SVAN 956

VIBRATION

LEVEL METER & ANALYSER

USER'S MANUAL (DRAFT VERSION)

SVANTEK Sp. z o.o.
WARSAW, August 2007

Notice: *This user's manual presents the software revision named 6.05 / 6.05.3 (cf. the description of the* ***UNIT LABEL*** *position of the* ***DISPLAY*** *list). The succeeding software revisions (marked with the bigger numbers) can slightly change the view of some displays presented in the text of the manual.*

LIST OF FIGURES

1 INTRODUCTION

The **SVAN 956** is digital, Type 1 vibration level meter along with analyser. The instrument is intended to general vibration measurements, machinery condition monitoring, occupational health and safety monitoring. It can be used by consutants, maintenance services and industry R&D departments etc.

Instrument provides parallel acceleration, velocity, displacement measurements. Three vibration profiles allow parallel measurements with independently defined filters and RMS detector time constants. Each profile provides significant number of results (like **RMS**, **PEAK**, **Peak-Peak, VDV**, **MTVV or Max**). Advanced time history logging for each profile provides complete information about measured signal in non-volatile 32 MB internal memory or external USB Memory Stick and can be easy downloaded to any PC using the USB interface and SvanPC+ software.

All required weighting filters (e.g.: **Wk**, **Wd**, **Wc**, **Wj**, **Wm**, **Wh** for **Human Vibration measurement**, **Wg**, **Wb** or VelMF for machine diagnostic measurements) including the latest ISO 2631-1&2 and ISO 10816 standards are available with this instrument. The RMQ detector enables direct measurement of the Vibration Dose Value (**VDV**).

Using computational power of its digital signal processor the **SVAN 956** instrument can, simultaneously additionally perform real time **FFT** analysis, **1/1 OCTAVE analysis** or **1/3 OCTAVE** analysis and sophisticated enveloping analysis. The SVAN 956 offers also RPM measurement with Monarch laser tachometer parallel to the vibration measurement.

The time domain signal recording on the external USB memory stick is also available as an option.

The instrument can be controlled and the measuerement results can be also downloaded to any PC using the RS232 or IrDA interfaces.

. The instrument is powered from four AA standard or rechargeable batteries (i.e. NiMH - separate charger is required). The powering of the instrument from the External DC power source or the USB interface is also provided. Robust case and light weight design accomplish the exceptional features of this new generation instrument.

1.1 SVAN 956 as Vibration Meter & Analyser

- General vibration measurements (acceleration, velocity and displacement) and optionally HVM meeting ISO 8041:2005 and ISO 10816-1 standards in the frequency range depends on the parameters of the attached accelerometer, i.e. with DYTRAN 3185D general purpose transducer is equal to 2Hz ÷ 8 kHz
- parallel **RMS**, **VDV**, **MTVV (**or **MAX)**, **PEAK**, **PEAK–PEAK**
- **Z**, **HP1**, **HP3**, **HP10**, **KB**, **Wk**, **Wd**, **Wc**, **Wj**, **Wm**, **Wh (ISO 5349)**, **Wg (ISO 2631)**, **Wb** weighting filters
- **1/1 OCTAVE** and **1/3 OCTAVE** real time analysis (optional) - 15 filters with centre frequencies 1 Hz ÷16 kHz, Type 1 – IEC 61260 and 45 filters with centre frequencies 0.8 Hz ÷ 20 kHz, Type 1 – IEC 61260
- optional **FFT** spectra calculation (1920 lines in real time up to 22.4 kHz with Hanning, rectangle, flat top or Kaiser-Bessel window and linear averaging) parallel to the **VLM** operation

1.2 General features of SVAN 956

- Advanced **Data Logger** including spectra's logging on the **USB Memory Stick** providing almost unlimited logging capacity
- Time domain signal recording (option)
- Advanced trigger and alarm functions
- **USB 1.1 Host & Client interface** (real time PC "front end" application supported)

- **RS 232** and **IrDA** interfaces (options)
- Built-in **signal generator** (option)
- Integration time programmable up to **24 h**
- Power supply by **four AA** rechargeable or standard **batteries**
- Hand held, light weight and robust case
- Easy in use

1.3 Accessories included

- **GRAS 40AE -** prepolarised ½" microphone with nominal sensitivity 50 mV/Pa
- **SV 3185D accelerometer** with **SC 27** cable
- **SC 16 -** USB 1.1 cable
- **SC 59 -** I/O cable
- **SC 61** integrated connector
- **four AA** batteries
- **SvanPC+** for windows 2000/XP software

1.4 Accessories available

- **SA 17A** - external battery pack
- **SA 27/ 3185** – mounting magnet for the accelerometer
- **SA 18** - Carrying bag for SVAN 95x and accessories (leather)
- **SA 43** - carrying case for SVAN 95x and accessories
- **SA 45** - carrying case for SVAN 9xx and accessories (waterproof)
- **SA 46** - carrying belt-bag for SVAN 94x and SVAN 95x (leather)
- **SA 47** - carrying bag for SVAN 95x and accessories (fabric material)
- **SV 55** - RS 232 option for the SVAN 955

1.5 Software options available

SVAN956	Vibration Meter & FFT Analyser
SVAN956_WA	SVAN 956 without accelerometer and SC 27 cable
SVAN956_1	SVAN 956 including 1/1 & 1/3 octave
SVAN956_1WA	SVAN 956_WA including 1/1 & 1/3 oct.
SV 956_3	1/1 & 1/3 octave analysis option
SV 956_8	Rotation measurement option including Laser Tachometer
SV 956_9	Human Vibration filters option
SV 956_11	Enveloping analysis option
SV 956_15	Time domain signal recording option
SV 956_16	User programmable second order band pass filters

Notice: *The software options can be purchased in any time as only the introduction of the special code is required for their activation.*

SVAN 956 instrument with the accelerometer and tachometer

1.6 Current list of SVAN 956 options and accessories

The current list of the SVAN 956 options and accessories are presented below:

SVAN956	Vibration Meter & FFT Analyser
SVAN956_WA	SVAN 956 without accelerometer and SC 27 cable
SVAN956_1	SVAN 956 including 1/1 & 1/3 octave
SVAN956_1WA	SVAN 956_WA including 1/1 & 1/3 oct.
SV 956_3	1/1 & 1/3 octave analysis option
SV 956_8	Rotation measurement option including Laser Tachometer
SV 956_9	Human Vibration filters option
SV 956_11	Enveloping analysis option
SV 956_15	Time domain signal recording option
SV 956_16	User programmable second order band pass filters
SV 55	RS232 interface option for the SVAN 95x except SVAN 954

SV 56	IrDA interface option for the SVAN 95x except SVAN 954
SV 3185D	100 mV/g, TNC top connector, 1/4-28 mounting hole, general purpose accelerometer
SC 27	TNC (plug) to TNC (plug) coil cable (2 m)
SC 59	LEMO 2 pin (plug) to 2 x BNC sockets
SA 18	Carrying bag for SVAN 95x and accessories (leather)
SA 27/3185D	Mounting magnet for the accelerometer
SA 45	Carrying case for SVAN 95x and accessories (waterproof)
SA 46	Carrying belt-bag for SVAN 95x (leather)
SA 47	Carrying bag for SVAN 95x and accessories (fabric material)
SA 48	Carrying case for SVAN 958 and accessories (waterproof) by PROTECTOR

2 MANUAL CONTROL OF THE INSTRUMENT

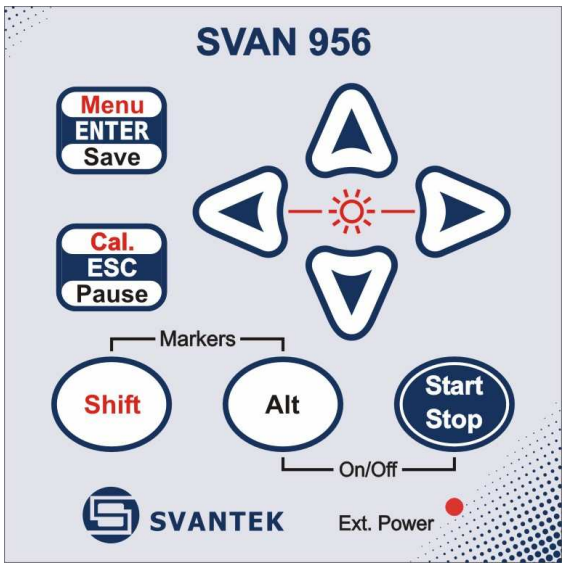
The control of the instrument is developed in the fully conversational way. The user can operate the instrument by selecting the proper position from the MENU list. Thanks to that, the number of the control push-buttons of the instrument is reduced to nine.

2.1 Control push-buttons on the front panel

On the front panel of the instrument, there are located the following control push-buttons:

1. **<ENTER>**, **(<MENU>)**, **[<SAVE>]**,
2. **<ESC>**, **(<CAL>)**, **[<PAUSE>]**,
3. **<SHIFT>**, [Markers]
4. **<ALT>**, [Markers]
5. **<▲>**,
6. **<◀>**,
7. **<▶>**,
8. **<▼>**,
9. **<START / STOP>**.

The name given in (...) brackets denotes the second push-button function which is available after pressing it in conjunction (or in sequence) with the **<SHIFT>** push-button. For the first two push-buttons the name given in square brackets [...] denotes also the third push-button function which is available after pressing it in conjunction (or in sequence) with the **<ALT>** push-button.



Control push-buttons of the SVAN 956 instrument

<SHIFT>

The second function of a push-button (written in red colour on a push-button) can be used when the **<SHIFT>** push-button is pressed. This push-button can be used in two different ways:

- as **SHIFT** in the keyboard (e.g. while typing the filename); both **<SHIFT>** and the second push-button **must be pressed in parallel**;

- as **2nd Fun**; this push-button can **be pressed and released before pressing the second one** or **pressed in parallel** (while operating in *"**2nd Fun**"* mode, see the following notice) with the second push-button.

The **<SHIFT>** push-button pressed in conjunction with the **<ALT>** one enables the user to enter the **Markers** on the plots during the measurement.

***Notice:** The operation of this push-button can be set as the "**Shift**" mode or the "**2nd Fun**." mode in the **SHIFT** position (path: MENU / SETUP /SHIFT MODE / SHIFT) - see description of the **SETUP** list.*

<ALT>

This push-button enables one to choose the third push-button function in case of **[<SAVE>]** and **[<PAUSE>]** push-buttons. In order to select the third function the user must press the **<ALT>** and the second push-button simultaneously.

The **<ALT>** push-button pressed together with the **<SHIFT>** one enables the user to enter the **Markers** on the plots during the measurement.

***Notice:** The simultaneous pressing of the **<ALT>** and **<START / STOP>** push-buttons switches the instrument on and off.*

<START / STOP>

This push-button enables one to start the measurement process, when the instrument is not measuring or to stop it, when the instrument is in course of the measurement. It is also possible to set such mode of this push-button, in which in order to start or stop the measurements the user has to press it simultaneously with the **<SHIFT>** one.

***Notice:** The change of the **<START / STOP>** push-button mode is performed in the **SHIFT MODE** window of the **SETUP** list (see description of the **SETUP** list).*

<ENTER>

This push-button enables one to enter the selected operation mode or to confirm the control options. Some additional functions of this push-button will be described in the following chapters of this manual.

(<MENU>)

This push-button (pressed together with the **<SHIFT>** one) enables the user to enter the main list containing six sub-lists: **FUNCTION**, **INPUT**, **DISPLAY**, **FILE**, **REPORT** and **SETUP**. Each of the mentioned above sub-lists consists of the sub-lists, elements and data windows. These main sub-lists

will be described in details in the following chapters of the manual. Double pressed **<MENU>** push-button enters the list containing eight last opened sub-lists. It often speeds up the control of the instrument as the user has the faster access to the frequently used sub-lists.

[<SAVE>]

This push-button (pressed together with the **<ALT>** one) enables the user to save measurement results as a file in the internal instrument's memory or on the USB memory stick. There are two available functions: **SAVE NEXT** - save a file with the name increased by one (e.g. 02JAN0, 02JAN1, 02JAN3) and **SAVE** - save a file with the edited name.

<ESC>

This push-button closes the control lists, sub-lists or windows. It acts in opposite to the **<ENTER>** push-button. When the window is closed pressing the **<ESC>** push-button, any changes made in it are ignored in almost all cases.

([CAL])

This push-button (pressed together with the **<SHIFT>** one) enters the **CALIBRATION** sub-list in which the user can enter one of the available sub-lists (**BY SENSITIVITY**, **BY MEASUREMENT**, **LAST CALIBRATION** and **TEDS**).

[<PAUSE>]

This push-button enables one to break the measurement process temporarily. The subsequent pressing of the **<PAUSE>** push-button deletes the measurement results from the last one second. The indicator of the measurement time is counted down after each pressing and the measurement result from the previous second appears on the display. Up to fifteen last seconds of the measurement can be cancelled in this way.

<◄>, **<►>**

These push-buttons enable one, in particular, to:

- select the options in an active position in the "horizontal direction" (e.g. filter **HP1**, **HP3**, **HP10**, Integration period: **1s**, **2s**, **3s**, … etc.)
- select the measurement result to be displayed (e.g. **RMS, OVL, PEAK** etc.) in one profile and **3 PROFILES** modes of result's presentation)
- control the cursor in **LOGGER** and **SPECTRUM** mode of result's presentation
- select the position of the character in the text edition (i.e. in the **FILE NAME** menu)
- switch on/ off the **BACKLIGHT** of the display (**<◄>**+**<►>** pressed together)
- activate markers 2 and 3

(<◄>, <►>)

The **<◄>**, **<►>** push-buttons pressed in conjunction (or in sequence) with the **<SHIFT>** enable one, in particular, to:

- speed up the changing of the numerical values of the parameters (i.e. the step is increased from 1 to 10 in the setting of **START DELAY** - *path: MENU / INPUT / MEASUREMENT SETUP / START DELAY*)
- insert or delete a character in the text edition modes

Some other possible reactions of the instrument on the pressing of these push-buttons will be described in details in the following chapters.

<▲>, <▼>

The **<▲>**, **<▼>** push-buttons enable one, in particular, to:

- change the mode of result's presentation
- select the proper character from the list in the text edition mode
- switch the active sub-list in a list
- programme the Real Time Clock (**RTC**) and **TIMER**
- activate markers 1 and 4

Some other possible reactions of the instrument on the pressing of these push-buttons will be described in details in the following chapters.

(<▲>, <▼>)

The **<▲>**, **<▼>** push-buttons pressed in conjunction (or in sequence) with the **<SHIFT>** enable one, in particular, to:

- change the relation between the Y-axis and X-axis of all plots presented on the screen
- switch the active profile in **3 PROFILES** mode of result's presentation

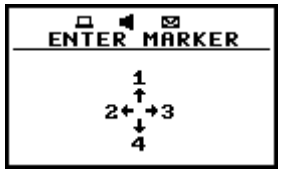
Some other possible reactions of the instrument on the pressing of these push-buttons will be described in details in the following chapters.

[Markers]

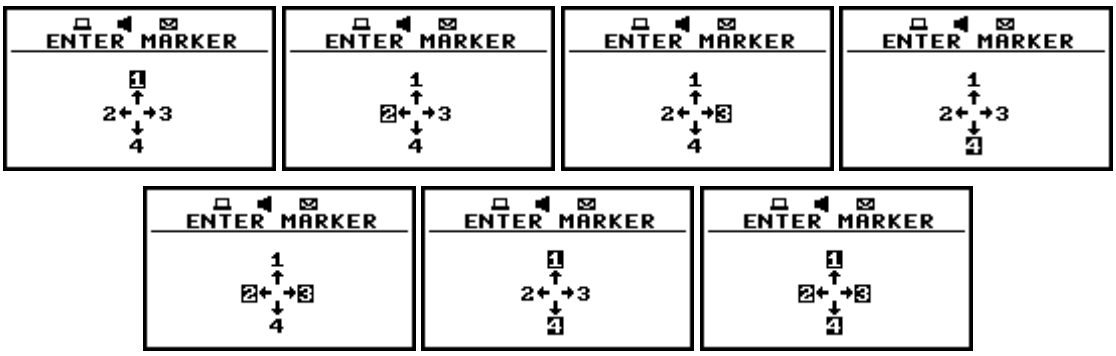
The **Markers** enable the user to mark special events, which occurred during the performed measurements (i.e. the airplane flight, the dog's barking, the train's drive etc.). The logger has to be switched on (*path: MENU / INPUT / MEASUREMENT SETUP / LOGGER On*) in order to activate the markers and one or more logger options (**LOGGER PEAK**, **LOGGER P–P**, **LOGGER MAX**, **LOGGER RMS**) in profiles have to be chosen (*path: MENU / INPUT / PROFILE x*). In order to enter the marker the user must press **<SHIFT>** and **<ALT>** push-buttons simultaneously during the measurement. The **ENTER MARKER** window opens and there are four available marker numbers. To choose marker number 1 the user must press **<▲>** push button (number 2 - **<◄>**, number - 3 **<►>** and number 4 - **<▼>**).

The **ENTER MARKER** window closes automatically and chosen marker is activated (after pressing **<SHIFT>** + **<ALT>** again active marker number will be highlighted). In order to switch off the marker, the user has to open the **ENTER MARKER** window and press this push-button, which refers to the marker to be switched off.

The current state of the markers is indicated in the logger's file (cf. App. B for details) and can be used to show them using dedicated presentation software.

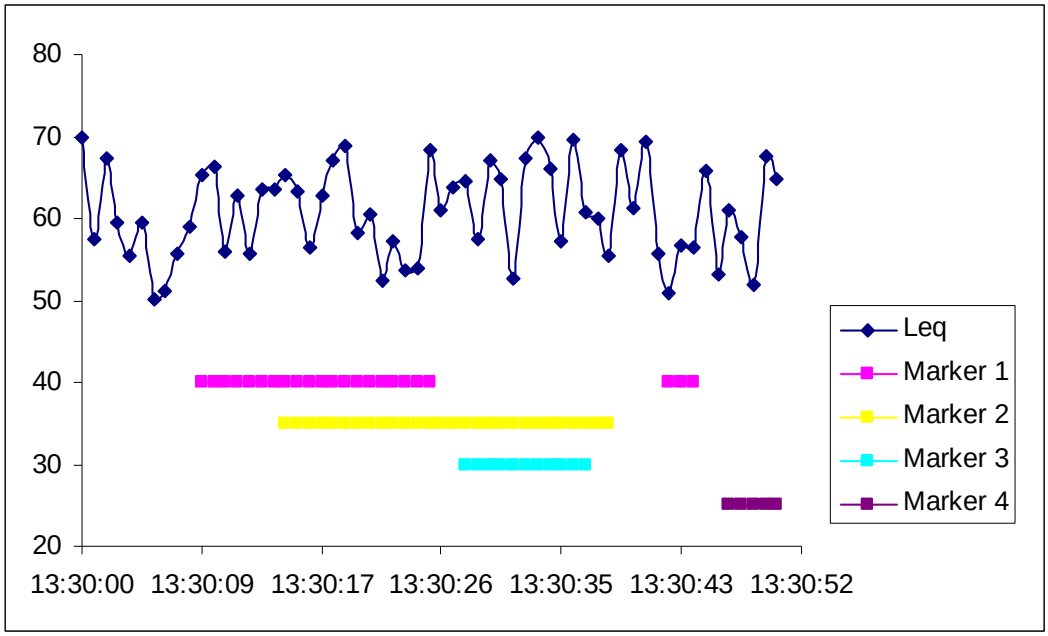


Display with the "MARKERS" (after pressing <ALT> and <SHIFT> together)



Displays with the activated markers

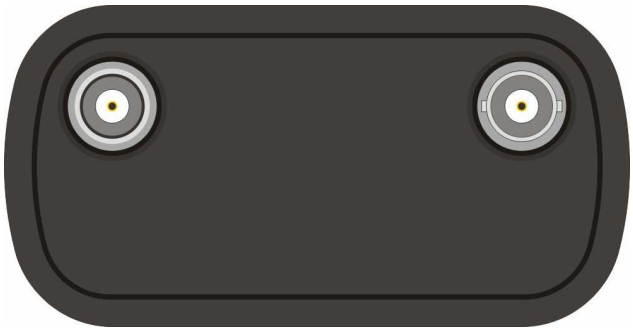
The exemplary presentation of the markers on the time history plot is shown below (to view a plot with markers the user has to transfer data to the proper software).



Time history plot with the indication of the active markers

2.2 Input and output sockets of the instrument

The instrument inputs, called **Acceler.** and **Probe** are placed in the centre of the instrument's top cover. The accelerometer have to be connected to the instrument using the TNC connector. After plug in the accelerometer to the measurement input, the screw should be twisted to the light resistance. The full description of the signals connected to the sockets is given in the Appendix C.



Top cover of the SVAN 956 instrument in 1:1 scale

In the bottom cover there are four sockets, placed from the right to the left as follows: **Ext. Pow.**, **USB Host**, **USB Device** (**USB Client**) and **I/O**.

Bottom cover of the SVAN 956 instrument in 1:1 scale

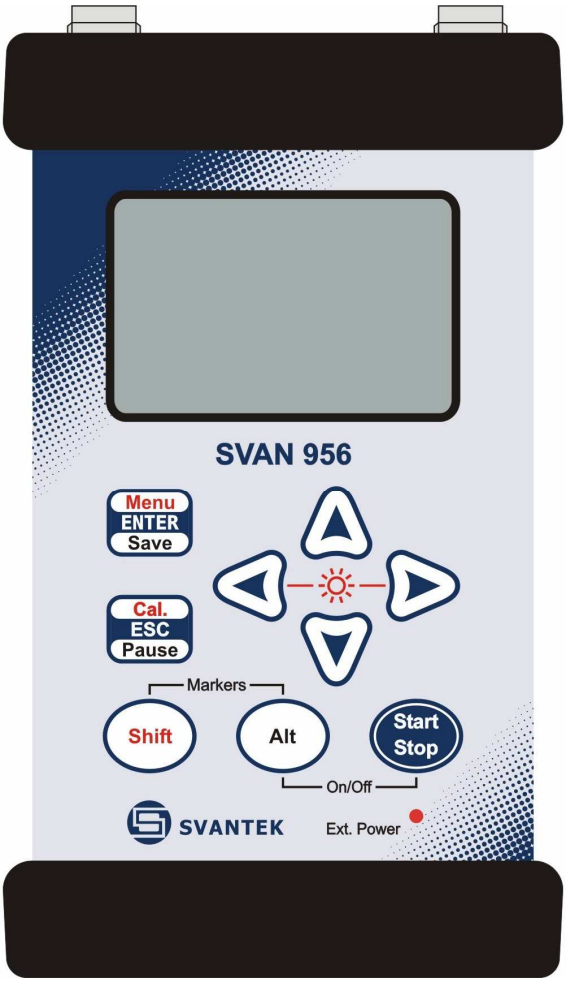
The **USB Device** 1.1 interface is the serial interface working with 12 MHz clock. Thanks to its speed, it is widely used in all PC. In the instrument, the standard 4-pins socket is used described in details in Appendix C.

The **USB Host** interface can be used to connect the external USB Memory Stick or USB hard disk, enabling the device to register virtually infinite sequence of measurement results.

The additional multi purpose input / output socket, called **I/O**, is a two-pins LEMO socket. On this socket, in the case when the Analogue Output functionality is selected, the signal from the input of the analogue / digital converter (before the correction) is available. This signal can be registered using magnetic recorder or observed on the oscilloscope. The Digital Input as another functionality serves as the external trigger, while the Digital Output is used to generate the trigger pulse or alarm pulse from the instrument.

To the **Ext. Pow.** socket located on the bottom cover of the instrument, dedicated for the connector type 5.5 / 2.1 mm, the user can connect the external power (110 V / 220 V mains) adapter. The instrument can be charged from the external DC source (from 6 V to 15 V). The current consumption depends on the voltage of the power supplier.

Notice: *Switch the power off before connecting the instrument to any other device (e.g. a printer or a Personal Computer).*



Front panel of the SVAN 956 instrument in 1:1 scale

Rear panel of the SVAN 956 instrument in 1:1 scale

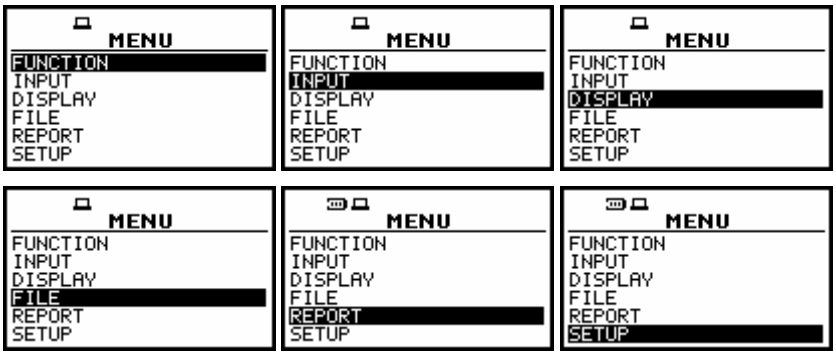
3 SETTING THE INSTRUMENT

In order to perform the measurements using the instrument the user has only to plug-in the proper transducer and to switch the power on.

Notice: The user has to press the* <ALT> *and* <START / STOP> *push-buttons in parallel in order to switch the power On/Off.

