuring ranges** it is necessary to provide an executable file for each measuring range that switches to the particular measuring range. These files are indicated **MR1.exe, MR2.exe**,… and give back a file **MR.dat** containing a state string and a name of the chosen measurement range that is separated by a blank.
The state string is "**OK**" after successful switchover or "**ER**" after failed switchover.
The range name can be chosen according to the one in the handbook or according to the abbreviation showed on the display, but in any case it should mark a clear identification.
The numbering is consecutive from the lowest measuring range with the smallest number up to the highest measuring range with the largest number.

For example:
MR3.exe generates **MR.dat** with the content: OK RangeHigh

For checkbacks we offer our service.

AG 1.63 Filtertest according to EN 61260

The following tests on filter for sound level meters (SLM) can be offered for 1/1 and 1/3 octave filters:

1. Relative attenuation
2. Effective bandwidth deviation
3. Summation of output signals

For automatic performance of the tests the manufacturer should supply a file called oct1.exe or oct3.exe for 1/1 and 1/3 octave filters resp. which should generate on the controlling PC a data file oct1.dat or oct3.dat. This should include the output of all filters in the filter set in a form given below. The execution of the exe-file should initiate a filter measurement on the SLM and disable all other possibly interfering processes on the SLM and finally transfer the result to the PC file.

Content of Oct1.dat, oct3.dat
This ascii data file should contain in the first line a status information in two letters "OK" for successful performance, like in the other exe functions for SLMs.
The following lines should contain the nominal filter midband frequencies given in Hz beginning with the lowest one and separated by a " " space the output level of the filter band in dB. No units should be included. For decimal separation the period "." should be used, e.g. 31.5 for fm = 31.5 Hz, no other delimiters should be used:
Not 16 000 but 16000 for the 16 kHz octave band.
As line delimiters CR and LF can be used like in a simple text file.

A typical file oct1.dat could look like the following:

OK
8 44.6
16 34.9
31.5 42.8
63 39.4
125 50.0
250 60.7
500 73.6
1000 84.0
2000 76.0
4000 55.8
8000 45.2
16000 41.0