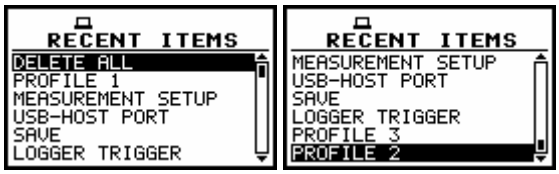
3.1 Basis of the instrument's control

The instrument is controlled by means of nine push-buttons of the keyboard. Using these push-buttons one can access all available functions. The functions are placed in the system of lists and sub-lists. The main list contains the headers of **six lists**, which also contain sub-lists or positions (elements). The main list is opened after pressing the **<MENU>** push-button. This list contains the following lists: **FUNCTION**, **INPUT**, **DISPLAY**, **FILE**, **REPORT** and **SETUP**. The elements of each list are described in details in Chapters 4 ÷ 9. Only one list can be accessed at a time, the one which name is highlighted (displayed inversely). The change of the highlighted line is done after pressing the **<▲>**, **<▼>** (or **<◄>**, **<►>**) push-buttons.



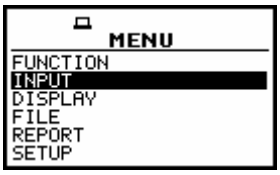
Displays with the highlighted elements of the main list

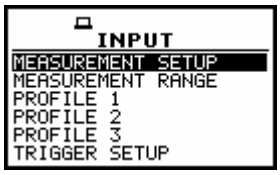
After double pressing of the **<MENU>** push-button the scrolled list of recently accessed menu items appears on the display. The example of this list is presented below. Such solution enables one to access the most frequently used lists quickly, without the necessity of passing the whole path.



Display with the recently accessed menu items (after double pressing of the <MENU> push-button)

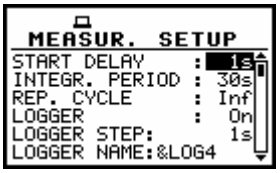
After the selection of the desired list (the **<▲>** or **<▼>** push-buttons), the user has to press the **<ENTER>** push-button in order to enter it. After this new sub-lists, positions (elements) or various data specification appear on the display.

a) 

b) 

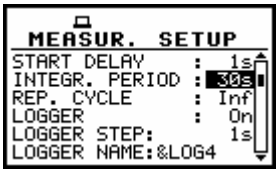
Displays with the main list (a) and the elements of the INPUT list (b)

Next pressing of the **<ENTER>** push-button enables one to access mentioned above sub-lists.



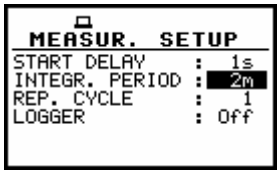
MEASUREMENT SETUP window opened ***(path: MENU / INPUT / MEASUREMENT SETUP)***

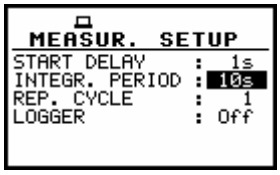
The desired position of a list is accessed after pressing the **<▲>** or **<▼>** push-button.



MEASUREMENT SETUP window; the INTEGR. PERIOD position accessible

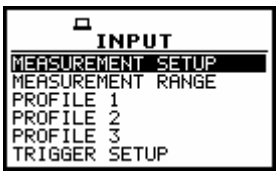
The change of the value in a selected position is performed by pressing the **<◄>** or **<►>** push-buttons.

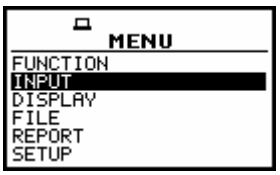


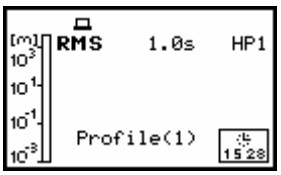


Displays with the accessed INTEGR. PERIOD position after pressing the <◄> or <►> push-buttons, respectively

The **<ENTER>** push-button is used for the confirmation of the selection in a position and for closing the opened sub-list. The sub-list is closed ignoring any changes made in a sub-list by pressing the **<ESC>** push-button.





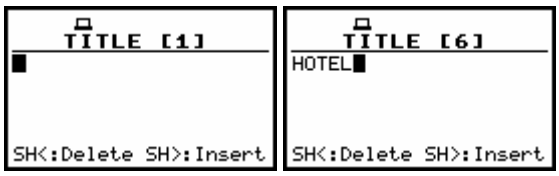


Displays after three consecutive pressing of the <ESC> push-button from the MEASUR. SETUP sub-list

As it was mentioned, some of the sub-lists end with the windows informing the user about the state of the instrument, available memory, not existing files or loggers, standards fulfilled by the unit, etc. In order to close such window the user has to press the **<ESC>** push-button.

Displays during and after the accessing the FREE SPACE window ***(path: MENU / FILE / FREE SPACE)***

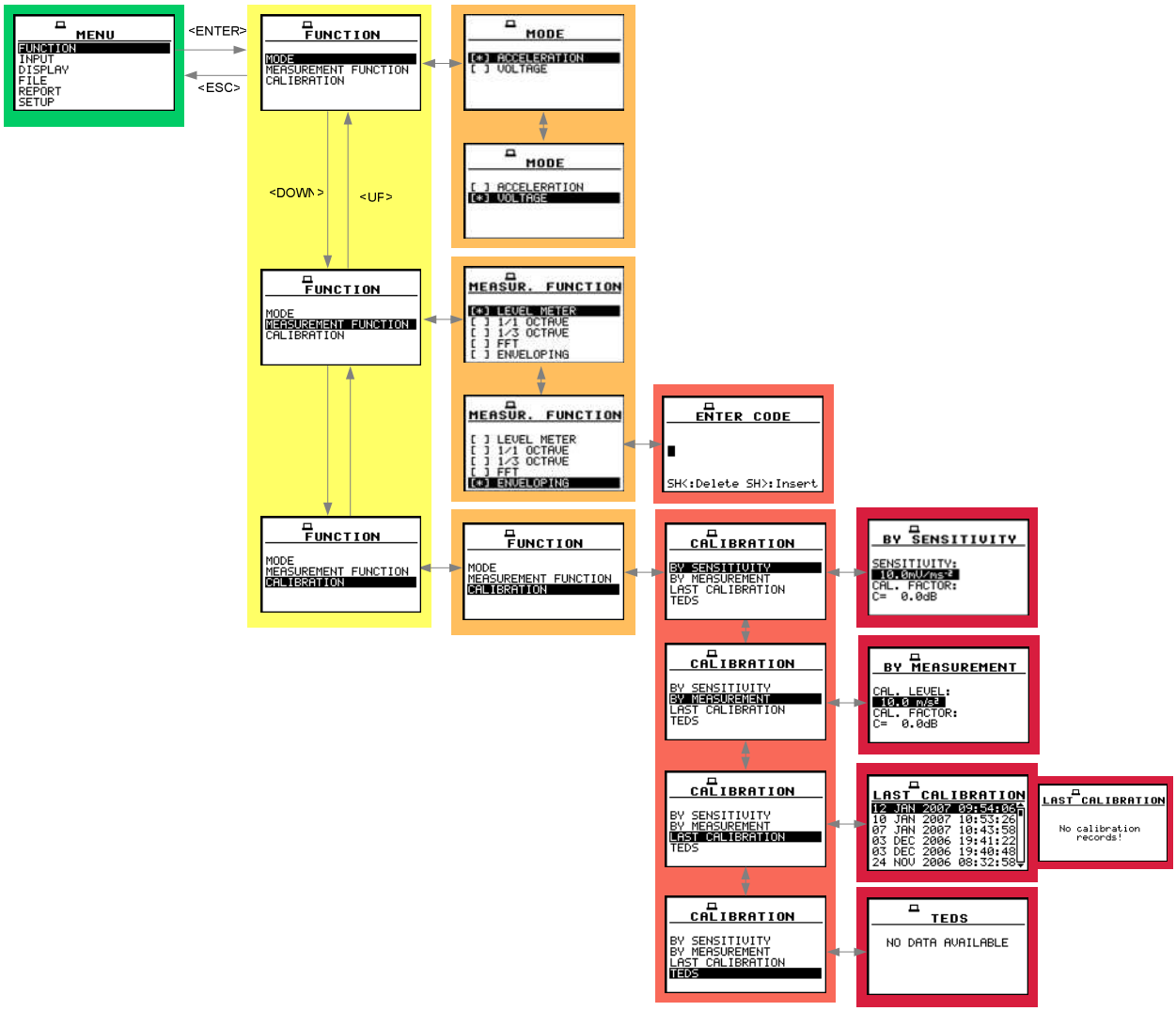
In the instrument, there are also windows, which are used for entering text (i.e. the name of the file, the header for the printed reports from the measurements).



Displays during the edition of the text, which has to be printed as a header in the measurement reports ***(path: MENU / REPORT / TITLE)***

Below the structure of the elements of the main list is presented. The more detailed description of the **FUNCTION**, **INPUT**, **DISPLAY**, **FILE**, **REPORT** and **SETUP** lists is given in the following chapters.

- **FUNCTION** (one of the main lists available after pressing the **<MENU>** push-button)
  - **MODE**
    - **ACCELERATION**; available values: **[ ]** / **[*]**
    - **VOLTAGE** ; available values: **[ ]** / **[*]**
  - **MEASUREMENT FUNCTION** (sub-list)
    - **LEVEL METER**; available values: **[ ]** / **[*]**
    - **1/1 OCTAVE**; available values: **[ ]** / **[*]**
    - **1/3 OCTAVE**; available values: **[ ]** / **[*]**
    - **FFT**; available values: **[ ]** / **[*]**
    - **ENVELOPING**; available values: **[ ]** / **[*]]**
  - **CALIBRATION** (sub-list)
    - **BY SENSITIVITY**
      - **SENSITIVITY**; available values of sensitivity in mV/Pa:
        - **10 µV / ms^{-2}** .. **10 V / ms^{-2}**
      - **CAL. FACTOR**; it displays calculated calibration factor
    - **BY MEASUREMENT** (sub-list)
      - **CAL. LEVEL**; available values of calibration level:
        - **100 mm / s^2** .. **1 km / s^2** in the case of vibration measurements(or **100 dB** .. **180 dB** if the reference level was set to **1 µm / s^2** and the **LOGARITHM** scale was selected in the **DISPLAY SCALE** sub-list)
      - **CAL. FACTOR**; it displays calculated calibration factor after the measurement
    - **LAST CALIBRATION**; it enables the user to view the last calibration records
    - **TEDS -** automatical reading of the transducer parameters by the instrument, this function will be available soon, **NO DATA AVAILABLE** message appears on the display



Control diagram of the FUNCTION list

- **INPUT** (one of the main lists available after pressing the **<MENU>** push-button)
  - **MEASUREMENT SETUP** (sub-list)
    - **START DELAY**; available values of the delay before starting the execution of the measurements: **1s** .. **60s**
    - **INTEGR. PERIOD**; available values of the integration time: **Inf**, **1s** .. **24h**
    - **REP. CYCLE**; available values for the measurement cycles, which has to be repeated: **Inf**, **1** .. **1000**
    - **LOGGER off/ on**; saving measurement results in instrument's logger memory
      - **LOGGER STEP**; available values of the step with which the measurement results are saved in an instrument's logger: **2 ms** .. **1 h**
      - **LOGGER NAME**; editing the name of the logger's file
  - **MEASUREMENT RANGE**; range of the vibration level measurements
    - **LOW**
      - **RMS (HP)**: **1.41 mm/s^2 ÷ 100 m/s^2**, **PEAK**: **31.6 mm/s^2 ÷ 141 m/s^2** in the case of vibration measurements
    - **HIGH**

- **RMS (HP)**: **10 mm/s^2 ÷ 708 m/s^2**, **PEAK**: **316 mm/s^2 ÷ 1 km/s^2** in the case of vibration measurements

➢ **PROFILE 1** (sub-list)

- **FILTER**; available digital weighting filters used in the first profile during the measurements:
  - **R3**, **R2**, **R1**, **Z**, **HP1**, **HP3**, **HP10**, **Vel1**, **Vel3**, **Vel10**, **VelMF**, **Dil1**, **Dil3**, **Dil10**, **W–Bxy**, **W–Bz**, **H–A**, **W–Bc**, **KB**, **Wk**, **Wd**, **Wc**, **Wj**, **Wm**, **Wh**, **Wg**, **Wb**; available filters in vibration measurements
- **DETECTOR**; available values of the detector time constant used in the first profile:
  - **100ms**, **125ms**, **200ms**, **500ms**, **1.0s**, **2.0s**, **5.0s**, **10.0s**; available detector time constants
- **LOGGER**; available measurement results which has to be saved in the instrument's logger from the first profile (setting possible only when LOGGER is switched on (*path: MENU / INPUT / MEASUREMENT SETUP / LOGGER On*)
  - **PEAK**, **P–P**, **MAX**, **RMS**

➢ **PROFILE 2** (sub-list)

- **FILTER**; available digital weighting filters used in the second profile during the measurements:
  - **R3**, **R2**, **R1**, **Z**, **HP1**, **HP3**, **HP10**, **Vel1**, **Vel3**, **Vel10**, **VelMF**, **Dil1**, **Dil3**, **Dil10**, **W–Bxy**, **W–Bz**, **H–A**, **W–Bc**, **KB**, **Wk**, **Wd**, **Wc**, **Wj**, **Wm**, **Wh**, **Wg**, **Wb**
- **DETECTOR**; available values of the detector time constant used in the second profile:
  - **100ms**, **125ms**, **200ms**, **500ms**, **1.0s**, **2.0s**, **5.0s**, **10.0s**
- **LOGGER**; available measurement results which has to be saved in the instrument's logger from the second profile
  - **PEAK**, **P–P**, **MAX**, **RMS**

➢ **PROFILE 3** (sub-list)

- **FILTER**; available digital weighting filters used in the third profile during the measurements:
  - **R3**, **R2**, **R1**, **Z**, **HP1**, **HP3**, **HP10**, **Vel1**, **Vel3**, **Vel10**, **VelMF**, **Dil1**, **Dil3**, **Dil10**, **W–Bxy**, **W–Bz**, **H–A**, **W–Bc**, **KB**, **Wk**, **Wd**, **Wc**, **Wj**, **Wm**, **Wh**, **Wg**, **Wb**
- **DETECTOR**; available values of the detector time constant used in the third profile:
  - **100ms**, **125ms**, **200ms**, **500ms**, **1.0s**, **2.0s**, **5.0s**, **10.0s**
- **LOGGER**; available measurement results which has to be saved in the instrument's logger from the third profile
  - **PEAK**, **P–P**, **MAX**, **RMS**

➢ **SPECTRUM** (sub-list); this sub-list is not available in the case of the **VLM**; it appears on the display in the case of **1/1 OCTAVE** or **1/3 OCTAVE** analyser

- **FILTER** (position); only Z filter is available for **1/1 OCTAVE** or **1/3 OCTAVE** analysis
- **BAND: FULL**
- **LOGGER** (position); it enables the user to save RMS results from **1/1 OCTAVE** or **1/3 OCTAVE** measurement function; available values: **[ ]** or **[√]**

➢ **FFT** (sub-list) this sub-list appears on the display in the case of the **FFT** analyser

- **AVERAGING** (position); it informs the user about the available averaging during **FFT** analysis:
  - **LINEAR**
- **FILTER** (position); available types of the digital weighting filter used during **FFT** analysis
- **BAND** (position); available values of the bands of the **FFT** analysis: **87.5Hz**, **175Hz**, **350Hz**, **700Hz**, **1.4kHz**, **2.8kHz**, **5.6kHz**, **11.2kHz**, **22.4kHz**
- **WINDOW** (position), it informs the user about the available coefficients of time window: **HANNING**, **RECTANGLE**, **FLAT TOP**, **KAISER-BESSEL**

- **LINES**; available values: **480**, **960**, **1920**
- **LOGGER**; available values: **[ ]** or **[√]**

➢ **RPM** (sub-list) this sub-list appears on the display after activation of **RPM MEASUREMENT** option in **SETUP** list

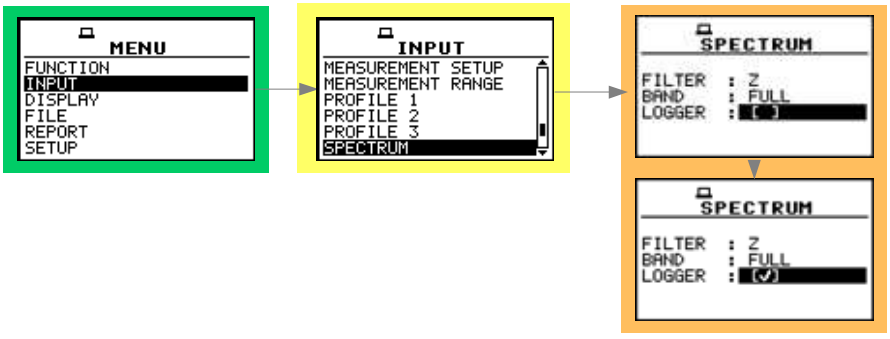
- **RPM**; it enables the user to switch on the rotation measurement option, available **[ ]** or **[√]**
- **PULSE/ROT**.; it enables the user to select the number of pulses / rotations, available values: **1**, **2**, .. **360**
- **UNIT**; available values: commonly used **RPM** (revolutions per minute) or **RPS** (revolutions per second)

➢ **ENVELOPING**(sub-list) this sub-list appears on the display in the case of the **ENVELOPING** mode

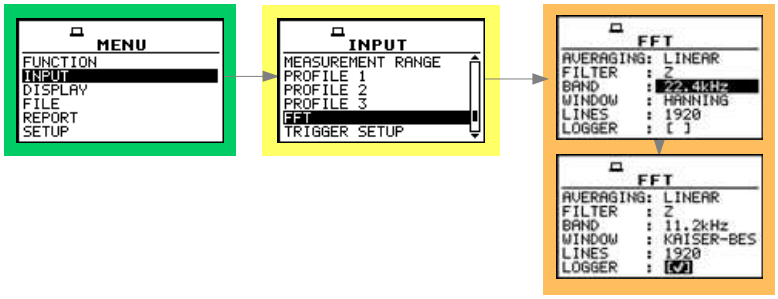
- **FILTER** (position); available values of the filter in ENVELOPING mode: **800Hz** .. **20kHz**
- **BAND** (position); available values of the band of the ENVELOPING mode: **22Hz** .. **22.4kHz**
- **LINES**; available values: **480**, **960**, **1920**

➢ **TRIGGER SETUP** (sub-list) (in **LEVEL METER** mode, *path: MENU / FUNCTION / MEASUREMENT FUNCTION / LEVEL METER)*

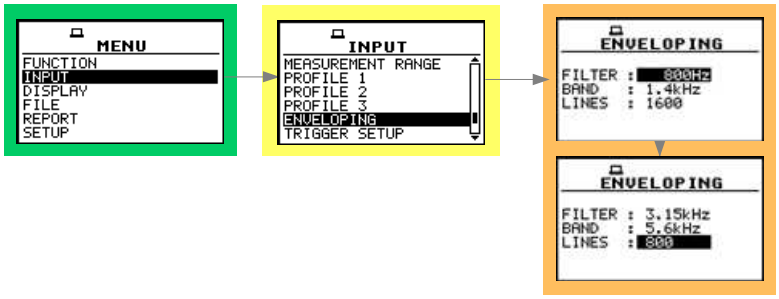
- **MEASURE TRIGGER**; it enables the user to switch **on** or **off** the triggering
  - **TRIGGER**; available options: **SLOPE+**, **SLOPE–**, **LEVEL+**, **LEVEL–**, **GRAD+**
  - **SOURCE**; available sources are **RMS (1)** and **EXT. I/O** (for **SLOPE**)
  - **LEVEL**; available values **24** .. **136** dB
- **LOGGER TRIGGER**; it enables the user to switch **on** or **off** the triggering in logger
  - **TRIGGER**; available values **LEVEL+, LEVEL–**
  - **SOURCE: RMS (1)**
  - **LEVEL**; available values **24** .. **136 dB**
  - **PRE**; available values **0** .. **50**, (for **LOGGER STEP** equal to 100 ms => **0.0** .. **5.0 s**)
  - **POST**; available values **0** .. **200**, (for **LOGGER STEP** equal to 100 ms => **0.0** .. **20.0 s**)
- **RECORDER TRIGGER**; it enables the user to switch **on** or **off** the trigger of recording
  - **TRIGGER**; available options: **SLOPE+**, **SLOPE–**, **LEVEL+**, **LEVEL–**, **GRAD+**
  - **SOURCE**; available sources are **RMS (1)** and **EXT. I/O** (for **SLOPE**)
  - **LEVEL**; available values **24** .. **136** dB, **1 mm / s^2** .. **10 km / s^2**
  - **GRADIENT** (for **GRAD+**); available values **1 dB / ms** .. **100 dB / ms**



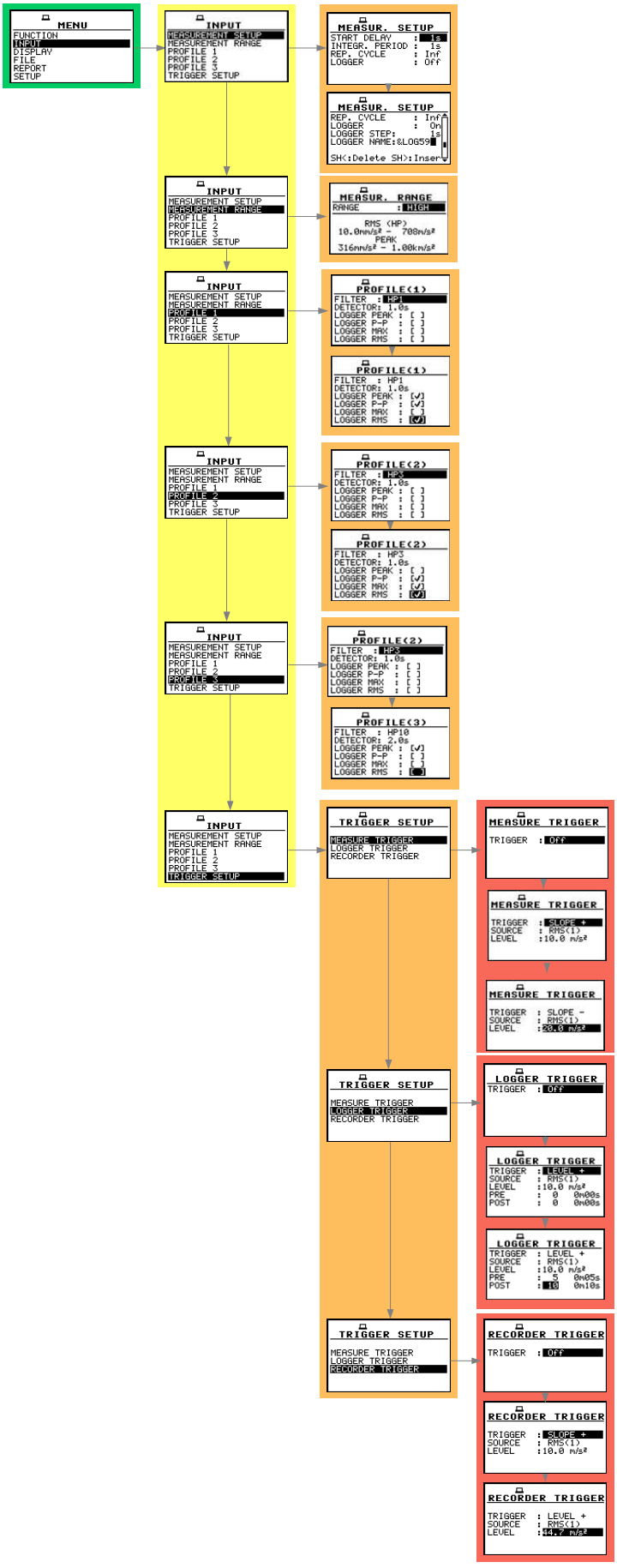
Control diagram of the INPUT list in the 1/1 OCTAVE and 1/3 OCTAVE mode



Control diagram of the INPUT list in the FFT mode



Control diagram of the INPUT list in the ENVELOPING mode



Control diagram of the INPUT list in the LEVEL METER mode

- **DISPLAY** (one of the main lists available after pressing the **<MENU>** push-button)
  - **DISPLAY MODES** (sub-list); it enables the user to activate (**[√]**) or switch off (**[ ]**) the available modes of result's presentation
    - **SPECTRUM**; available values: **[√]** or **[ ]**; this position is active only for **1/1 OCTAVE**, **1/3 OCTAVE** and **FFT** mode
    - **3 PROFILES**; available values: **[√]** or **[ ]**
    - **LOGGER**; available values: **[√]** or **[ ]**
    - **FILE INFO**; available values: **[√]** or **[ ]**
  - **DISPLAY SETUP** (sub-list)
    - **DISPLAY SCALE**
      - **SCALE**; available values: **LIN**, **LOG**
      - **X-ZOOM**; it informs the user about the multiplier for the horizontal axis of the graphical modes of the result's presentation; available values in **1/1 OCTAVE** and **1/3 OCTAVE** analyser: **3x, 4x, 5x**
      - **GRID**; available values **[ ] or [√]**
    - **SPECTRUM VIEW** (in the case of **1/1 OCTAVE**, **1/3 OCTAVE** or **FFT** analysis)
      - **VIEW**; available spectrum views: **NORMAL**, **FULL**, **EXTENDED**
      - **TYPE** available types of spectrum views: **AVERAGED**, **INSTANTANEOUS**, **MAX**, **MIN**
      - **MAX**; position is accessible if in **TYPE** position **AVERAGED** or **INSTANTANEOUS** were selected; available values: **[ ] or [√]**
      - **MIN**; position is accessible if in **TYPE** position **AVERAGED** or **INSTANTANEOUS** were selected; available values **[ ] or [√]**
    - **SPECTRUM TYPE**;available spectrum types (in the case of vibration only: **ACCELERATION**, **VELOCITY**, **DISPLACEMENT**
    - **TOTAL VALUES** (in the case of **1/1 OCTAVE** or **1/3 OCTAVE** vibration analysis)
      - **TOTAL 1**; available positions in the case of vibration measurements:
        - **FILTER**; available values: **Z**, **S1**, **S2**, **S3**
        - **TYPE**; it appears when **FILTER** different than **Z**; available values: **ACC**, **VEL**, **DIL**
        - **CAL. F.** ; it appears as above; available values: **–60 dB**, .., **60 dB**
      - **TOTAL 2**; available positions:
        - **FILTER**; available values: **PR 2**, **S1**, **S2**, **S3**
        - **TYPE**; it appears when **FILTER** different than **PR 2**; available values: **ACC**, **VEL**, **DIL**
        - **CAL. F.**; it appears as above; available values: **–60 dB**, .., **60 dB**
      - **TOTAL 3**; available positions:
        - **FILTER**; available values: **PR 3**, **S1**, **S2**, **S3**
        - **TYPE**; it appears when **FILTER** different than **PR 3**; available values: **ACC**, **VEL**, **DIL**
        - **CAL. F.**; it appears as above; available values: **–60 dB**, .., **60 dB**
    - **LOGGER VIEW**;
      - **VIEW**; available logger views: **NORMAL**, **FULL**, **EXTENDED**
      - **TIME**; available time settings for logger: **REAL TIME**, **AVAILABLE TIME**
  - **LOGGER VIEW** (sub-list)
    - **FILE NO.**; number of the files in the instrument's logger containing the results of the measurements
    - **LOG. FILE**; name of the viewed logger's file

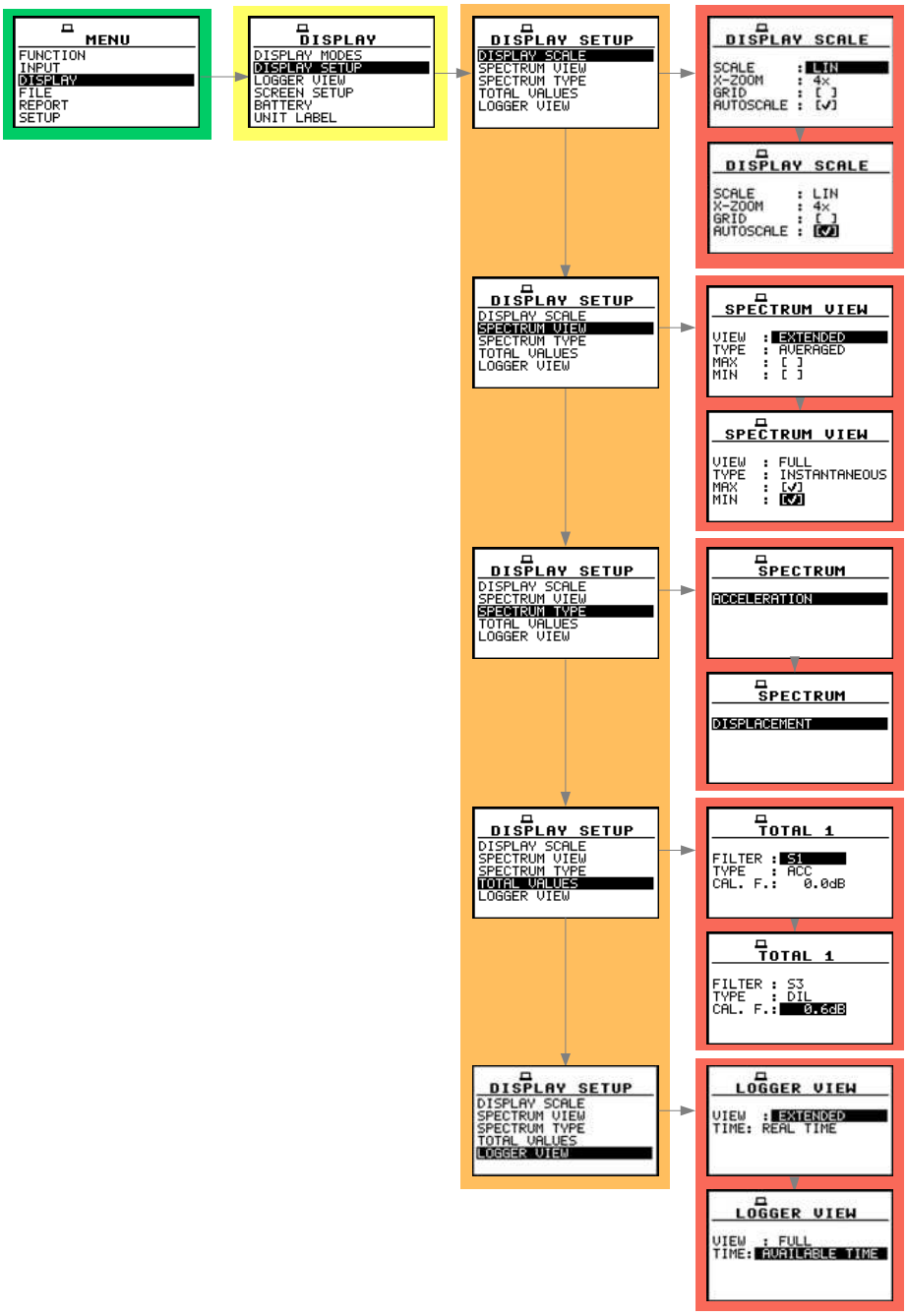
- **RECORDS**; number of records in the viewed logger's file
- **P(1)**; settings for logger in PROFILE 1 (**INPUT** list), available values **PEAK**, **P–P**, **MAX**, **RMS**
- **P(2)**; settings for logger in PROFILE 2 (**INPUT** list), available values **PEAK**, **P–P**, **MAX**, **RMS**
- **P(3)**; settings for logger in PROFILE 3 (**INPUT** list), available values **PEAK**, **P–P**, **MAX**, **RMS**
- **FREE**; it informs the user about the size of remaining free memory for logger files
- **AVAILABLE**; it informs the user about the size of the available memory for logger files

➢ **SCREEN SETUP** (sub-list)

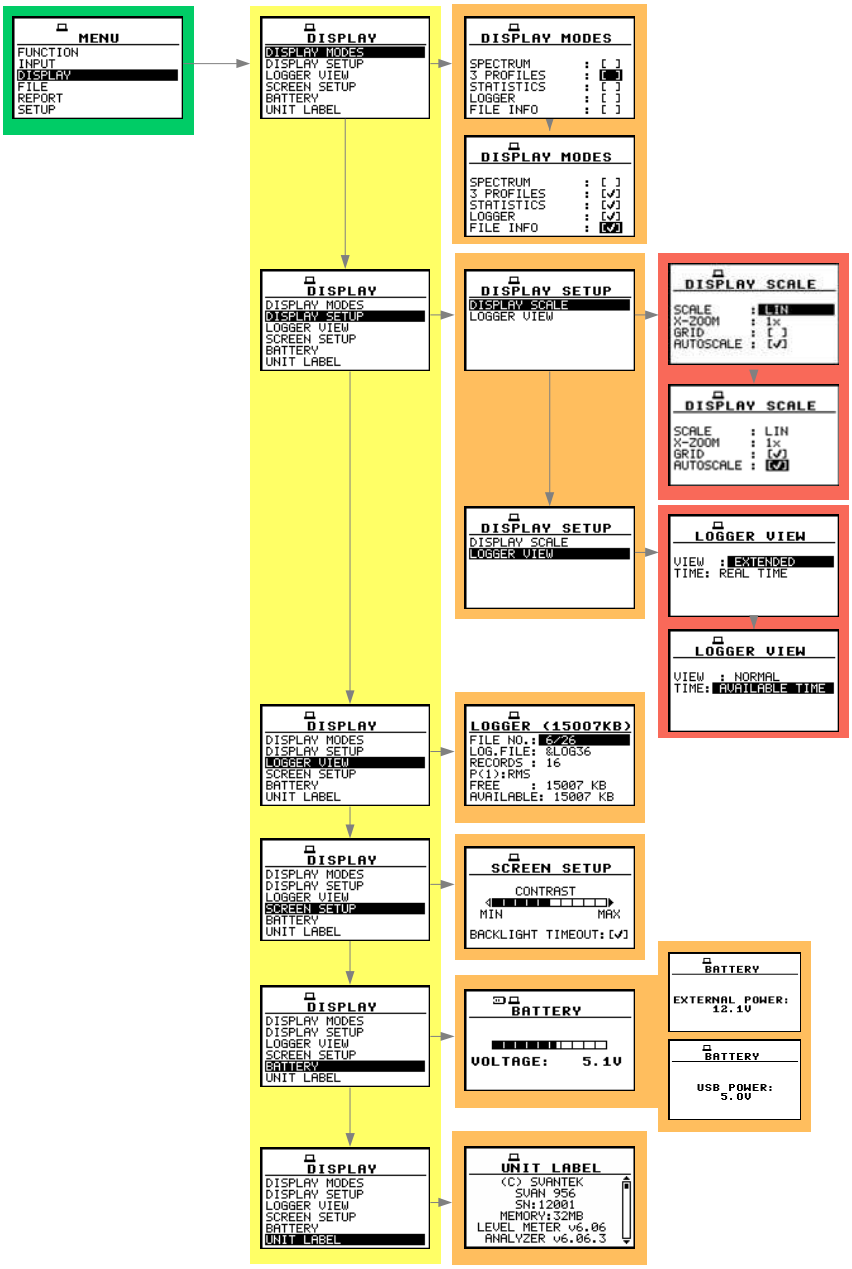
- **CONTRAST**; it enables the user to select one from twenty one possibilities of the contrast level of the instrument's display
- **BACKLIGHT TIMEOUT**, available values **[√]** or **[ ]**; if **[√]** is chosen it will cause the self-made backlight switching off in the case when the keyboard is not used during the last 30 seconds. If it happened the first pressing of any push-button switches the backlight on

➢ **BATTERY**; it informs the user about the source of powering of the instrument and current power supply voltage; available sources: **BATTERY**, **USB POWER** and **EXTERNAL POWER**

➢ **UNIT LABEL**; it informs the user about the type of the instrument, the serial number of the unit, the internal memory size, available measurement modes and it's software version and the standards which the instrument fulfils



Control diagram of the DISPLAY SETUP sublist in 1/1 OCTAVE and 1/3 OCTAVE analysis of vibration



Control diagram of the DISPLAY list

❖ **FILE** (one of the main lists available after pressing the **<MENU>** push-button)

- **SAVE: [name of the file]**; available values: **SAVE NEXT**, **SAVE**
  - **SAVE NEXT** option simplifies the way of saving the file, the file name is generated automatically, basing on the date set in the instrument or on the last name given for the file, next result is saved as a file with the name increased by one (e.g. 11JAN0, 11JAN1, 11JAN2)
  - In the **SAVE** option the name of the file can be fully edited in the **FILE NAME** window after pressing the **<▲>** push-button. The cursor is moved with **<◄>**, **<►>** push-buttons. The current character is changed with **<SHIFT>+<▲>**, **<SHIFT>+<▼>** push-buttons. The combination **<SHIFT>+<◄>** deletes the character currently pointed by the cursor
  - The combination **<SHIFT>+<►>** inserts a new character in the position of the cursor
  - **No results!** text will be displayed if the instrument did not perform any measurement in prior to choosing the **SAVE** option
- **SAVE OPTIONS** (sub-list)
  - **RAM FILE**; (only in **LEVEL METER** mode) gives the user a possibility to save data in RAM file. Each time the data are saved, the previous file is overwritten, available values **[√]** or **[ ]**
  - **REPLACE**; it enables the user to replace the existing files in the instrument's memory by the files having the same name; available values: **[√]** or **[ ]**
  - **SAVE STATISTICS**; it enables the user to save or not the calculated statistics along with the measurement results; available values: **[√]** or **[ ]**
  - **AUTO SAVE**; it enables the user to save the measurement results in the instrument's memory automatically without entering **SAVE** or **SAVE NEXT** position (in order to perform this operation the **INT. PERIOD** should be set to at least **10 s**); available values: **[√]** or **[ ]**
  - **DIRECT SAVE;** this option enables saving the results with the automatically incremented name after pressing the **<ENTER>** and **<ALT>** push-buttons together
  - **SAVE MAX SPECT.**; it enables the user to save the maximal values of the spectrum occurred during the performed analysis; available values: **[√]** or **[ ]**
  - **SAVE MIN SPECT.**; it enables the user to save the minimal values of the spectrum occurred during the performed analysis; available values: **[√]** or **[ ]**
- **LOAD**; enables one to load to the working space of the instrument's memory the measurement results saved in a file; the **NO FILES** text is displayed in the case when the instrument's memory is empty
- **DELETE**; it enables the user to verify the list of files in the memory and to delete the selected one from **RESULT FILES**, **LOGGER FILES**, **SETUP FILES** lists; the **NO FILES** text is displayed in the case when the instrument's memory is empty
- **DELETE ALL**; it enables the user to delete all files saved in the instrument's memory; user can choose to delete either **RESULT FILES**, **LOGGER FILES** or **SETUP FILES**; the confirmation is required before the erasing of all files: **„Are you sure?"**
- **DEFRAGMENTATION**;(sub list)
  - **FILES DEFRAGMENT.**; it enables the user to recover the memory, which was previously used by the deleted files; the confirmation is required before the execution of this operation: **"Are you sure?"**
  - **LOGGER DEFRAGMENT.**; it enables the user to recover the memory, which was previously used by the deleted logger files; the confirmation is required before the execution of this operation: "**Are you sure?"**

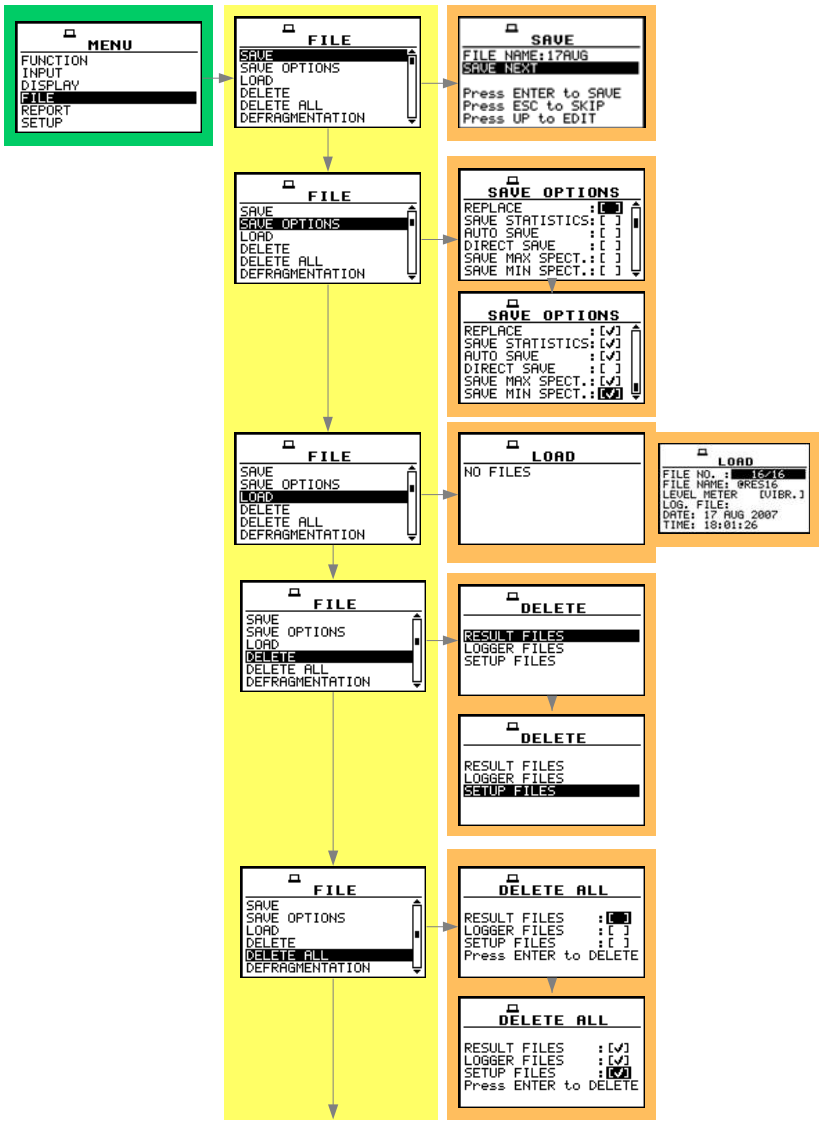
- The text **DEFRAGMENTATION .. unnecessary PRESS ANY KEY** is displayed when the instrument's memory was empty before trial of the defragmentation or when there were no deleted files

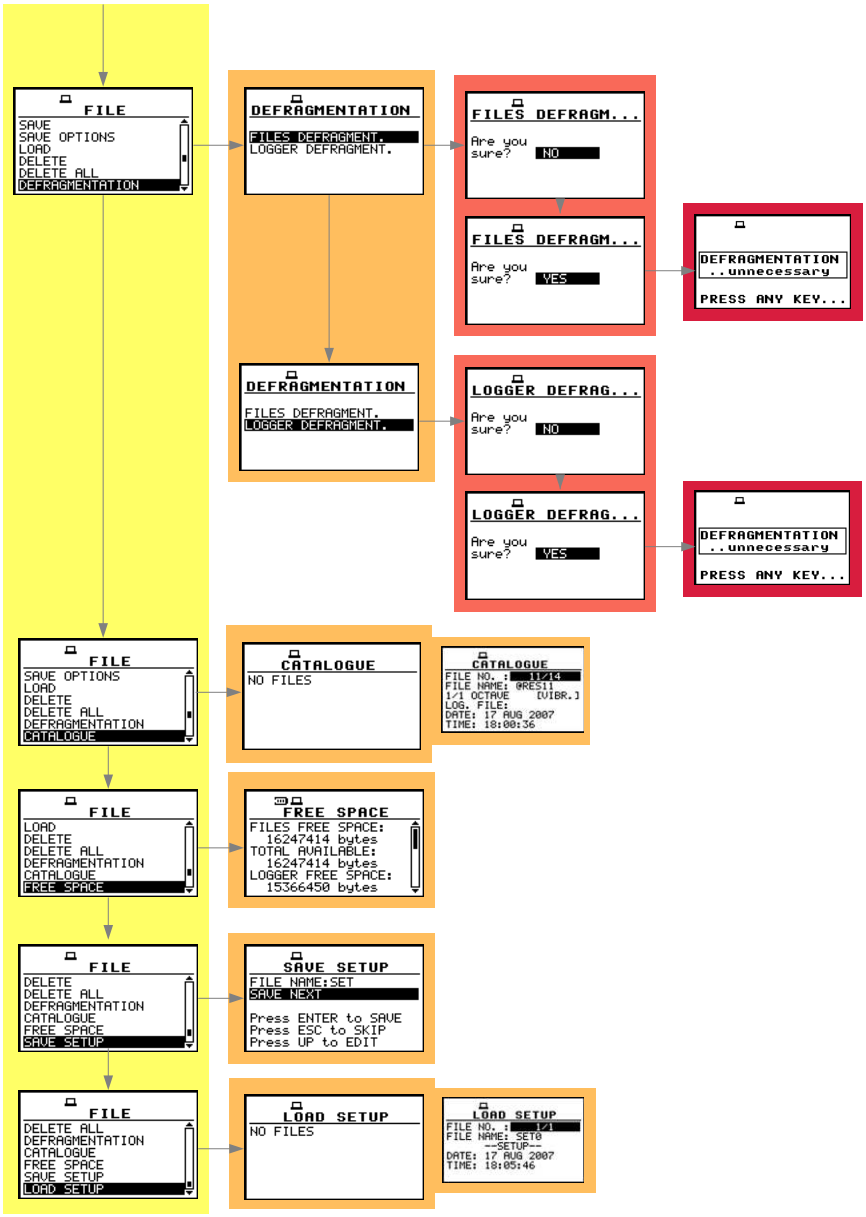
➢ **CATALOGUE**; it enables the user to verify the list of files in the memory; the **NO FILES** text is displayed in the case when the instrument's memory is empty

➢ **FREE SPACE**; it informs the user about the size of the available memory for saving the measurement results in the file **(FILES FREE SPACE**), the **TOTAL AVAILABLE** bytes of the memory (the number displayed in the **FILES FREE SPACE** increased by the memory which was previously used by the deleting files), the next two numbers given in the **FREE SPACE** window, named **LOGGER FREE SPACE** and **LOGGER AVAILABLE** characterize the logger files memory in the same way

➢ **SAVE SETUP**; saves the current settings of the instrument; with **<◄>**, **<►>** push-buttons one can choose between two modes: **SAVE NEXT** and **SAVE**. These are similar to the options available while saving result files. The **SAVE** mode enables to choose the file name manually. In the **SAVE NEXT** mode the file name will be set automatically

➢ **LOAD SETUP**; it enables the user to verify the list of setup files in the memory and to load the previously saved settings of the instrument; the **NO FILES** text is displayed in the case when there is no setup files

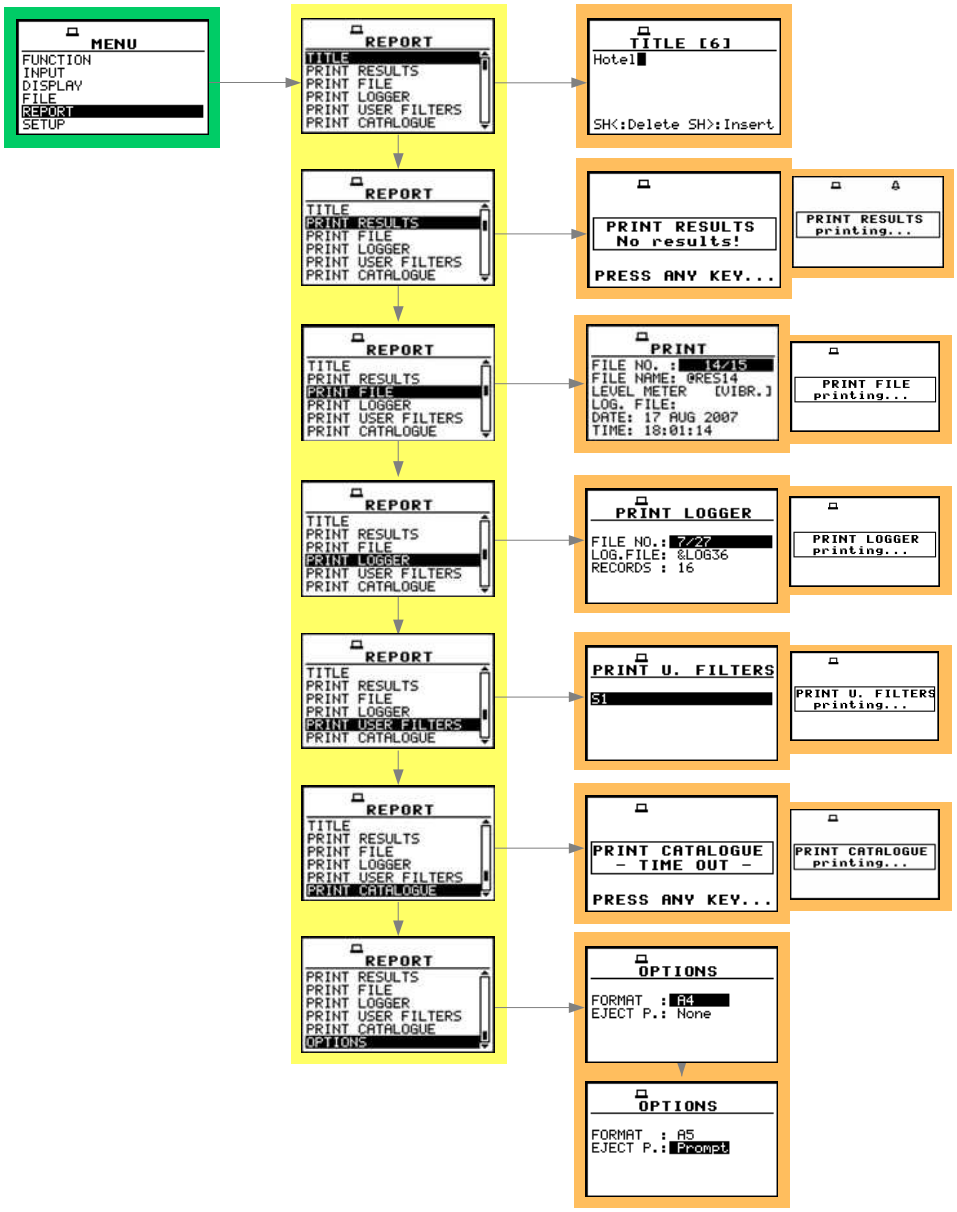




Control diagram of the FILE list

- **REPORT** (one of the main lists available after pressing the **<MENU>** push-button, to use option from this list the instrument has to be connected to RS232 or to a PC connected to a printer)
  - **TITLE**; it enables the user to give the header to the printed report
  - **PRINT RESULTS**; it enables the user to print measurement results on the attached printer, the **No results** text is displayed in the case when there is no results to be printed
  - **PRINT FILE**, it enables the user to print out on a printer connected directly to the instrument the selected file with the measurement results; the **NO FILES** text is displayed in the case when the file memory is empty
  - **PRINT LOGGER**; it enables the user to print out on a printer connected directly to the instrument the measurement results in a selected file from the logger; the **NO LOGGERS** text is displayed in the case when the instrument did not perform any measurement and the logger is empty; this function is currently under development and **FUNCTION NOT AVAILABLE** message appears on the display
  - **PRINT USER FILTERS**; it enables the user to print out on a printer connected directly to the instrument the values of the user filters introduced in the instrument: **S1**, **S2**, **S3**

- **PRINT CATALOGUE**; it enables the user to print the catalogue of the files stored in the instrument's memory
- **OPTIONS**
  - **FORMAT**; available values: **A4**, **A5**
  - **EJECT P.**; available values: **None**, **Prompt**, **Auto**



Control diagram of the REPORT list

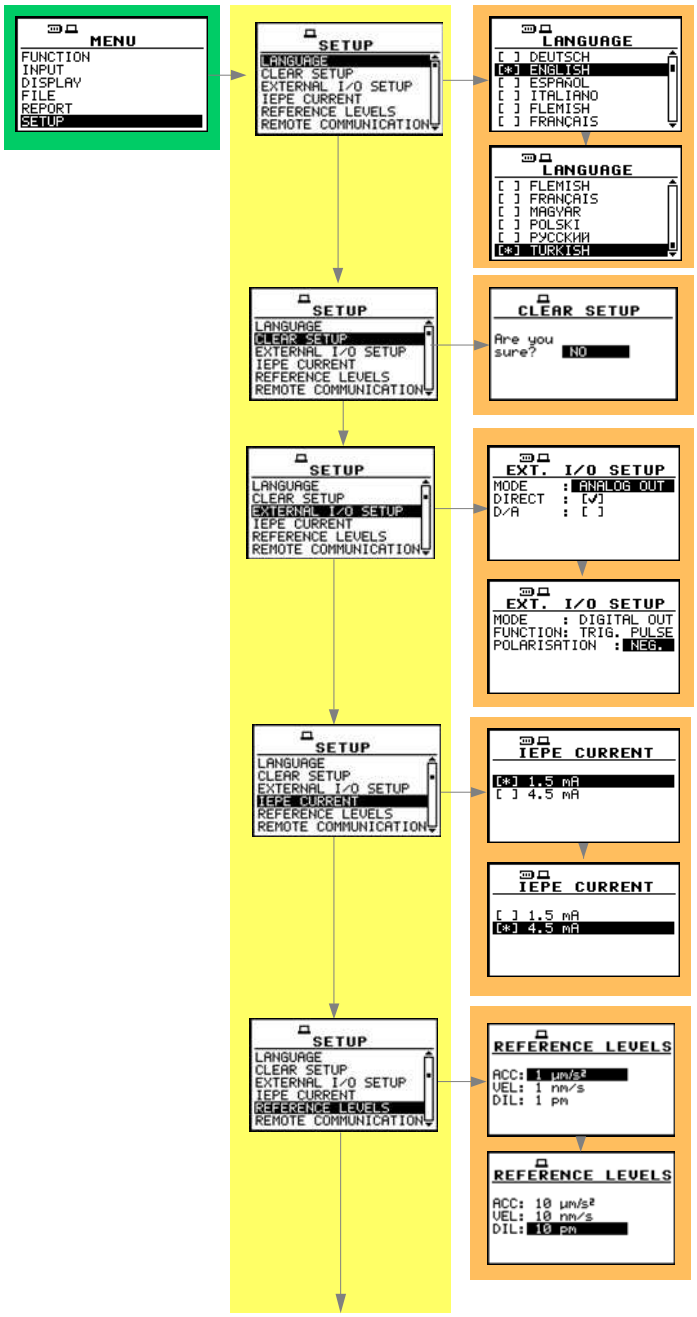
- **SETUP** (one of the main lists available after pressing the **<MENU>** push-button)
  - **LANGUAGE**; it allow the user to choose the instrument's interface language; available values: **GERMAN**, **ENGLISH**, **SPANISH**, **ITALIAN**, **FLEMISH**, **FRENCH**, **HUNGARIAN**, **POLISH, RUSSIAN**, **TURKISH**
  - **CLEAR SETUP**; it enables the user to return to the factory settings of the instrument; the confirmation has to be done before the execution of this function
    - **Are you sure?**
  - **EXTERNAL I/O SETUP**
    - **MODE**;
      - **ANALOG OUT**
        - **DIRECT** or
        - **D/A**; if set to active the next line appears
        - **SOURCE**; available sources: **A**, **C**, **Z**, **R1**, **R2**, **R3**, **1.00 Hz**, **2.00 Hz**, **4.00 Hz**, .. , **20 kHz**)
      - **DIGITAL IN**;
        FUNCTION: EXT. TRIGGER
      - **DIGITAL OUT**;
        FUNCTION:
        - **TRIG. PULSE** (**POLARISATION: POS. / NEG.**)
        - **ALARM PULSE** (**ACTIVE LEVEL**: **LOW / HIGH**, **SOURCE: PEAK(1)**, **SPL(1)**, **LEQ(1)**, **ALARM LEVEL** available values: **30.0 dB** .. **140 dB**)
  - **HUMAN VIB. FILT.;** it enables the user to activate human vibration filters with a special code , after activation of human vibration filter this position is taken off from the menu
  - **IEPE CURRENT**; it enables the user to select current IEPE supply, available values **1.5 mA** or **4.5 mA**
  - **REFERENCE LEVELS:**
    - in the case of **vibration** measurements:
      - **ACC**: - it enables the user to set the reference level of the acceleration for the logarithmic scale (the results expressed in **dB** - decibels), available levels are from **1 µm/s^2** to **100 µm/s^2**
      - **VEL**: - it enables the user to set the reference level of the velocity for the logarithmic scale (the results expressed in **dB** - decibels), available levels are from **1 nm/s** to **100 nm/s**
      - **DIL**: - it enables the user to set the reference level of the displacement for the logarithmic scale (the results expressed in **dB** - decibels), available levels are from **1 pm** to **100 pm**
  - **REMOTE COMMUNICATION**
    - **TYPE**; available values: **OFF**, **CONTINUOUS**, **PACKET**
    - **PACKET**; available values: **64, 128, 256, 512, 1024**
  - **RMS INTEGRATION**
    - **RMS INTEGRATION**; available values of detector's type: **LINEAR** or **EXPONENTIAL**
  - **RPM MEASUREMENT**, it enables the user to activate rotation measurement option; once activated the option is any longer present in the **SETUP** list
  - **RS232**;
    - **BAUD RATE**; it enables the user to set the baud rate: **1200**, **2400**, **4800**, **9600**, **19200**, **38400**, **57600**, **115200**
    - **TIME OUT**; it enables the user to set the time out: **1 s** .. **60 s**
  - **RTC**
    - **RTC**; it enables the user to set the internal real time clock and date of the instrument
  - **SHIFT MODE**
    - **SHIFT**; available modes of the **<SHIFT>** push-button: **Shift** or **2nd Fun.**
    - **ST/SP**; available modes of the **<START / STOP>** push-button: **Normal** or **Inverse**
  - **SIGNAL GENERATOR**
    - function under development , **Function not available** message appears on the display

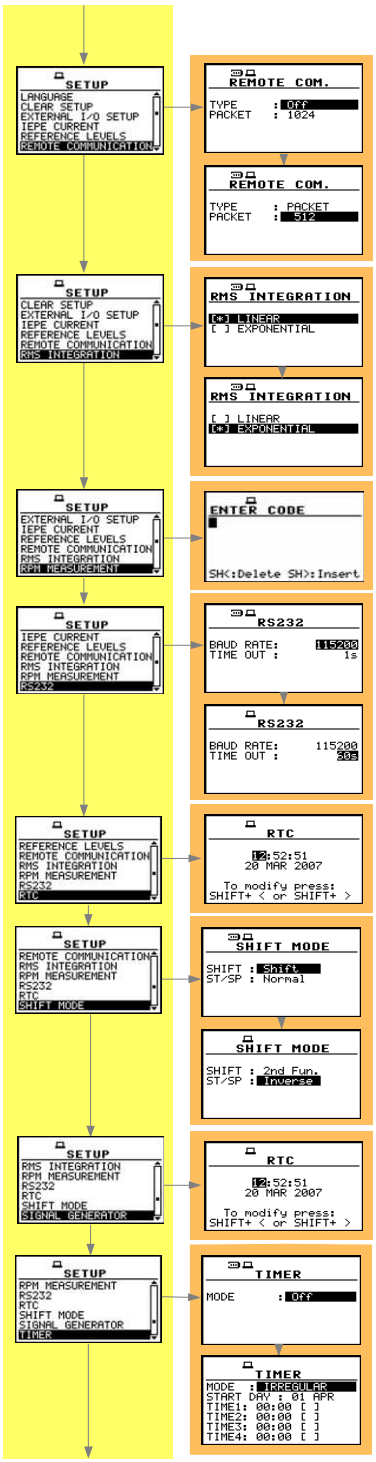
- **TIMER** (sub-list); it enables the user to set time of the self switching on of the instrument
  - **MODE**; specifies the mode of automatic power on; available values:
    - **Off**
    - **SINGLE**; (**START DAY**; specifies the date of automatic power on; **START HOUR**; specifies the time of automatic power on)
    - **REGULAR**; (**START DAY**; specifies the date of automatic power on; **START HOUR**; specifies the time of automatic power on, **REPETITION**; specifies time after which next automatic measurement will be executed)
    - **IRREGULAR**; (**START DAY**; specifies the date of automatic power on; **TIMEx**; enables the user to specify four times of automatic measurements)
- **USB–HOST PORT**; it enables the user to choose with [*] proper functionality of USB–HOST socket for connection of the instrument to **RS232**, **USB IRDA**, **USB DISK**, **SRT RECORDING**, **WAVE RECORDING**, **EVENT RECORDING**
- **USER FILTERS**; it enables the user to introduce the coefficients of the filters
  - **REAL TIME FILTERS**
    - **Rx** (**R1**, **R2**, **R3**)
      - **TYPE**; available values: **HIGHPASS**, **BANDPASS**, **LOWPASS**
      - **LFC(3 dB**); low frequency corner at 3 dB; available for **HIGHPASS** and **BANDPASS** with the values: **100.00 Hz** .. **10.00 kHz**
      - **HFC(3 dB)**; high frequency corner at 3 dB; position available only for **BANDPASS** and **LOWPASS** with the values: **100.00 Hz** .. **10.00 kHz**
  - **SPECTRUM BASED FILTER**
    - **VIEW** it enables the user to select which filter used in **1/1 OCTAVE** or **1/3 OCTAVE** analysis should be viewed; the available options are **S1**, **S2**, **S3** and any other transmitted to the instrument from a PC by means of the interface
    - **EDIT** it enables the user to select which filters used in **1/1 OCTAVE** or **1/3 OCTAVE** analysis should be edited; the available options are as follows: **S1**, **S2**, **S3** or any other transmitted to the instrument from a PC by means of the interface

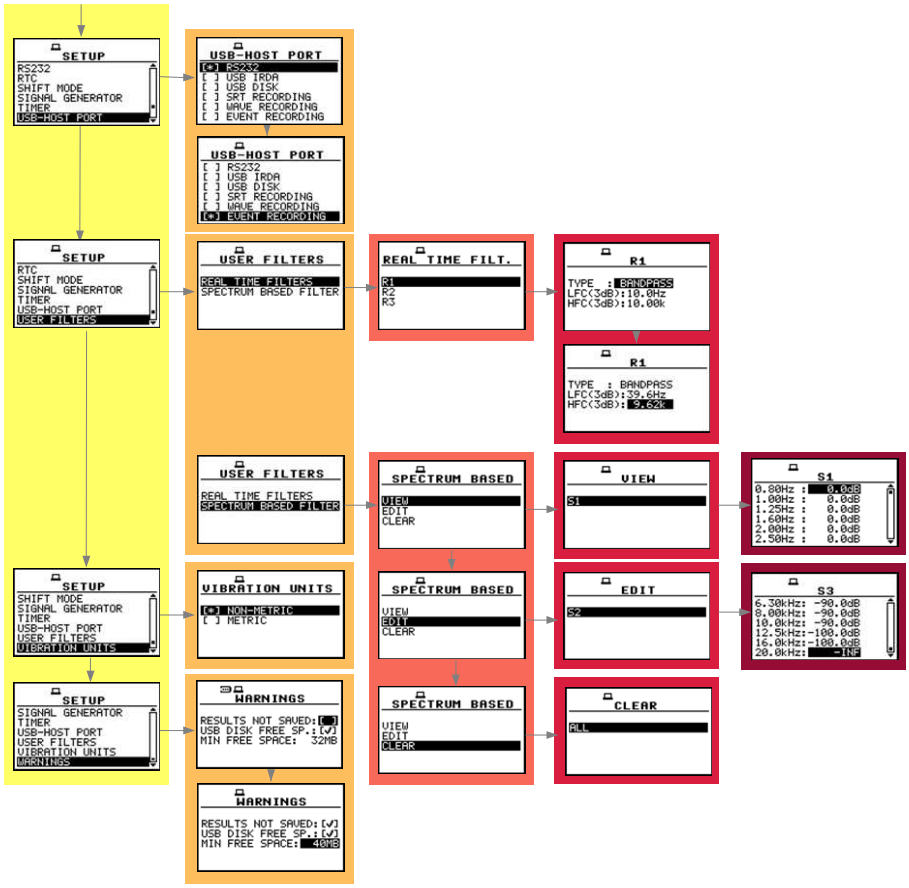
      After pressing the **<ENTER>** push-button the **Sx** (**S1**, **S2**, **S3**) sub-list is opened containing the values of the filters; the user can set the values of correcting coefficients for all **1/3 OCTAVE** filters:

      - **0.80 Hz:** available values of 0.8 Hz centre frequency filter: **-100.0dB** .. **100.0dB**
      - **...**
      - **…**
      - **20.0 kHz:** available values of 20 kHz centre frequency filter: **-100.0dB** .. **100.0dB**

    - **CLEAR**, enables the user to select which filters should be cleared; the available options are as follows: **ALL**, **S1**, **S2**, **S3** or any other
- **VIBRATION UNITS** (sub-list which has the meaning only for vibration measurements)
  - **METRIC** (e.g. **m/s^2**, **m/s**, **m**) (position); available values: **[ ]** / **[*]**
  - **NON-METRIC** (e.g. **g**, **ips**, **mil**) (position); available values: **[ ]** / **[*]**
- **WARNINGS**
  - **RESULTS NOT SAVE**; it enables the user to switch on or off the warning that the results of the measurement were not saved in the memory; available values: **[√]** or **[ ]**
  - **USB DISK FREE SP.**; it enables to generate a warning after checking free space on the USB disk
  - **MIN FREE SPACE**; specifies the limit of available memory for warning; if the available memory is not greater than that limit the warning will be displayed; available values: **1 MB** .. **1024 MB**


MENU
FUNCTION
INPUT
DISPLAY
FILE
REPORT
SETUP
SETUP
LANGUAGE
CLEAR SETUP
EXTERNAL I/O SETUP
IEPE CURRENT
REFERENCE LEVELS
REMOTE COMMUNICATION
LANGUAGE
[ ] DEUTSCH
[*] ENGLISH
[ ] ESPANOL
[ ] ITALIANO
[ ] FLEMISH
[ ] FRANÇAIS
LANGUAGE
[ ] FLEMISH
[ ] FRANÇAIS
[ ] MAGYAR
[ ] POLSKI
[ ] РУССКИЙ
[*] TURKISH
SETUP
LANGUAGE
CLEAR SETUP
EXTERNAL I/O SETUP
IEPE CURRENT
REFERENCE LEVELS
REMOTE COMMUNICATION
CLEAR SETUP
Are you sure? NO
SETUP
LANGUAGE
CLEAR SETUP
EXTERNAL I/O SETUP
IEPE CURRENT
REFERENCE LEVELS
REMOTE COMMUNICATION
EXT. I/O SETUP
MODE : ANALOG OUT
DIRECT : [✓]
D/A : [ ]
EXT. I/O SETUP
MODE : DIGITAL OUT
FUNCTION: TRIG. PULSE
POLARISATION : NEG.
SETUP
LANGUAGE
CLEAR SETUP
EXTERNAL I/O SETUP
IEPE CURRENT
REFERENCE LEVELS
REMOTE COMMUNICATION
IEPE CURRENT
[*] 1.5 mA
[ ] 4.5 mA
IEPE CURRENT
[ ] 1.5 mA
[*] 4.5 mA
SETUP
LANGUAGE
CLEAR SETUP
EXTERNAL I/O SETUP
IEPE CURRENT
REFERENCE LEVELS
REMOTE COMMUNICATION
REFERENCE LEVELS
ACC: 1 μm/s²
VEL: 1 nm/s
DIL: 1 pm
REFERENCE LEVELS
ACC: 10 μm/s²
VEL: 10 nm/s
DIL: 10 pm


SETUP
LANGUAGE
CLEAR SETUP
EXTERNAL I/O SETUP
IEPE CURRENT
REFERENCE LEVELS
REMOTE COMMUNICATION
REMOTE COM.
TYPE : Off
PACKET : 1024
REMOTE COM.
TYPE : PACKET
PACKET : 512
SETUP
CLEAR SETUP
EXTERNAL I/O SETUP
IEPE CURRENT
REFERENCE LEVELS
REMOTE COMMUNICATION
RMS INTEGRATION
RMS INTEGRATION
(•) LINEAR
( ) EXPONENTIAL
RMS INTEGRATION
( ) LINEAR
(•) EXPONENTIAL
SETUP
EXTERNAL I/O SETUP
IEPE CURRENT
REFERENCE LEVELS
REMOTE COMMUNICATION
RMS INTEGRATION
RPM MEASUREMENT
ENTER CODE
SHC:Delete SH>:Insert
SETUP
IEPE CURRENT
REFERENCE LEVELS
REMOTE COMMUNICATION
RMS INTEGRATION
RPM MEASUREMENT
RS232
RS232
BAUD RATE: 115200
TIME OUT : 1s
RS232
BAUD RATE: 115200
TIME OUT : 30s
SETUP
REFERENCE LEVELS
REMOTE COMMUNICATION
RMS INTEGRATION
RPM MEASUREMENT
RS232
RTC
RTC
12:52:51
20 MAR 2007
To modify press:
SHIFT+ < or SHIFT+ >
SETUP
REMOTE COMMUNICATION
RMS INTEGRATION
RPM MEASUREMENT
RS232
RTC
SHIFT MODE
SHIFT MODE
SHIFT : Shift
ST/SP : Normal
SHIFT MODE
SHIFT : 2nd Fun.
ST/SP : Inverse
SETUP
RMS INTEGRATION
RPM MEASUREMENT
RS232
RTC
SHIFT MODE
SIGNAL GENERATOR
RTC
12:52:51
20 MAR 2007
To modify press:
SHIFT+ < or SHIFT+ >
SETUP
RPM MEASUREMENT
RS232
RTC
SHIFT MODE
SIGNAL GENERATOR
TIMER
TIMER
MODE : Off
TIMER
MODE : IRREGULAR
START DAY : 01 APR
TIME1: 00:00 [ ]
TIME2: 00:00 [ ]
TIME3: 00:00 [ ]
TIME4: 00:00 [ ]



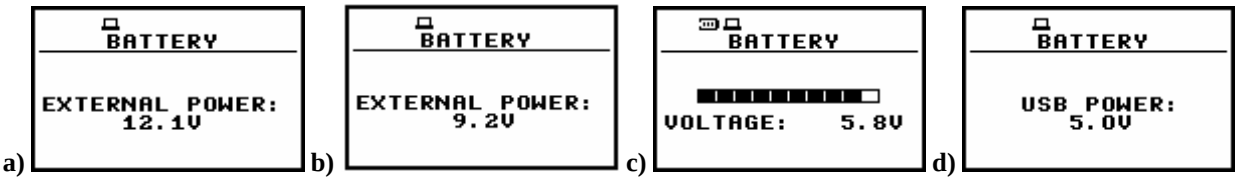
Control diagram of the SETUP list

3.2 Powering of the instrument

The **SVAN 956** can be powered by one of the following sources:

- **External DC power** source – 6 V DC÷15 V DC (1.5 W)
- **SA 17A external battery pack** – operation time > 24 h (option)
- Four AA standard internal **batteries**. In the case of alkaline type, fully charged set can operate more than 12 h (6.0 V / 1.6 Ah). Instead of the ordinary, four AA rechargeable **batteries** can be used (for charging them the separate charger is required). In this case, using the best NiMH type, the operation time can be increased up to 16 h (4.8 V / 2.6 Ah)
- **USB** interface – 500 mA HUB

The **BATTERY** window (*path: MENU / DISPLAY / BATTERY*) looks differently, depending on the current powering source



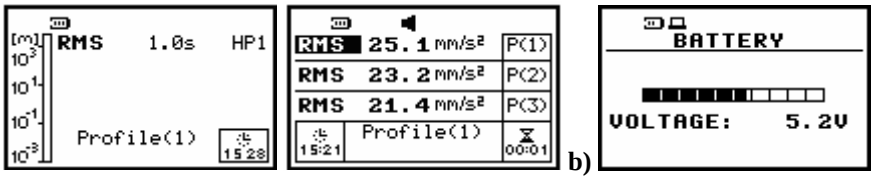
BATTERY windows with different sources powering the instrument: SA 15 external DC power adapter (a), SA 17A external battery pack (b), internal batteries (c) and USB power (d)

For the external powering the **SA 15** adapter should be connected to the **Power** socket located on the bottom cover of the instrument. When the instrument is powered from the external power supply or by the USB interface, the red diode on the right corner of the front panel bottom of the device switches on. In the case of **SA 15** the **EXTERNAL POWER** message appears in the **BATTERY** window (*path: MENU / DISPLAY / BATTERY*).

When the instrument is powered from batteries, the **"Battery"** icon is presented on the top of the display. When voltage of the batteries is too low, the icon is flashing and during attempt of switching on the **LOW BATTERY** message occurs on the display for 2 seconds and the instrument switches off by itself. To change the batteries the user has to:

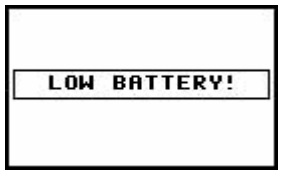
- switch off the instrument,
- take off the black bottom cover of the instrument,
- unscrew battery cover,
- change the batteries and
- reassemble the parts of the instrument.

The fully charged battery ensures more than 12 hours of the continuous work of the instrument (with the backlight off). The operation time is decreased about 20 % with the backlight switched on. The battery condition can be checked by means of the **POWER SUPPLY** function. It is also presented continuously on the display by means of the **"Battery"** icon.

a) 

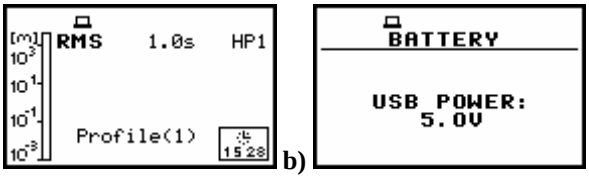
b)

Displays with the "Battery" icon (a) and in the BATTERY window *(path: MENU / DISPLAY / BATTERY)* (b)



Display with LOW BATTERY message

When there is a connection to the USB interface (**USB Device** socket is connected by means of the cable to a PC), the **"Computer"** icon is presented on the top of the display and in the **BATTERY** window, there is the **USB POWER 5.0 V** message.

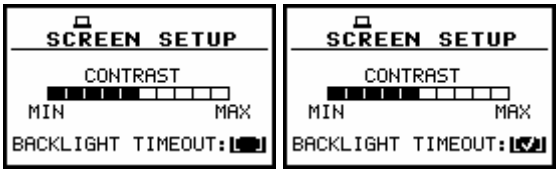
a) 

b)

Displays with the "Computer" icon (a) and in the BATTERY window (b)

Notice: *In the case when **"Battery"** icon is flashing, it is strongly recommended to use as soon as possible the external power adapter or USB interface. In the other case the instrument after a while will be switched off by itself!*

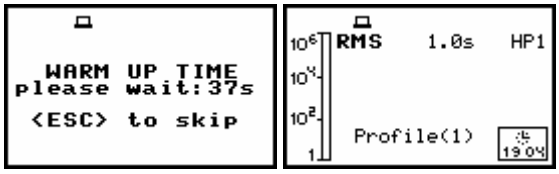
The backlight of the display can be activated by means of the **<◄>** + **<►>** push-buttons pressed together. For saving the power of the battery, in the normal "day-light" operation it is recommended to **keep the backlight off.** The user can set the **BACKLIGHT TIMEOUT** (*path: MENU / DISPLAY / SCREEN SETUP / BACKLIGHT TIMEOUT*), which will cause the self-made backlight switching off in the case when the keyboard is not used during the last 30 seconds. If it happened the first pressing of any push-button switches the backlight on.



SCREEN SETUP windows; BACKLIGHT TIMEOUT activation

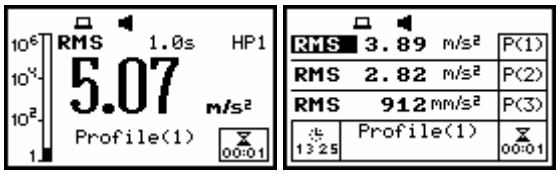
3.3 Initial setup of the instrument

The instrument passes the self-test after switching on (in this time the producer and the name of the instrument is displayed on the display) and then it enters the vibration mode. The default display mode for result's presentation is one profile.



Displays after switching on the instrument

To start the measurements the user has to press the **<START /STOP**> push-button. The result of the measurement is displayed with the unit of the measurement in so-called one profile mode. On the left side of the display, the analogue-like indicator is presented. On the bottom of the display, there is a profile from which comes the measurement (**Profile (1)**, **Profile (2)** or **Profile (3)**). On the top of the display (under the icons line) there are the following data: the function name (**RMS**, **VDV**, **OVL**, **PEAK**, **P–P**, **MTVV**), the detector time constant (**100 ms**, **125 ms**, .. **10.0 s**, .. - when the detector is exponential or **Lin** when the detector is linear) and the weighted filter (**HP1**, **HP3**, **HP10**, **Vel1**, **Vel3**, **Vel10**, **VelMF**, **Dil1**, **Dil3**, **Dil10**, **KB**, **Wk**, **Wd**, **Wc**, **Wj**, **Wm**, **Wh**, **Wg**, **Wb, R1, R2, R3**). The real time clock / time of the measurement are presented on the right side of the bottom.



Displays in one profile (a) and 3 PROFILES display mode (b) with the VLM measurement results

The results of the measurements can be presented in one profile, in **3 PROFILES** and in **LOGGER** (these are the available display modes set by the producer; cf. *path: MENU / DISPLAY / DISPLAY MODES*). It is also possible to activate **FILE INFO** display mode (*path: MENU / DISPLAY / DISPLAY MODES / FILE INFO*). It is possible to change the display mode pressing the **<▲>** or **<▼>** push-buttons together with the **<SHIFT>** one. In so-called **3 PROFILES** display mode the results of the measurement from all profiles are displayed simultaneously. The units, weighted filter and detector time constant are also shown. The default settings (set up by the producer) for the profiles are as follows:

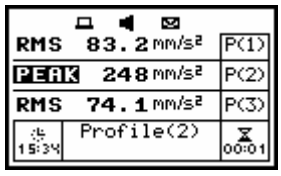
PROFILE 1 - **HP1** weighting filter (**FILTER: HP1**); **1.0s** type of the RMS detector (**DETECTOR: 1.0s**), the results of the measurements are not stored in the logger's file (**LOGGER PEAK: [ ]**, **LOGGER P–P: [ ]**, **LOGGER MAX: [ ]**, **LOGGER RMS: [ ]**);

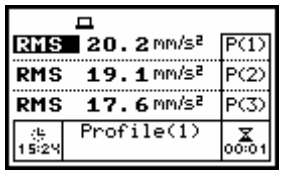
PROFILE 2 - **HP3** weighting filter (**FILTER: HP3**), **1.0s** type of the RMS detector (**DETECTOR: 1.0s**), the results of the measurements are not stored in the logger's file (**LOGGER PEAK: [ ]**, **LOGGER P–P: [ ]**, **LOGGER MAX: [ ]**, **LOGGER RMS: [ ]**);

PROFILE 3 - **HP10** weighting filter (**FILTER: HP10**), **1.0s** type of the RMS detector (**DETECTOR: 1.0s**), the results of the measurements are not stored in the logger's file (**LOGGER PEAK: [ ]**, **LOGGER P–P: [ ]**, **LOGGER MAX: [ ]**, **LOGGER RMS: [ ]**);

The user can change all mentioned above settings using **PROFILE x** sub-list of the **INPUT** list. The instrument remembers all changes. The return to the default settings (set up by the producer) is possible after the execution of the **CLEAR SETUP** position available in the **SETUP** list.

The instrument can be used not only as the vibration level meter (**VLM**) but also as **1/1 OCTAVE** and **1/3 OCTAVE** analyser, **FFT** analyser and perform **ENVELOPING** function. In order to distinguish the **LEVEL METER** function from the others, which are available in **3 PROFILES** display mode, two continuous horizontal lines are used to separate the measurement results from different profiles. In other modes than **VLM** the mentioned above lines are dotted.

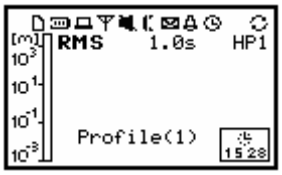
a) 

b) 

Displays in 3 PROFILES display mode with the measurements results, which are from LEVEL METER mode (continuous lines) (b) and with the results, which are not from the LEVEL METER (dotted lines)

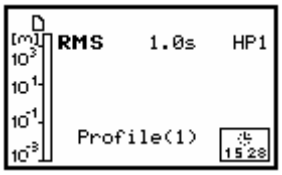
Notice: *See next chapters for more details concerning different settings.*

More data about the instrument's state are given by means of the icon's row visible in the top of the display (**"Paper sheet"**, **"Battery"**, **"Computer"**, **"Antenna"** (**"Tree"**), **"Loudspeaker"**, **"Headphone"**, **"Envelope"**, **"Bell"**, **"Timer"** and **"Arrows"**). The meanings of the icons are as follows:



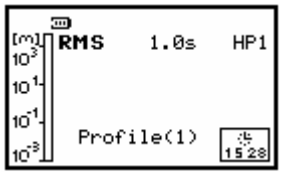
Display with all available icons

"Paper sheet" icon is displayed when the USB disk or IrDA is connected to the instrument.



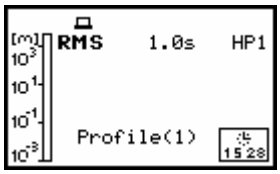
Display with "Paper sheet" icon

"Battery" is displayed when the instrument is powered from the batteries, icon corresponds to the batteries **state** (three, two, one or none vertical bars in side of the icon). When voltage of batteries is too low, the icon is flashing.



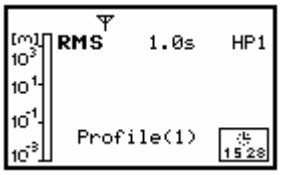
Display with "Battery" icon

"Computer" is displayed when there is the USB connection with the PC; the icon is flashing during RT (Real Time) transmission.



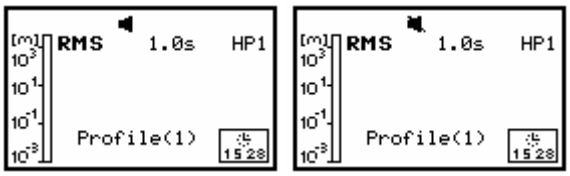
Display with "Computer" icon

"Antenna" (**"Tree"**) icon is displayed in a flashing mode together with the "**Loudspeaker**" when the measurement is started, the trigger is switched on and the level of the signal is too low to start the registration.



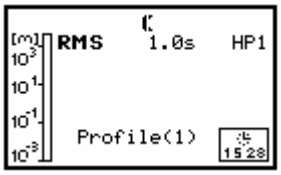
Display with "Antenna" ("Tree") icon

"Loudspeaker" icon is displayed when the measurement is started and executed. The crossed out loudspeaker means measurement is paused (Pause).



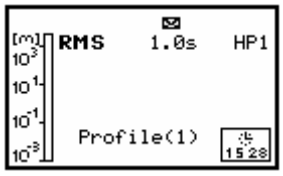
Display with "Loudspeaker" icon

"Headphone" is displayed when RS 232 (**SV 55**) interface is connected to the instrument.



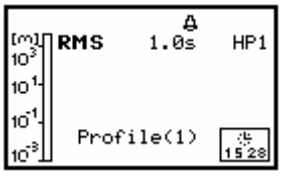
Display with "Headphone" icon

"Envelope" icon is presented when the current **measurement results are logged** in the instrument's logger file. Together with this icon, the **"Loudspeaker"** icon is always displayed. In the case when the **"Envelope"** icon starts flashing, it means that the whole logger memory of the instrument is filled out. The new measurement result is not saved in it. If the user wants to save these results, he has to **DELETE** some logger files and execute **LOGGER DEFRAGMENTATION** (*path: MENU / FILE / DEFRAGMENTATION / LOGGER DEFRAGMENTATION*).



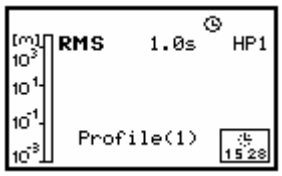
Display with "Envelope" icon

"Bell" is displayed when overload has taken place during the last measurement cycle (the icon is displayed also after the measurement and after loading the file with the overloaded results).



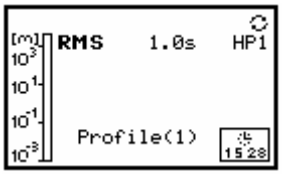
Display with "Bell" icon

"Timer" icon flashing means that the instrument's **Timer** is switched on and the instrument is waiting for the set time of the measurement. When the measurement was started by the **Timer,** the icon is presented without flashing.



Display with "Timer" icon

"Arrows" are flashing after pressing the **<ALT>** or **<SHIFT>** push-button when the **2nd Fun** is selected in the **SHIFT MODE** (*path: MENU / SETUP / SHIFT MODE / SHIFT / 2nd FUN*), that means other push-buttons have second or third meaning (i.e. after pressing the **<SHIFT>** the meaning of **<ENTER>** push-button is **<MENU>**; after pressing the **<ALT>** the meaning of **<ESC>** push-button is changed into **<PAUSE>**).



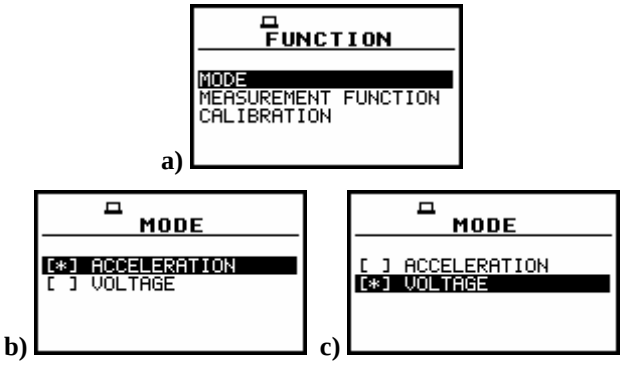
Display with "Arrows" icon

Notice: *The time of the measurement is displayed* ***in minutes and seconds*** *in the range from* ***1 sec. to 39 minutes and 59 seconds****. After this limit, the hours and minutes are shown (i.e. 00:40).*

Notice: THE USER DYNAMICALLY MODIFIES THE DEFAULT SETUP. *The last set-up of the instrument (during the power off) is stored and is available after power on.*

3.4 Selection of the working mode- MODE

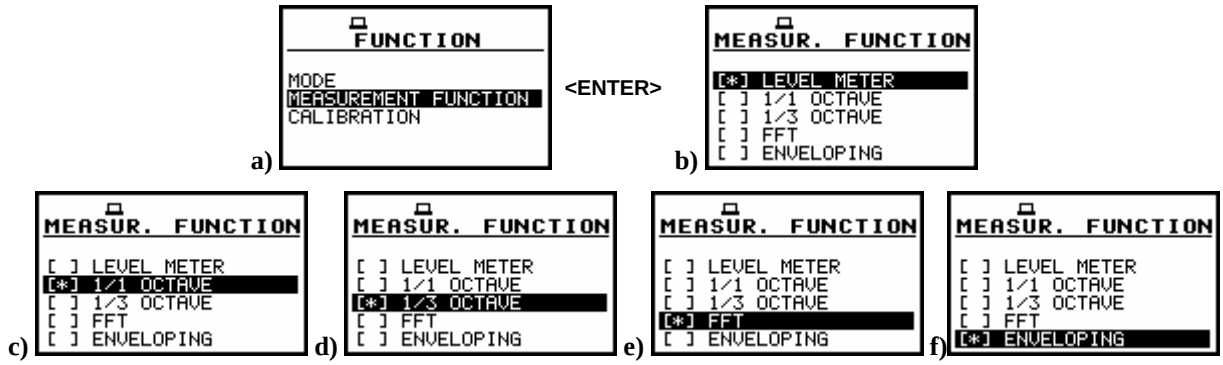
The device can work in two modes – acceleration and voltage. A mode is selected by placing the special character in the line with the mode's name. The position of the character can be changed using the **<▲>**, **<▼>** push-buttons. After placing the character in the line with the option's name the user has to press the **<ENTER>** push-button.



Displays with the FUNCTION list opened, MODE selected (a) and MODE sub-list opened with ACCELERATION (b) and VOLTAGE (c) mode selected

3.5 Activation of optional functions

The **1/1 OCTAVE**, **1/3 OCTAVE**, **FFT**, **ENVELOPING** and **time history data LOGGER**, **time domain signal recording**, **human vibration filters**, **RPM**, **SIGNAL GENERATOR** are the optional functions broadening the applications of the instrument. Some of the additional functions are specified in the **MEASUR. FUNCTION** (*path: MENU / FUNCTION*) others – in the other lists.



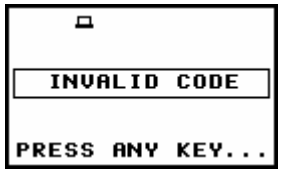
Displays with the FUNCTION list opened, MEASUREMENT FUNCTION selected (a) and MEASUR. FUNCTION sub-list opened with all available options (b), (c), (d), (e), (f)

A function is selected by placing the special character in the line with the function's name. The position of the character can be changed using the **<▲>**, **<▼>** push-buttons. After placing the character in the line with the function's name the user has to press the **<ENTER>** push-button. The window for entering the access code to a function is opened in the first essay of its execution (after pressing the **<ENTER>** push-button) in the case when a function was not purchased together with the instrument.

Displays during the entering of the access code to a function

Notice: *The number of the attempts for the access code entering is limited. After three unsuccessful essays, the possibility is blocked.*

The introduction of the access code is performed in the same way as the edition of the other text variables using the **<◄>**, **<►>** push-buttons (the selection of the character's position), the **<SHIFT>** and **<►>** push-buttons (the **Insert** function), the **<SHIFT>** and **<◄>** push-buttons (the **Delete** function) and the **<▲>**, **<▼>** push-buttons (the codes of characters). The verification is made after pressing the **<ENTER>** push-button. If the entered code was wrong, the message is displayed and the instrument waits for the reaction of the user. After pressing the **<ENTER>** or the **<ESC>** push-button the information that the function is not available is displayed and the instrument once more waits for the reaction of the user.



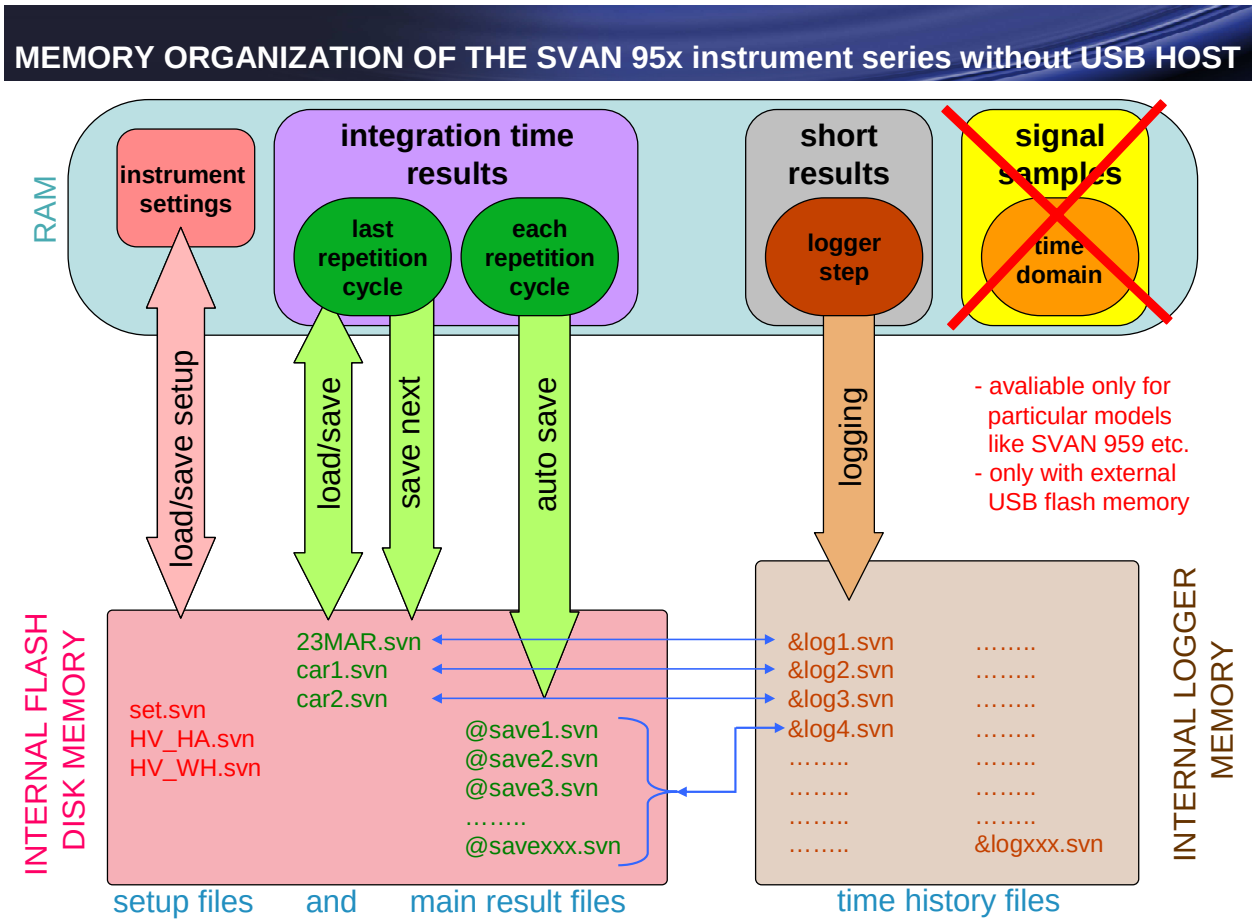
Display after the unsuccessful verification of the access code

After pressing the **<ENTER>** or the **<ESC>** push-button the instrument returns to the **FUNCTION** list displaying the list of the functions implemented in the unit (cf. the first Figure in this chapter). After successful verification of the access code, the windows described above are no more displayed. Once activated function is always available.

3.6 Memory organisation

All available measurement results can be stored in the internal FLASH type memory of the instrument (32 MB) or in the external USB Memory Stick (when the optional **USB–HOST** controller is installed in the instrument).

The internal memory of the instrument is divided into two separate parts. One part is dedicated for saving the **result** and **setup** files and its size is equal to 16 252 428 bytes. The second part is used for saving the logger files and its size is equal to 15 859 224 bytes. To save a **result file** the user has to choose one of the available options: **SAVE NEXT** (*path: MENU / FILE / SAVE* or pressing **<ENTER>** and **<ALT>** together), **SAVE** (*path: MENU / FILE / SAVE* or pressing **<ENTER>** and **<ALT>** together), **AUTO SAVE** (*path: MENU / FILE / SAVE OPTIONS*) or **DIRECT SAVE** (*path: MENU / FILE / SAVE OPTIONS*). To save a setup file the user has to choose **SAVE SETUP** option from the **FILE** list. The **logger files** are created automatically (the usage of the **SAVE** is not required). The scheme of the instrument's memory organisation without the **USB–HOST** controller is presented below.

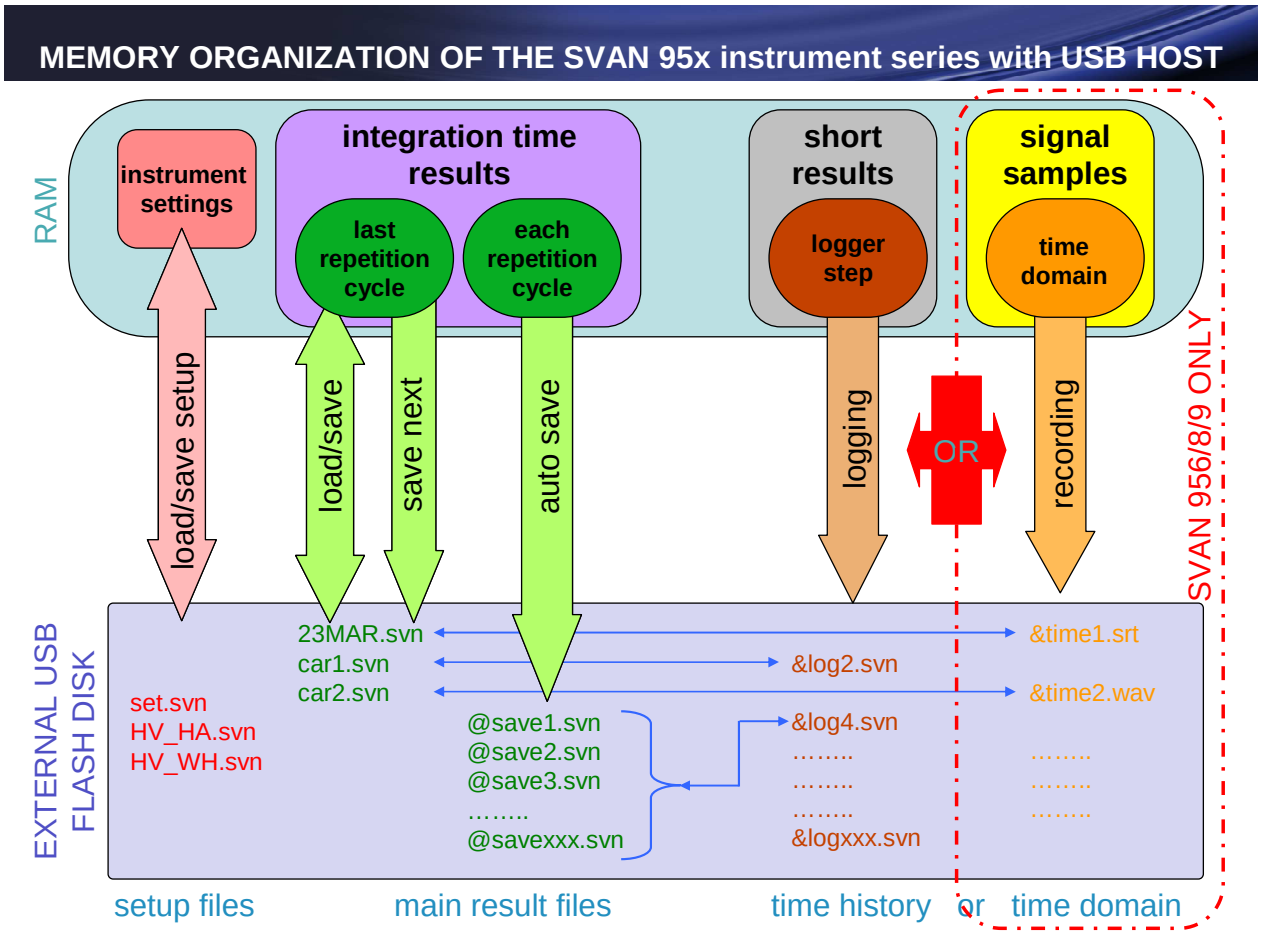


Scheme of the instrument's memory organisation without the USB–HOST

Notice: The instrument's logger memory is independent from the results and setup memory. *The capacity of the available memory is equal to 32 MB and is divided between logger (15 859 224 bytes) and results and setup settings (16 252 428 bytes).*

Notice: *The* ***logger*** *files are created automatically (the usage of the* ***SAVE*** *is not required).*

When the user connects to the instrument the **USB memory stick**, the data storing in the internal instrument's memory is not available any more. The user can only copy or move data from the internal memory of the device and store new data in the **USB memory stick**. The scheme of the memory organization of the instrument with the USB memory stick connected is presented below.



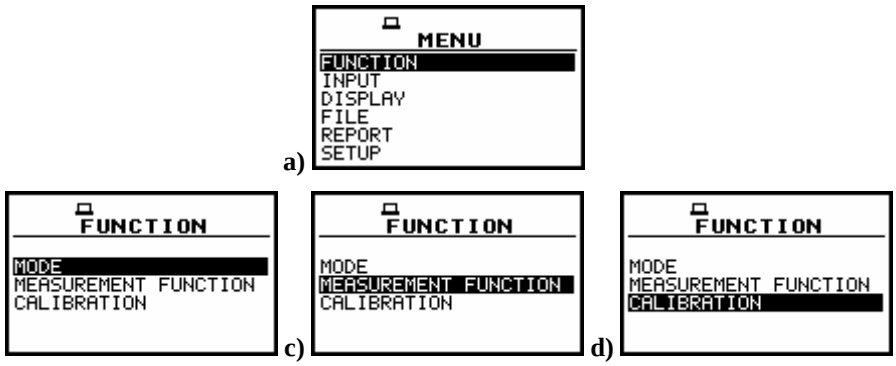
Scheme of the instrument's memory organisation with the USB–HOST and memory stick connected

Notice: *The connection to the* ***USB Host*** *socket the USB disk switches off the instrument's internal flash memory. Only copying and moving the files to the USB stick is possible. All file functions and remote commands are redirected to the USB disk. The internal flash memory is activated after disconnecting the USB disk from the instrument.*

Notice: *The disconnection of the USB disk during the data transmission can cause the lost of data saved in the USB disk as well as in the instrument's internal flash memory.*

4 FUNCTIONS OF THE INSTRUMENT - FUNCTION

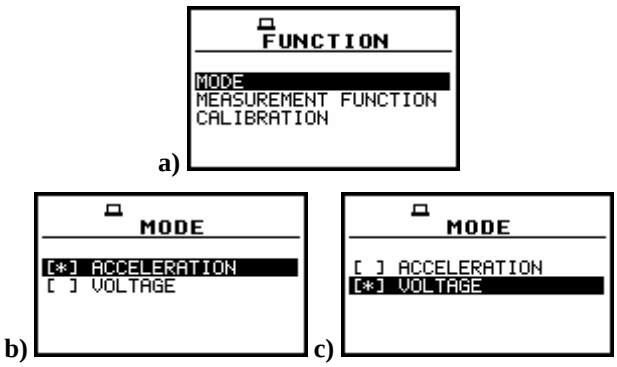
In order to select the **FUNCTION** list one has to press the **<MENU>** push-button, select by means of the **<▲>**, **<▼>** (or **<◄>**, **<►>**) push-buttons the **FUNCTION** text and press the **<ENTER>**. The **FUNCTION** list contains three elements: **MODE**, **MEASUREMENT FUNCTION** and **CALIBRATION**. The list is closed and the instrument returns to the presentation mode after pressing the **<ESC>** push-button.



Displays with the main list; the FUNCTION text selected (a) and the FUNCTION list opened; the MODE selected (b) the MEASUREMENT FUNCTION selected (c) and the CALIBRATION selected (d)

4.1 Selecting the mode of the instrument - MODE

In order to select the required mode the user has to enter the **MODE** position in the **FUNCTION** sub-list using **<▲>**, **<▼>** push-buttons and press the **<ENTER>** one. A mode is selected by placing the special character in the line with the mode's name. The position of the character can be changed using the **<▲>**, **<▼>** push-buttons. After placing the character in the line with the option's name the user has to press the **<ENTER>** push-button.

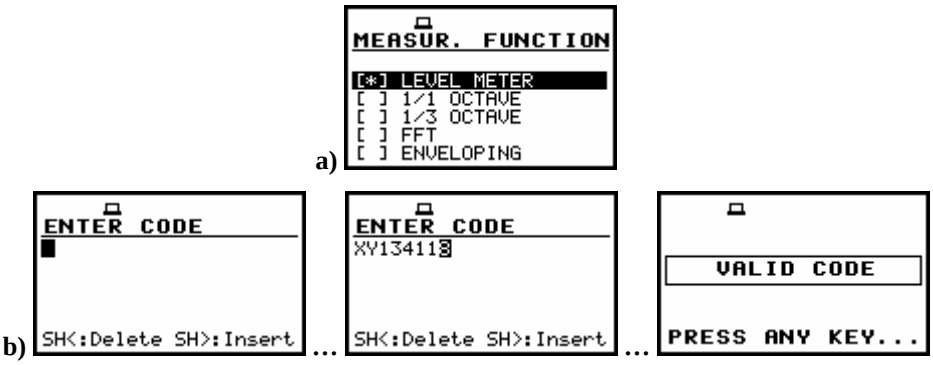


FUNCTION list opened; MODE selected (a) and MEASUR. FUNCTION sub-list opened with all available modes b), (c)

4.2 Measurement functions of the instrument - MEASUREMENT FUNCTION

In order to select the required function the user has to enter the **MEASUREMENT FUNCTION** sub-list (to select the **MEASUREMENT FUNCTION** text using the **<▲>**, **<▼>** or **<◄>**, **<►>** push-buttons and press the **<ENTER>** one, when this text is displayed inversely).

After entering the **MEASUREMENT FUNCTION** sub-list, the set of the available functions appears on the display (**LEVEL METER**, **1/1 OCTAVE**, **1/3 OCTAVE**, **FFT**, **ENVELOPING**). The special character marks currently active function.



MEASUREMENT FUNCTION windows opened (a) and the activation of the optional function (b)

The main function of the instrument is the **measurement of vibration level**. The other functions are optional and they broaden the applications of the instrument. They can be supported by the producer or purchased later. The producer activates the optional function bought with the instrument. The user should activate by himself the function purchased later.

The **vibration LEVEL METER** (**VLM**) **mode** provides the user with the functions of the functions of **VLM** meeting the ISO 8041:2005 standard. The instrument can also be used for the long-term acoustic monitoring using for this purpose the huge logger, in which the measurement results are stored.

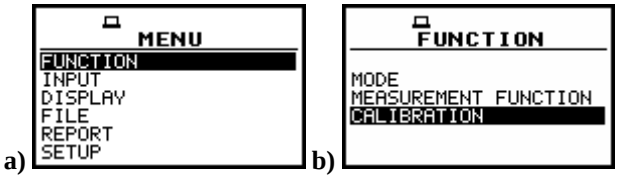
The **required function** is selected by placing the special character in the line with the **proper** text. The position of the character can be changed using the **<▲>**, **<▼>** (or **<◄>**, **<►>**) push-buttons. After placing the character in the line with the function's name the user has to press the **<ENTER>** push-button, which closes the **MEASUR. FUNCTION** sub-list.

Notice: *It is not possible to change the measurement function during the measurements. The instrument displays in this case for about 3 seconds the text:* ***"MEASUREMENT IN PROGRESS"****.* ***In order to change the mode of the instrument the measurement must be finished!***

4.3 Instrument's calibration - CALIBRATION

The instrument is factory calibrated with the supplied microphone for the standard environmental conditions. Because the microphone sensitivity is a function of the temperature, ambient pressure and humidity, when the absolute sound pressure level value is important, the calibration of the measurement channel has to be done. In order to select a calibration function the user has to enter the **CALIBRATION** sub-list (to select the **CALIBRATION** text using the **<▲>**, **<▼>** or **<◄>**, **<►>** push-buttons and press the **<ENTER>** one, when this text is displayed inversely).

The **CALIBRATION** sub-list consists of four positions: **BY SENSITIVITY**, **BY MEASUREMENT**, which are used to perform the calibration, **LAST CALIBRATION**, which contains the list of the performed in the past the calibration measurements and the obtained results and **TEDS**, which is used for automatical reading of vibration transducer parameters.



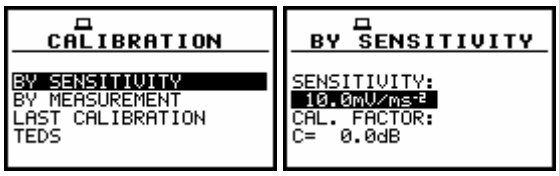
Displays with the main list; the FUNCTION text selected (a), the FUNCTION list opened, the CALIBRATION text selected (b)

Note: *The calibration level and the calibration result is expressed in different units depending on the settings of the instrument. The metric or non-metric vibration units are set in the* ***VIBRATION UNITS*** *(path: MENU / SETUP / VIBRATION UNITS). Additionally, the linear or logarithmic units are set in the* ***DISPLAY SCALE*** *(path: MENU / DISPLAY / DISPLAY SETUP / DISPLAY SCALE).*

4.3.1 Calibration BY SENSITIVITY

The calibration by the accelerometer's sensitivity introduction can be conducted in the following way:

1. **Select this type of the calibration** (highlight the **BY SENSITIVITY** text) **from the CALIBRATION sub-list and press the <ENTER> push-button.**



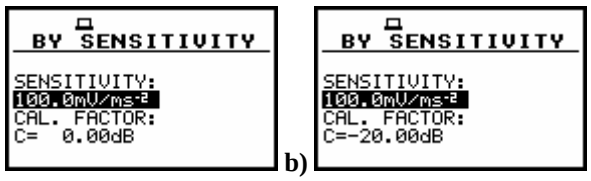
Displays with the selected calibration mode and after entering this mode

Notice: It is not possible to calibrate the instrument *during the execution of the measurements. It is possible to open different lists and sub-lists but the positions in these lists are not displayed inversely and so - not accessible.* ***The "Loudspeaker" icon*** *indicates that the instrument is* ***in the measurement process. In order to change the sensitivity the measurement must be finished!***

Displays with the SENSITIVITY positions *(path: MENU / FUNCTION / CALIBRATION / BY SENSITIVITY)* not accessible

2. **Set the sensitivity of the accelerometer taken from its calibration certificate using the <◄>, <►> push-buttons and then press the <ENTER> one.**

The calibration factor is calculated, after pressing the **<ENTER>** push-button, in the relation to 10.0 mV / ms^{-2}. In order to avoid the calculation the user has to leave the **CALIBRATION** without pressing **<ENTER>**. For the sensitivity of the accelerometer higher than 10.0 mV / ms^{-2} the calibration factor is negative.



Displays during setting the sensitivity higher than 10.0 mV / ms^{-2} (a) and after pressing the <ENTER> push-button with the calibration factor calculated (b)

For the sensitivity of the accelerometer lower than 10.0 mV / ms^{-2} the calibration factor is positive.

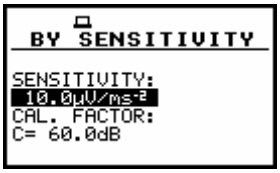
a) 

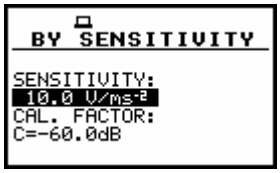
b) 

Displays during setting the sensitivity lower than 10.0 mV / ms^{-2} (a) and after pressing the <ENTER> push-button with the calibration factor calculated (b)

The lowest applicable value of the sensitivity to be introduced is equal to 10.0 μV / ms^{-2} (it conforms to the calibration factor equal to 60.0 dB) and the highest one – 10.0 V / ms^{-2} (calibration factor equal to -60.0 dB).

In order to return to the **CALIBRATION** sub-list the user has to press the **<ESC>** push-button.

a) 

b) 

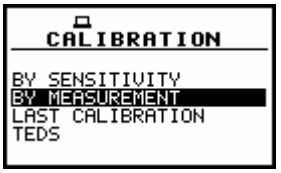
Displays with the lowest possible sensitivity and the highest calibration factor (a) and the highest sensitivity and the lowest calibration factor (b)

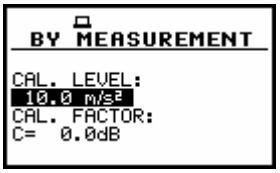
Note: *The calibration factor is always added to the results in the* ***VIBRATION LEVEL METER*** *mode (****VLM****),* ***1/1 OCTAVE****,* ***1/3 OCTAVE*** *and the* ***FFT*** *analysis modes.*

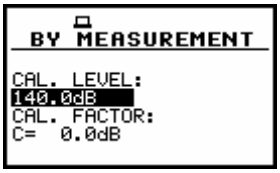
4.3.2 The calibration BY MEASUREMENT in the case of vibration signal

The calibration by measurements can be conducted in the following way:

1. **Select the calibration by measurement** (highlight the **BY MEASUREMENT** text) **from the CALIBRATION sub-list and press the <ENTER> push-button.**







Displays with the selected calibration mode and after entering this mode

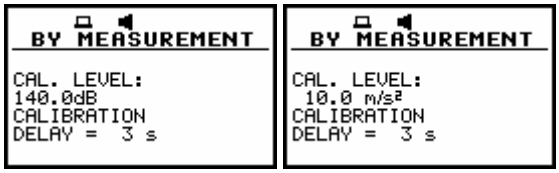
2. **Attach the vibration calibrator to the instrument's accelerometer.**

3. **Switch on the calibrator and wait approximately 30 seconds before starting the calibration measurement.**

4. **Start the calibration measurement by pressing the <START / STOP> push-button.**

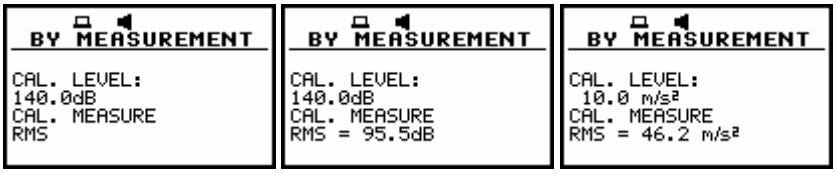
The measurement starts after 5 seconds delay. The measurement time is also predefined to 5 seconds. During the calibration period, the **<ESC>** and **<PAUSE>** push-buttons do not operate but it is

possible to stop the measurement using the **<START / STOP>** push-button. Waiting for the calibration measurement to begin, a **DELAY** is counted down.

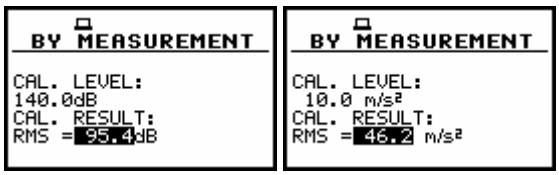


Displays while the instrument is waiting for the calibration measurement to commence

At the end of the measurement, the result is displayed on the display in the bottom line.



Displays during the calibration measurements



Displays after the calibration measurements

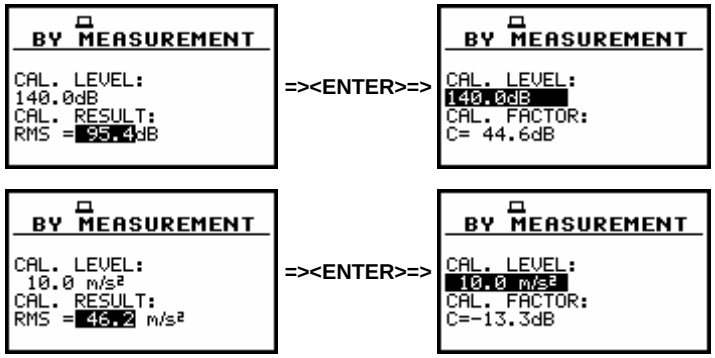
The calibration procedure should be repeated a few times to ensure the integrity of the calibration. The obtained results should be almost identical (with ±0.1 dB difference). The reasons for unstable results are as follows:

- the calibrator is not properly attached to the instrument,
- there are external disturbances,
- the calibrator or the measurement channel (the accelerometer or the instrument itself) are damaged.

Note: *During the calibration period, external disturbances (vibrations or acoustic noise) should not exceed 100 dB.*

5. Press the <ENTER> push-button in order to accept the measurement result.

The calibration factor is calculated, stored and displayed (cf. Fig. below for logarithmic and linear scale – *path: MENU / DISPLAY /DISPLAY SETUP / DISPLAY SCALE / SCALE*) after pressing the **<ENTER>** push-button.



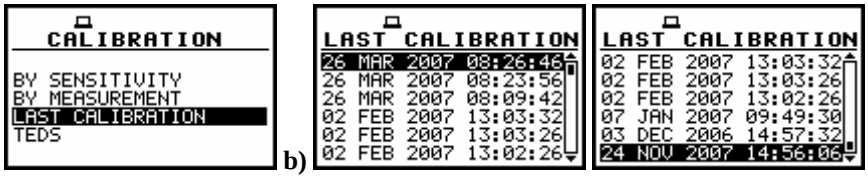
Displays after pressing the <ENTER> push-button (after calculation of the calibration factor value)

Note: *The calibration factor is always added to the measurement results in the* ***LEVEL METER*** *mode and to those coming from the frequency analysis (****1/1 OCTAVE****,* ***1/3 OCTAVE****,* ***FFT*** *and* ***ENVELOPING****).*

4.3.3 History of the calibration - LAST CALIBRATION

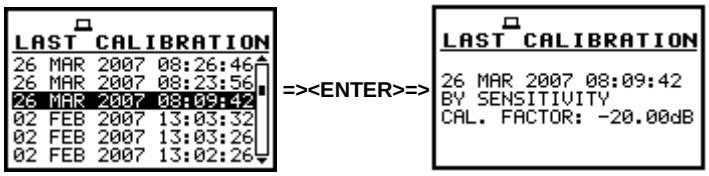
In order to enter the **LAST CALIBRATION** window in which up to last ten calibration records are remembered, the user has to select the proper text in the **CALIBRATION** window using the **<▲>**, **<▼>** push-buttons and press the **<ENTER>** one.

a) b)



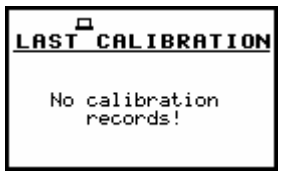
Displays in the CALIBRATION window; the LAST CALIBRATION text selected (a)
the LAST CALIBRATION window opened with ten calibration records (b)

In order to review the calibration record, the user has to select the required line in the **LAST CALIBRATION** window using the **<▲>**, **<▼>** push-buttons and press the **<ENTER>** one. The opened window contains the date and time of the performed calibration measurement, the way the calibration was done (**BY MEASUREMENT** or **BY SENSITIVITY**), the desired calibration level (**CAL. LEVEL**) in the case of the measurements and the obtained calibration factor (**CAL. FACTOR**).



Displays with the LAST CALIBRATION record

In the case when the calibration measurements were not performed, the **LAST CALIBRATION** window does not contain any record. The contents of this window is cleared after the **CLEAR SETUP** operation.



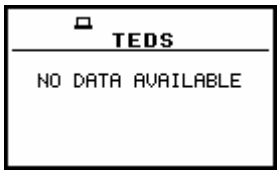
Display with the empty LAST CALIBRATION window

4.3.4 Automatic reading of a vibration transducer parameters - TEDS

The **TEDS (Transducer Electronic Data Sheet)** function enables automatic reading by the instrument the sensitivity and other electronics parameters of vibration transducer. This function will

be available soon. In order to enter the **TEDS** window the user has to select the **TEDS** text in the **CALIBRATION** list using **<▲>**, **<▼>** push-buttons and press the **<ENTER>** one.

CALIBRATION window; TEDS text highlighted



TEDS window opened; NO DATA AVAILABLE message

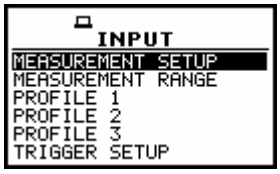
5 MEASUREMENT PARAMETERS SETTING - INPUT

The profile parameters can be set in the **INPUT** list, which can be entered after pressing the **<MENU>** push-button, then selecting by means of the **<▲>**, **<▼>** (or **<◀>**, **<▶>**) push-buttons the **INPUT** text and finally pressing the **<ENTER>** one.

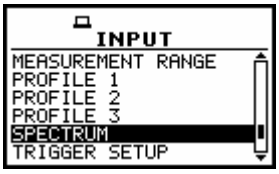
Main list with the INPUT text selected

The **INPUT** list in the **LEVEL METER** contains the elements which enable one the independent programming of the measurement parameters (**MEASUREMENT SETUP**), the input range (**MEASUREMENT RANGE**), parameters of three profiles (**PROFILE 1**, **PROFILE 2** and **PROFILE 3**) and the trigger function (**TRIGGER SETUP**). In the case of **1/1 OCTAVE** and **1/3 OCTAVE** on the display appears **SPECTRUM** position. In the case of **FFT analyser** on the display appears **FFT** position and in the case of **ENVELOPING** – the **ENVELOPING** position. After activation (with a special code) of **RPM** option in the **SETUP** list on the display appears additionally **RPM** position.

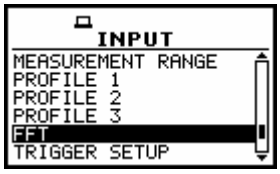
a)



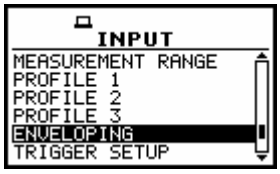
b)



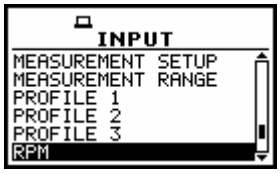
c)



d)

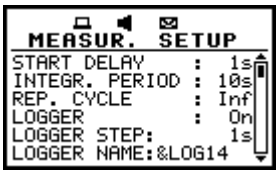


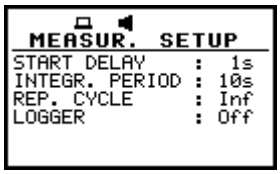
e)

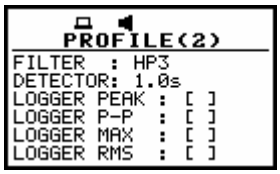


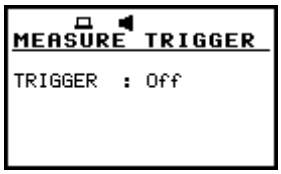
INPUT list in the LEVEL METER (a), in 1/1 OCTAVE and 1/3 OCTAVE analyser (b) in FFT analyser (c) in ENVELOPING (d) and after activation of RPM option (e)

Notice: Any parameter in the INPUT list can be changed only when the instrument does not execute a measurement. The possibility of a change is signalled by displaying inversely a parameter's field. Moreover, normally displayed field means that the parameter cannot be changed. The "Loudspeaker" icon indicates that the instrument is performing the measurements.







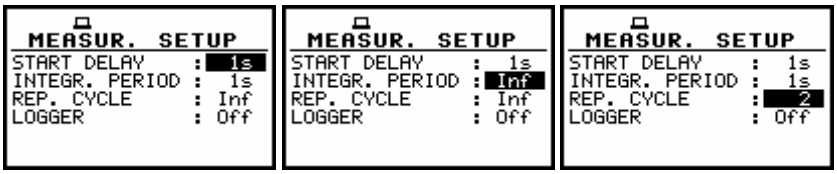


Displays with not active sub-lists of INPUT list during measurement

Notice: The parameters can be presented in LOGARITHMIC (decibels) or LINEAR (m/s^2) units. It depends on the DISPLAY SCALE position (path: MENU / DISPLAY / DISPLAY SETUP / DISPLAY SCALE/ LOG or LIN), e.g. 10 m/s^2 can be presented as 140 dB.

5.1 Selection of measurement parameters - MEASUREMENT SETUP

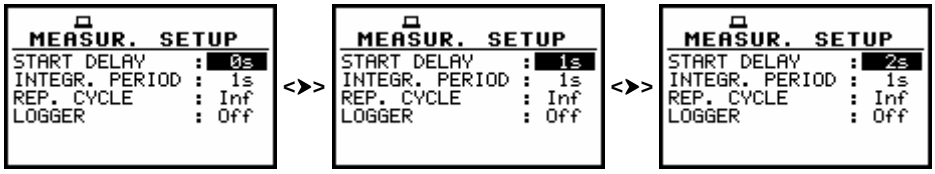
The **MEASUREMENT SETUP** is opened after the selection of the **MEASUREMENT SETUP** text from the **INPUT** list by means of the **<▲>**, **<▼>** (or **<▲>**, **<▼>** with **<SHIFT>**) push-buttons and pressing the **<ENTER>** one. The **MEASUREMENT SETUP** consists of the parameters, which can be set or switched on / off, namely: the delay of the start of measurements (**START DELAY**), the integration period (**INTEGR. PERIOD**), the repetition of the measurement cycles (**REP. CYCLE**) and the logger activation or deactivation (**LOGGER**). If the logger is active, the user can set the logging period (**LOGGER STEP**) and give a name to the logger's file (**LOGGER NAME**). In order to change the displayed inversely parameter the user has to press the **<▲>**, **<▼>** push-buttons. The confirmation of any change made in the sub-list requires pressing the **<ENTER>** push-button, which simultaneously closes the sub-list. The **MEASUREMENT SETUP** is closed ignoring any changes made in there, after pressing any time the **<ESC>** push-button.



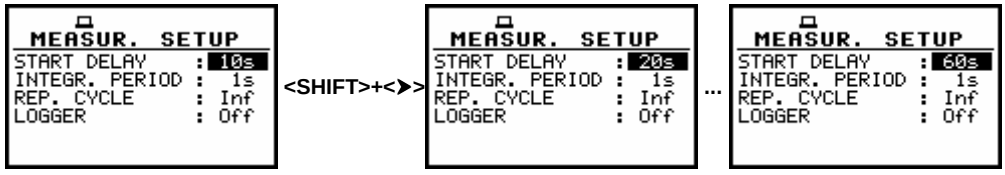
Displays with the MEASUREMENT SETUP window

5.1.1 Setting time delay before the start of measurements - START DELAY

The **START DELAY** defines the delay period from the **<START / STOP>** push-button pressing to the start of the measurements (the digital filters of the instrument analyse constantly the input signal even when the measurements are stopped). This delay period can be set from **0 second** to **60 seconds** (with 1 second step by means of the **<◄>**, **<►>** push-buttons and with 10 seconds step with the **<◄>**, **<►>** push-buttons pressed together with the **<SHIFT>** one). The **<ENTER>** push-button must be pressed for the confirmation of the selection, which closes simultaneously the **MEASUREMENT SETUP** window.



MEASUREMENT SETUP windows; the setting of the START DELAY with 1-second step



MEASUREMENT SETUP windows; the setting of the START DELAY with 10-seconds step

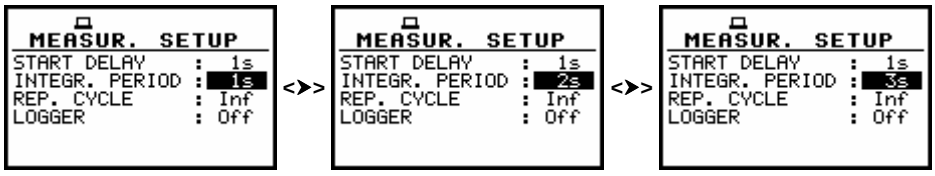
Notice: The minimum delay period is equal to 0 second. *In the* ***CALIBRATION*** *mode, the delay period is equal to 5 seconds.*

5.1.2 Setting the integration period - INTEGR. PERIOD

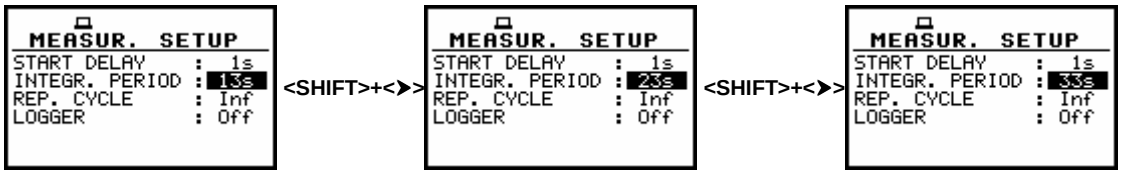
The **INTEGR. PERIOD** defines the period in which the signal is being averaged during the measurements. The definitions of the measurement results in which the integration period is used is given in App. D. The required value of this parameter can be set by means of the **<◄>**, **<►>** and confirmed by the **<ENTER>** push-button.

The integration period (**INTEGR. PERIOD**) can be set (by pressing the **<►>** (or **<►>** with **<SHIFT>**) push- button):

- From **1 s** to **59 s** (with **1 second** or **10 seconds** step).

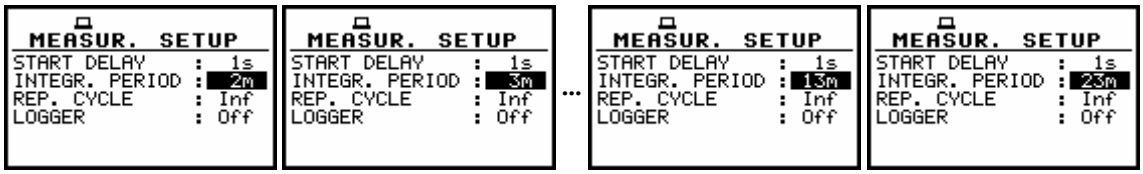


MEASUREMENT SETUP windows; the setting of the INTEGR. PERIOD with 1-second step



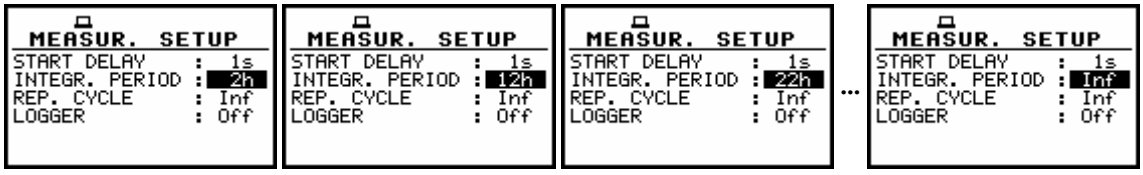
MEASUREMENT SETUP windows; the setting of the INTEGR. PERIOD with 10-seconds step

- From **1 m** (min) to **59 m** (with **1 minute** or **10 minutes** step).



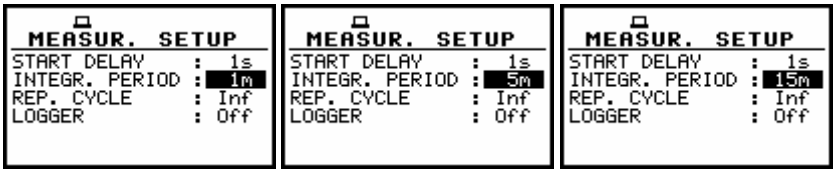
MEASUREMENT SETUP windows; the setting of the INTEGR. PERIOD with 1 and 10-minutes step

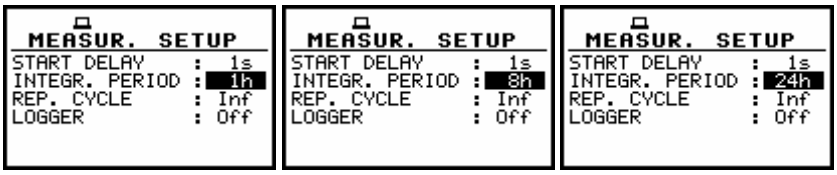
- From **1 h** to **24 h** (with **1 hour** or **10 hours** step). It is also possible to set **Inf** value.



MEASUREMENT SETUP windows; the setting of the INTEGR. PERIOD with 10-hours step

Additionally, the predefined periods: **1 m**, **5 m**, **15 m**, **1 h**, **8 h** and **24 h**, which are enumerated in the standards, are also available (by pressing the **<◄>** push-button or **<◄>** with **<SHIFT>**; these values are placed in the mentioned above sequence on the left in relation to **1 s**).

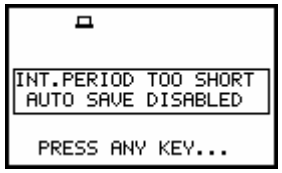




Displays during setting the predefined INTEGR. PERIOD sequence

Notice: In the case of switching on the AUTO SAVE function, the minimum value of the integration period should be equal to 10 seconds.

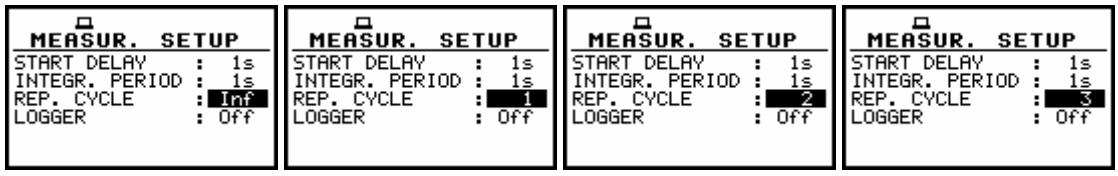
If the user wants to switch on **AUTO SAVE** option *(path: MENU / FILE / SAVE OPTIONS / AUTO SAVE)* the integration period value has to be greater or equal than 10 seconds. When **AUTO SAVE** option was switched on and new entered integration period value is less than 10 seconds **AUTO SAVE** option switches off and **INT.PERIOD TOO SHORT / AUTO SAVE DISABLED** message appears on the display.



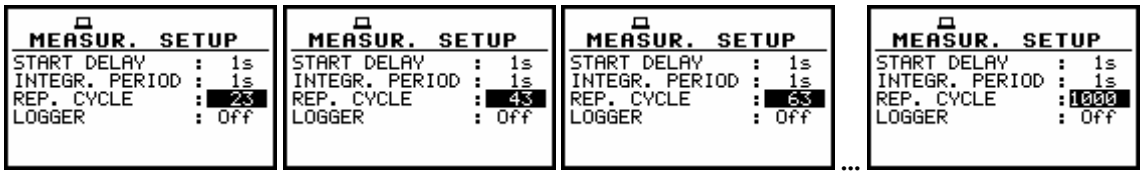
Display, when the INT.PERIOD is too short for AUTO SAVE option

5.1.3 Setting the number of repetition of measurement cycles - REP. CYCLE

The **REP. CYCLE** defines the number of cycles (with the measurement period defined in the **INTEGR. PERIOD**) which should be performed by the instrument. The required parameter can be set by means of the **<◄>**, **<►>** push-buttons (with the step equal to 1) or by means of the **<◄>**, **<►>** push-buttons pressed together with the **<SHIFT>** one (with the step equal to 20). The selected value is accepted by pressing the **<ENTER>** push-button, which closes the **MEASUREMENT SETUP** window. The **Inf** value denotes the infinite repetition of the measurements (until the pressing the **<START / STOP>** push-button or after receiving the remote control code). The **REP. CYCLE** number values are within the limits [1, 1000].



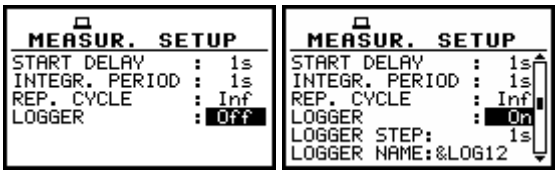
REP. CYCLE setting with the step equal to one



REP. CYCLE setting with the step equal to 20

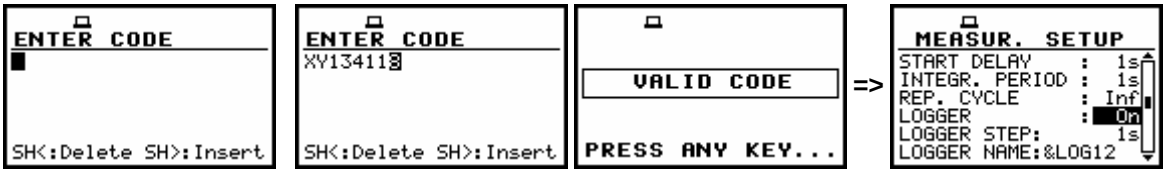
5.1.4 Logger functionality switching On / Off - LOGGER

The **LOGGER** switches on and off the functionality, which enables the user to save in a file the selected results from three profiles with the defined period. The **LOGGER** can be activated and deactivated by means of the **<◄>**, **<►>** push-buttons and accepted by the **<ENTER>** one. The acceptation closes simultaneously the **MEASUREMENT SETUP** window. Any changes are ignored after pressing the **<ESC>** push-button.



Displays with the LOGGER deactivated and activated

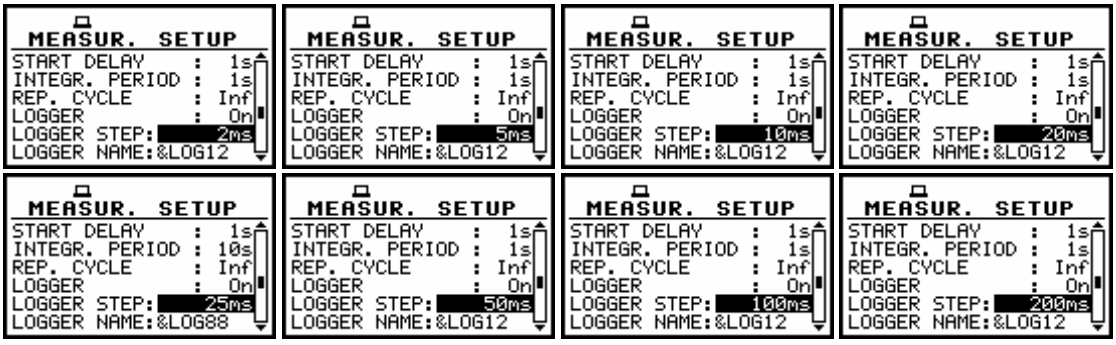
The **LOGGER** functionality is not included in the standard set of the instrument. It can be bought together with the instrument ordering the proper option or can be purchased by the user in the future. In the latter case, after selecting **On** value, the user has to introduce special code activating the functionality. After successful activation, the logger remains available and the instrument never more asks for the code.



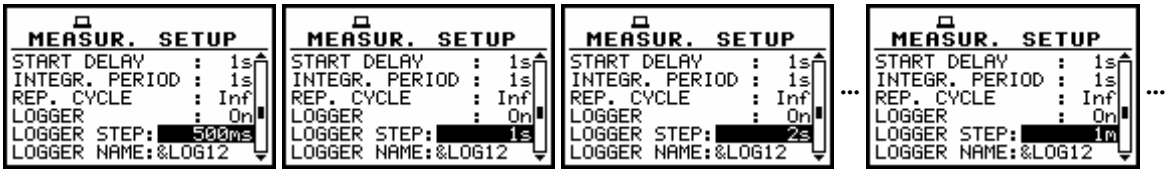
Displays during setting the LOGGER STEP; available values in a sequence 1, 2, 5

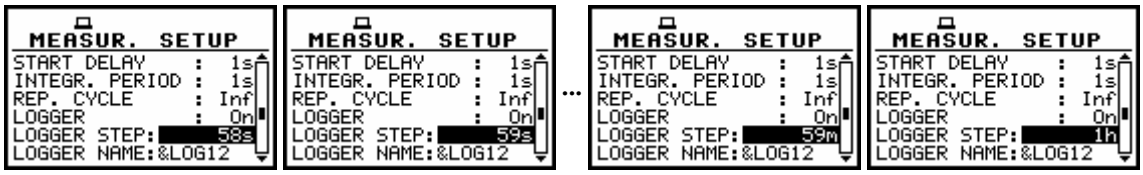
5.1.5 Setting time period between two writings to the logger's file - LOGGER STEP

The **LOGGER STEP** defines the period of the data logging in a file. It can be set from **2 ms** to **1 s** in 1, 2, 5 sequence, the values from 1 second to 59 seconds, the values from 1 minute to 59 minute and 1 hour. The required parameter can be set by means of the **<◄>**, **<►>** push-buttons with the single step and by means of the **<◄>**, **<►>** with **<SHIFT>** with the incremented one. The selection is accepted by the **<ENTER>** one, which closes simultaneously the **MEASUREMENT SETUP** window. Any changes are ignored after pressing the **<ESC>** push-button.



LOGGER STEP setting; available values in milliseconds

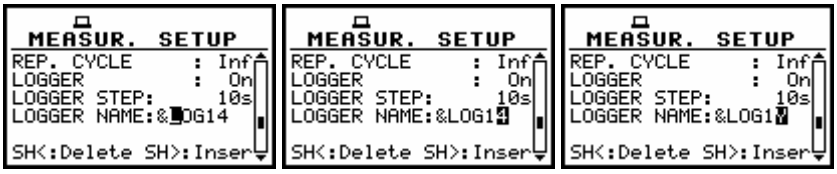




LOGGER STEP setting; available values from 500 milliseconds to 1 hour

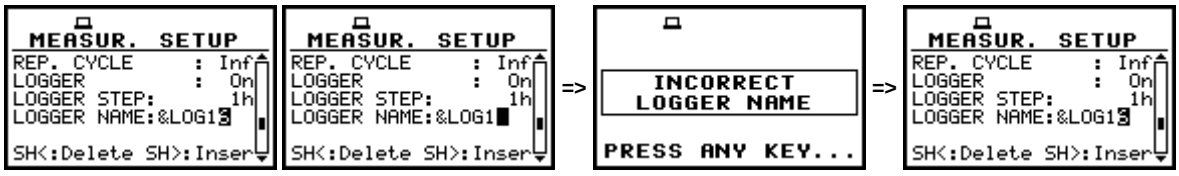
5.1.6 Logger file name edition - LOGGER NAME

The **LOGGER NAME** enables the user to name the logger file. The default one is &LOG. The name cannot be longer than eight characters including not edited first one character **&**. After entering this line, the special help is displayed in the display's last line. The name edition is performed similarly to the name edition in the **FILE NAME** line of the **SAVE** or **SAVE SETUP** window. The edition process is presented below. The displayed inversely character is currently edited. The **<◄>**, **<►>**, **<▲>**, **<▼>** and **<SHIFT>** push-buttons are used for editing the name. One can select the proper position of the character in the edited text using the **<◄>**, **<►>** push-buttons. The available ASCII characters can be changed using the **<▲>** (or **<▼>**) push-button pressed together with the **<SHIFT>** one. The subsequent digits, underline, big letters and space appear on the display in the inversely displayed position after each pressing of the mentioned above push-buttons.



LOGGER NAME edition in MEASUREMENT SETUP

The edited name is accepted and the file is saved after pressing the **<ENTER>** push-button. The special warning is displayed in the case the file with the edited name already exists in the memory. The instrument waits then for a reaction of the user (any push-button should be pressed except the **<SHIFT>** or the **<ALT>** one).

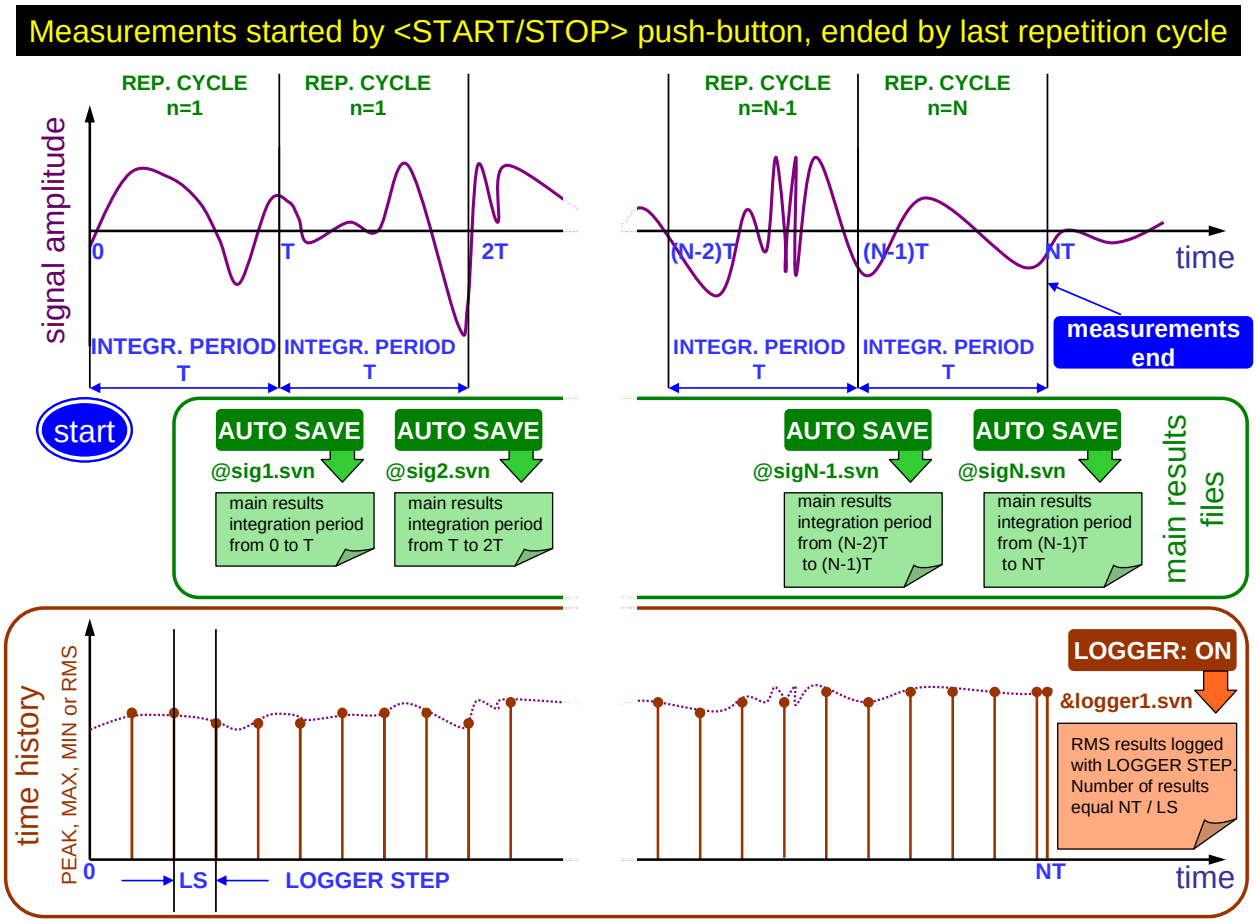


Displays during the attempt of overwriting the existing file

The main measurement results (cf. App. B) (**RMS**, **VDV, OVL**, **PEAK**, **P–P**, **MTVV (**or **MAX)**, for **LEVEL METER**, **1/1 OCTAVE**, **1/3 OCTAVE**, **FFT** and **ENVELOPING** are calculated in the period set in the **INTEGR. PERIOD**. These results can be saved in the result files of the instrument's memory by means of the **SAVE** or **SAVE NEXT** function (*path: MENU / FILE / SAVE*). In the case the **INTEGR. PERIOD** is greater than 9 seconds, it can be done also by means of the **AUTO SAVE** operation. The name of the file for that operation is set in the **FILE NAME** window (*path: MENU / FILE / AUTO SAVE / FILE NAME*). In the case the **REP. CYCLE** is greater than one, the **AUTO SAVE** operation will be performed after the period set in the **INTEGR. PERIOD**. The name of the file with the main results is changed after each saving.

In the same, when the **LOGGER** is **On**, the partial measurement results are calculated in the period set in the **LOGGER STEP**. Up to 12 results can be logged simultaneously from three independent profiles of the instrument (**PEAK**/ **P–P**/ **MAX**/ **RMS**) from each profile (*path: MENU / INPUT / PROFILE x*, *where x = 1, 2 and 3*)) with time step down to 2 ms. These results are saved in one logger's file memory of the instrument in the **LEVEL METER** as well as for other functions. The name of the file is set in the **LOGGER NAME** position. The registration in the logger's memory is stopped after the period, which is

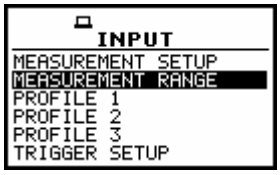
equal to **INTEGR. PERIOD** multiplied by **REP. CYCLE**, after pressing the **<START/STOP>** push-button or after stopping the measurements remotely.



Relations between INTEGR. PERIOD and LOGGER STEP

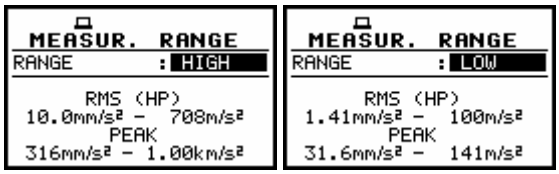
5.2 Measurement range setting - MEASUREMENT RANGE

The **MEASUREMENT RANGE** is used to set one of the available measurement ranges in the instrument. In order to open this window the user has to select the **MEASUREMENT RANGE** text in the **INPUT** list by means of the **<◄>**, **<►>**push-buttons and press the **<ENTER>** one.



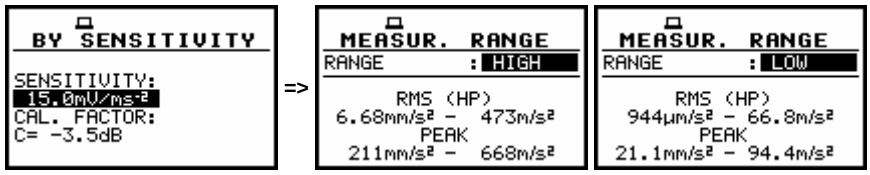
INPUT list with the MEASUREMENT RANGE selected

There are two ranges available **HIGH** and **LOW**. The detailed description of the measurement ranges parameters is given in App. C. The change of the input range is made by means of the **<◄>**, **<►>** push-buttons. After pressing the **<ENTER>** push-button the change is confirmed and the window closes. The return to the **INPUT** list ignoring any changes made in the sub-list is made after pressing the **<ESC>** push-button.



MEASUREMENT RANGE windows, the RANGE selection

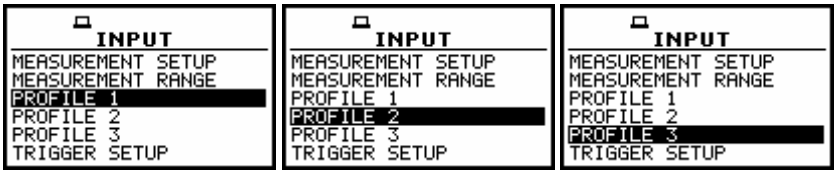
The range values change due to the calibration factor.



Displays with change of the default range values caused by the calibration factor

5.3 Setting parameters in a profile - PROFILE x

The user enters the **PROFILE x** sub-list after pressing the **<ENTER>** push-button on the displayed inversely **PROFILE x** text, which has to be selected by means of the **<◄>**, **<►>** push-buttons. In the **PROFILE x** sub-list the following parameters can be programmed independently for each profile: weighting filter (**FILTER**), RMS detector type (**DETECTOR**) and profile's results logged in a file (**LOGGER PEAK**, **LOGGER P–P**, **LOGGER MAX** and **LOGGER RMS**).



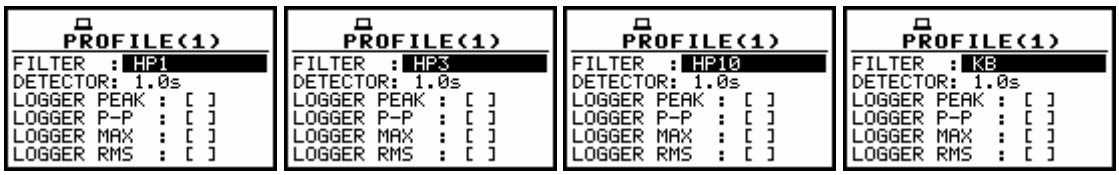
INPUT list with the PROFILE 1, PROFILE 2 and PROFILE 3 selected

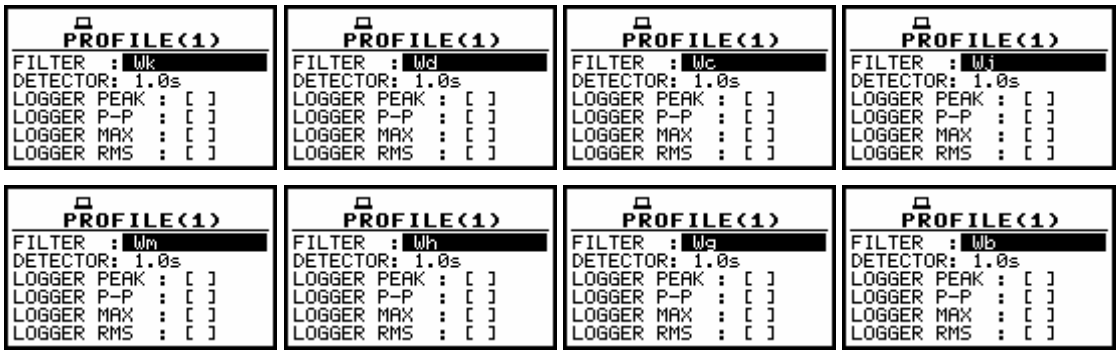
Notice: The change of the profile parameters is not possible when the measurement is performed. *The user has to finish the current measurement.*

5.3.1 Weighting filter selection in a profile - FILTER

The following weighting filters are available in a profile of the instrument:

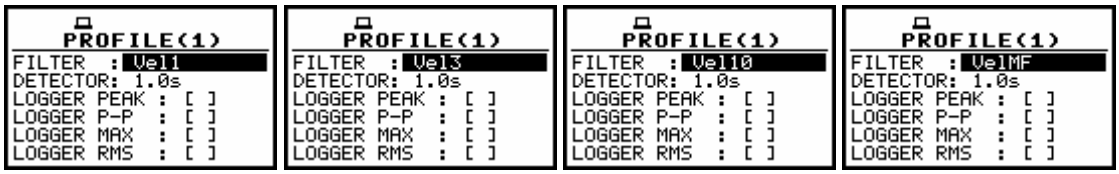
- in the case of acceleration measurements: **HP1**, **HP3**, **HP10**, **KB**, **Wk**, **Wd**, **Wc**, **Wj**, **Wm**, **Wh**, **Wg** and **Wb**





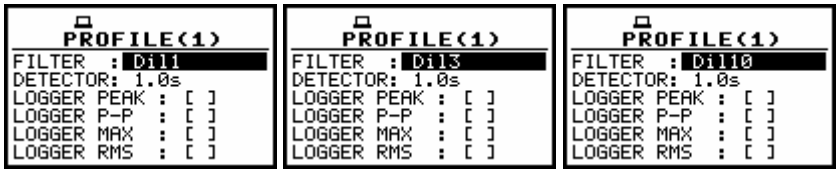
PROFILE(1) windows; the selection of the weighting filter in acceleration measurements

- in the case of velocity measurements: **Vel1**, **Vel3**, **Vel10** and **VelMF**



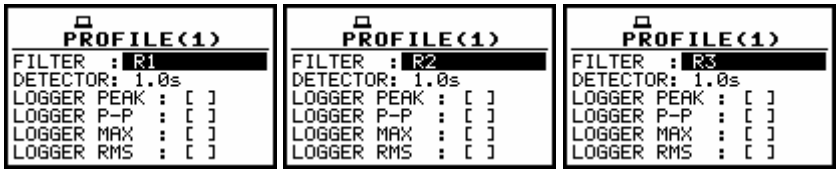
PROFILE(1) windows; the selection of the weighting filter in velocity measurements

- in the case of displacement measurements: **Dil1**, **Dil3** and **Dil10**



PROFILE(1) windows; the selection of the weighting filter in displacement measurements

- for all types of signal it is possible to use real time filters **R1**, **R2**, **R3** if they are activated in the **SETUP** list (*path: SETUP/USER FILTERS/ REAL TIME FILTERS*)



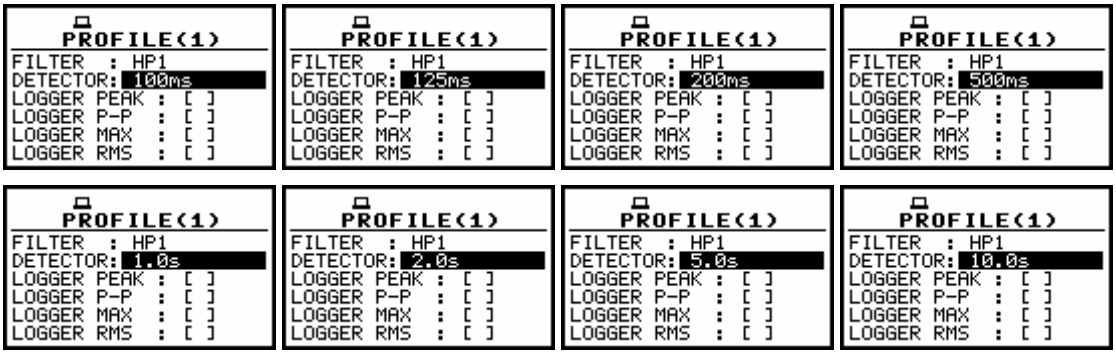
PROFILE(1) windows; the selection of the R1, R2, R3 weighting filter

The characteristics of the filters are given in App. D. The selection of the required filter is made with the **<◄>**, **<►>** push-buttons. The user can enter the **FILTER** line in the **PROFILE x** sub-list pressing the **<▲>**, **<▼>** push-buttons. After pressing the **<ENTER>** push-button any changes made in the sub-list are confirmed and it is closed. The return to the **INPUT** list ignoring any changes made in the sub-list is made after pressing the **<ESC>** push-button.

5.3.2 RMS detector selection - DETECTOR

In the instrument the following RMS detectors are available: **100ms**, **125ms**, **200ms**, **500ms**, **1.0s**, **2.0s**, **5.0s**, **10.0s**. The selection of the required detector is made with the **<◄>**, **<►>** push-buttons. The user can enter the **DETECTOR** line in the **PROFILE x** sub-list pressing the **<▲>**, **<▼>** push-buttons. After

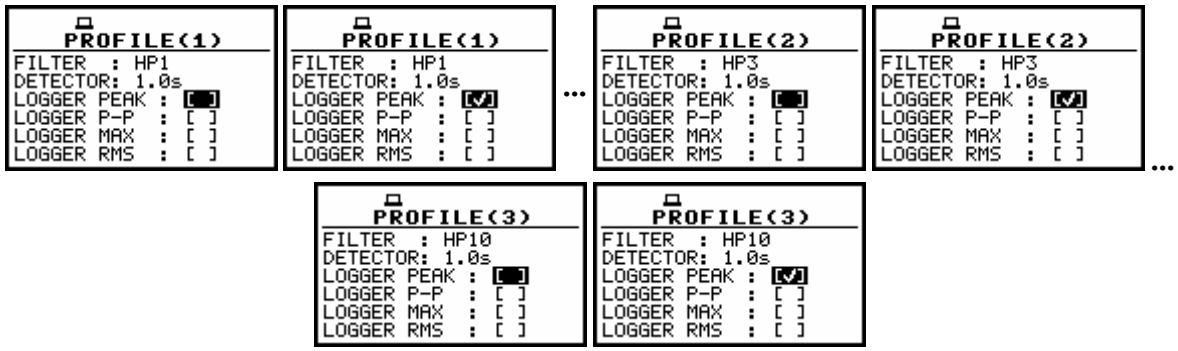
pressing the **<ENTER>** push-button any changes made in the sub-list are confirmed and it is closed. The return to the **INPUT** list ignoring any changes made in the sub-list is made after pressing the **<ESC>** push-button.



PROFILE(1) windows; the selection of the RMS detector

5.3.3 PEAK result selection for saving in a logger's file - LOGGER PEAK

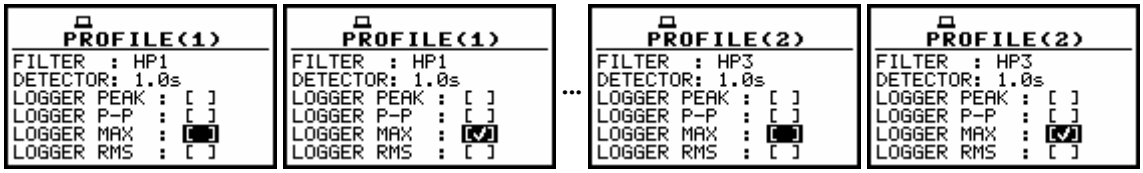
Up to four measurement results from each profile can be saved in the logger's file of the instrument. In order to save the **PEAK** result (cf. the definition in App. D) the user has to activate this line (by means of the **<▲>**, **<▼>** push-buttons) and place a special character in the brackets using the **<◀>**, **<▶>** push-buttons. After pressing the **<ENTER>** push-button any changes made in the window are confirmed and it is closed. The return to the **INPUT** list ignoring any changes made in the window is made after pressing the **<ESC>** push-button.

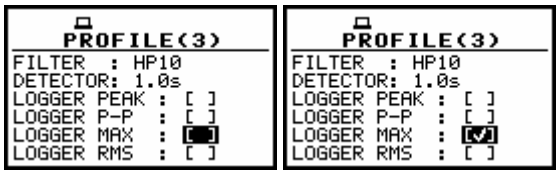


PROFILE(x) windows; the PEAK result to be not saved or saved in a logger's file

5.3.4 MAX result selection for saving in a logger's file - LOGGER MAX

In order to save the **MAX** result (cf. the definition in App. D) the user has to activate this line (by means of the **<▲>**, **<▼>** push-buttons) and place a special character in the brackets using the **<◀>**, **<▶>** push-buttons. After pressing the **<ENTER>** push-button any changes made in the window are confirmed and it is closed. The return to the **INPUT** list ignoring any changes made in the window is made after pressing the **<ESC>** push-button.

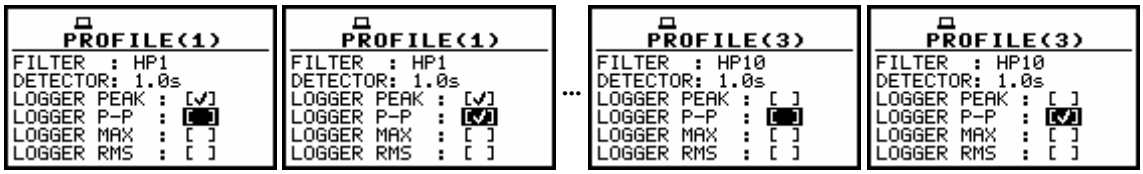




PROFILE(x) windows ; the MAX result to be not saved or saved in a logger's file

5.3.5 P–P result selection for saving in a logger's file - LOGGER P-P

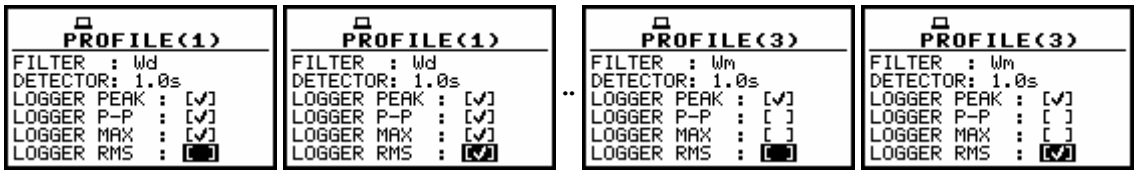
In order to save the **P–P** result (cf. the definition in App. D) the user has to activate this line (by means of the **<▲>**, **<▼>** push-buttons) and place a special character in the brackets using the **<◄>**, **<►>** push-buttons. After pressing the **<ENTER>** push-button any changes made in the window are confirmed and it is closed. The return to the **INPUT** list ignoring any changes made in the window is made after pressing the **<ESC>** push-button.



PROFILE(x) windows; the P-P result to be not saved or saved in a logger's file

5.3.6 RMS result selection for saving in a logger's file - LOGGER RMS

In order to save the **RMS** result (cf. the definition in App. D) the user has to activate this line (by means of the **<▲>**, **<▼>** push-buttons) and place a special character in the brackets using the **<◄>**, **<►>** push-buttons. After pressing the **<ENTER>** push-button any changes made in the window are confirmed and it is closed. The return to the **INPUT** list ignoring any changes made in the window is made after pressing the **<ESC>** push-button.



PROFILE(x) windows; the RMS result to be not saved or saved in a logger's file

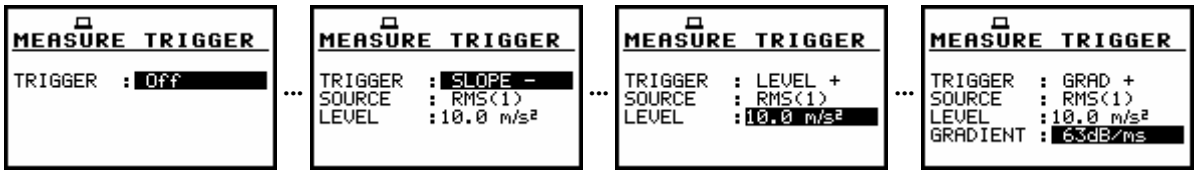
5.4 Triggering mode and parameters selection - TRIGGER SETUP

The **TRIGGER SETUP** sub-list enables the user to set the triggering parameters. It is not present for the **DOSE METER** function. This sub-list is opened after the selection of the **TRIGGER SETUP** text from the **INPUT** list by means of the **<▼>**, **<►>** (or **<▼>**, **<►>** with **<SHIFT>**) push-buttons and pressing the **<ENTER>** one. The **TRIGGER SETUP** consists of the **MEASURE TRIGGER**, **LOGGER TRIGGER** and **RECORDER TRIGGER** sub-lists. The return to the **INPUT** list is made after pressing the **<ESC>** push-button.

TRIGGER SETUP selected in the INPUT list and the TRIGGER SETUP window

5.4.1 Trigger parameters setting - MEASURE TRIGGER

The **MEASURE TRIGGER** is a contexts sub-list in which the triggering can be switched off or on (**TRIGGER**), in the case when on - the source of the triggering signal can be determined (**SOURCE**), its level (**LEVEL**) and sometimes also the speed of changes (**GRADIENT**). In order to enter this sub-list the user has to select by means of the **<▲>**, **<◄>** push-buttons the **MEASURE TRIGGER** text in the **TRIGGER SETUP** sub-list and press the **<ENTER>** one.

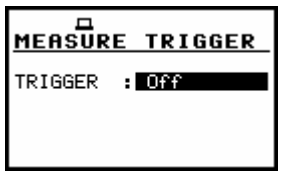


MEASURE TRIGGER windows

In order to change the displayed inversely parameter the user has to press the **<▲>**, **<▼>** push-buttons. The confirmation of any change made in the window requires pressing the **<ENTER>** push-button, which simultaneously closes the current display. The **MEASURE TRIGGER** window is closed ignoring any changes made, after pressing any time the **<ESC>** push-button.

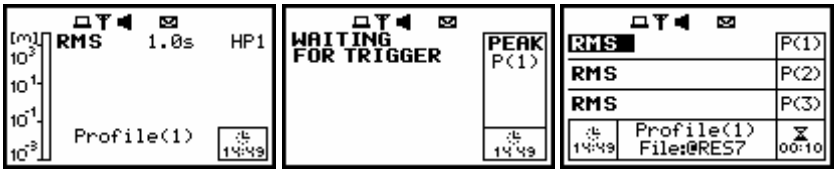
5.4.1.1 Switching the triggering on and off - TRIGGER

The triggering of the measurements (**TRIGGER**) can be switched off using the **<◄>** push-button.



MEASURE TRIGGER window; TRIGGER switched off

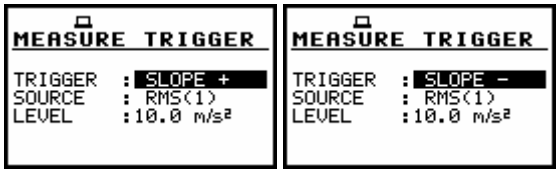
The triggering is switched on if one of its five modes is selected: **SLOPE +**, **SLOPE –**, **LEVEL +**, **LEVEL –** or **GRAD +**. The selection of the triggering mode is performed using the **<◄>**, **<►>** push-buttons. If the instrument works with the triggering switched on, the **"Antenna"** icon is flashing on the display in the case when the triggering condition was not fulfilled.



Displays during the measurements while the triggering condition is not fulfilled

In the case when the **SLOPE +** is selected, the measurement starts when the arising signal will pass the level determined in the **LEVEL**. In the case when the **SLOPE –** is selected, the measurement starts when the falling down signal will pass the level determined in the **LEVEL**. The measurement

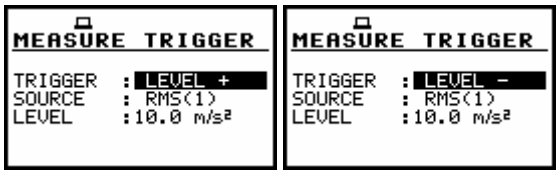
is stopped when the conditions set in the **MEASUREMENT SETUP** sub-list are fulfilled, after pressing the **<START / STOP>** push-button or after receiving the proper control code remotely.



MEASURE TRIGGER windows with the SLOPE modes selected

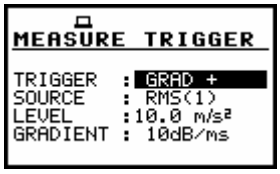
In the case when the **LEVEL +** is selected, in each second of the measurement the triggering condition is checked; the measurement is registered only when the signal has the greater level than this determined in the **LEVEL** and in the other case the measurement result is skipped.

In the case when the **LEVEL –** is selected, in each second of the measurement the triggering condition is checked; the measurement is registered only when the signal has the lower level than this determined in the **LEVEL** and in the other case the measurement result is skipped.



MEASURE TRIGGER windows with the LEVEL modes selected

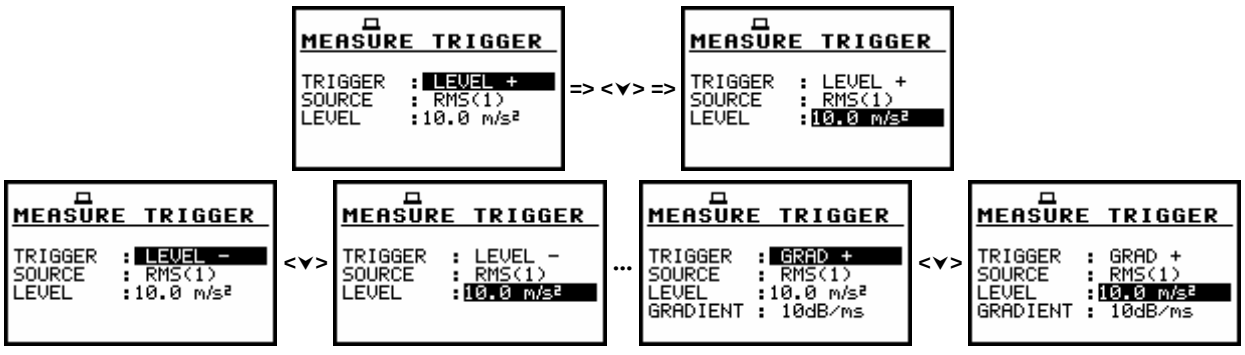
In the case when the **GRAD +** is selected, in each second of the measurement the triggering condition is checked; the measurement is registered only when the signal has the greater level than this determined in the **LEVEL** and the speed of the signal changes is not less than that selected in the **GRADIENT**. In the other case the measurement result is skipped.



MEASURE TRIGGER window with the GRAD + mode selected

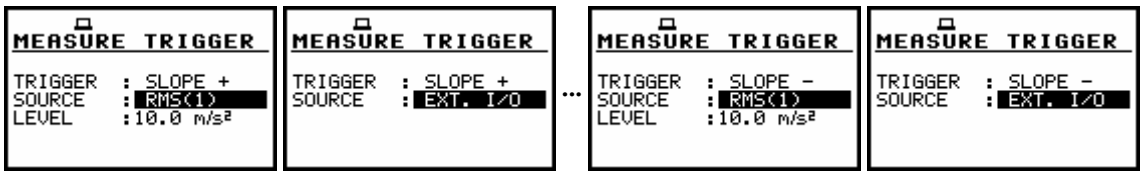
5.4.1.2 Selection of the triggering signal - SOURCE

It is assumed that only one measured result can be used as a source of the triggering signal in the **LEVEL METER** mode, namely the output signal from the RMS detector coming from the first profile which is denoted here as **RMS(1)**. This position does not become active (it is not displayed inversely) and the text stated here remains unchanged in the case of **LEVEL +**, **LEVEL –** or **GRAD +** triggering mode. After pressing there the **<▼>** push-button, the **SOURCE** line is skipped.



MEASURE TRIGGER windows with not active SOURCE signal line

In the case of **SLOPE +** and **SLOPE –** as a source of the triggering signal can be used the signal connected to the external input/output socked named **I/O**. The selection of the source of the triggering signal is performed using the **<◄>**, **<►>** push-buttons.

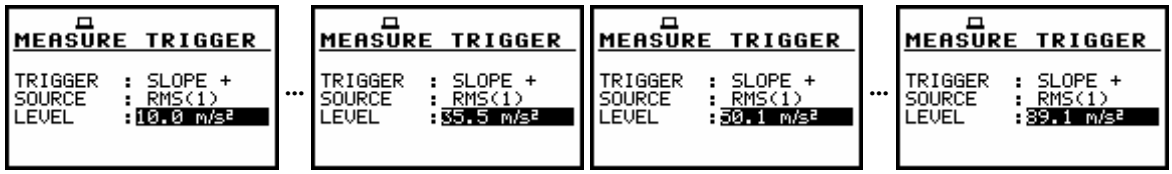


MEASURE TRIGGER windows with the SOURCE signal selection

Notice: *Only one signal measured in the instrument - the RMS detector in the first profile - can be used as the triggering signal. Additionally, the signal from* ***Ext.I/O*** *can be also used as the trigger source in the* ***SLOPE +*** *and* ***SLOPE –*** *modes.*

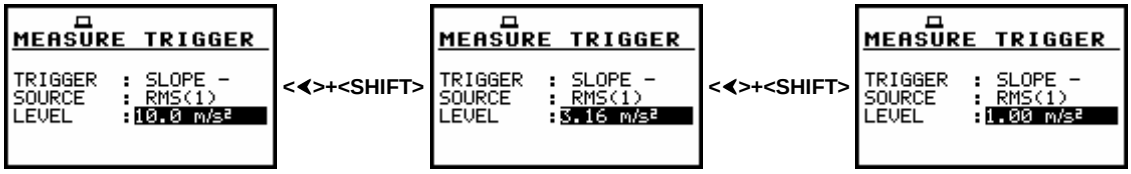
5.4.1.3 Setting the level of the triggering signal - LEVEL

The level of the triggering signal (**LEVEL**) can be set in 1 dB step (or 10 dB steps) from 1 mm/s^2 to 10.0 km/s^2 (60 dB to 140 dB) range using the **<◄>**, **<►>** push-buttons (or **<◄>**, **<►>** with **<SHIFT>**).

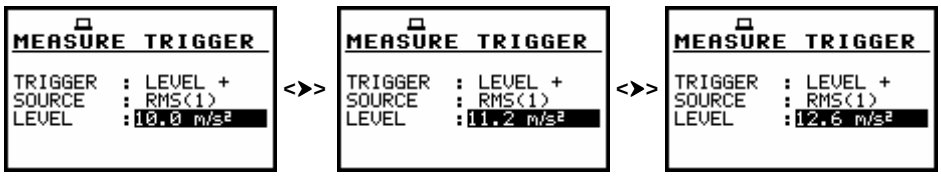


MEASURE TRIGGER windows with the LEVEL selection in the SLOPE + mode

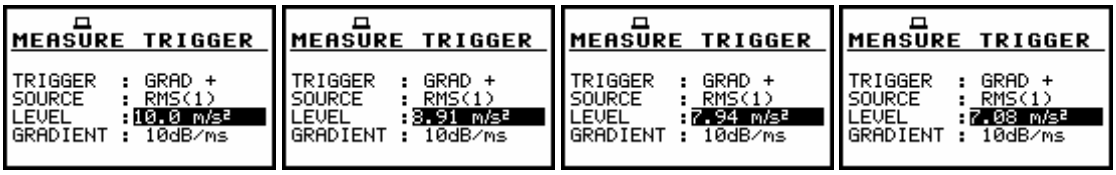
Notice: *The* ***LEVEL*** *value of the triggering signal refers to the instantaneous value of the RMS result from the first profile calculated during the period depending on selected* ***DETECTOR*** *(path: MENU / INPUT / PROFILE 1 / DETECTOR).*



MEASURE TRIGGER windows with the LEVEL selection in the SLOPE – mode (10 dB step down)



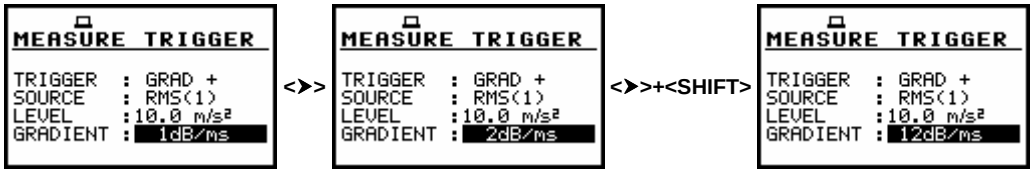
MEASURE TRIGGER windows with the LEVEL selection in the LEVEL + mode (1 dB step up)



MEASURE TRIGGER windows with the LEVEL selection in the GRAD + mode (1 dB step down)

5.4.1.4 Setting the speed of the triggering signal changes - GRADIENT

The speed of the triggering signal changes (**GRADIENT**) can be set in 1 dB/millisecond step (or 10 dB/millisecond steps) from 1 dB/ms to 100 dB/ms range using the **<◄>**, **<►>** push-buttons (or **<◄>**, **<►>** with **<SHIFT>**).



MEASURE TRIGGER windows with the GRADIENT selection (1 dB/ms and 10 dB/ms step up)

5.4.2 Trigger parameters in logger setting - LOGGER TRIGGER

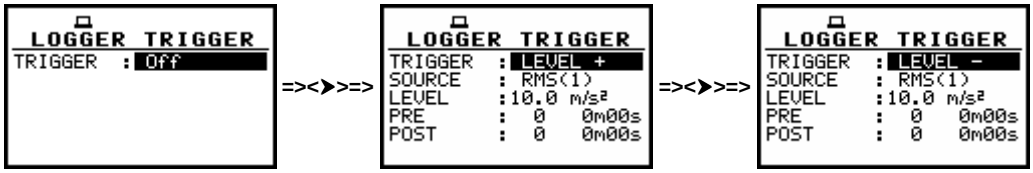
The **LOGGER TRIGGER** parameters influence the way the measurement results are saved in the logger. It is a contexts sub-list in which the triggering in logger can be switched off or on (**TRIGGER**), in the case when on (**LEVEL +**) - the source of the triggering signal is determined (**SOURCE**), its level can be selected (**LEVEL**), the number of the results saved in the logger before the fulfilment of the triggering condition (**PRE**) and the number of the results saved in the logger after the fulfilment of the triggering condition (**POST**). If the triggering signal is greater than the selected in the **LEVEL**, the logger contains:

- the measurement results registered directly before the fulfilment of the triggering condition; time of the registration can be calculated by multiplying the value set in the **PRE** by the time period taken from the **LOGGER STEP** (*path: MENU / INPUT / MEASUREMENT SETUP / LOGGER STEP*);
- all measurement results up to the moment the triggering signal falls down the **LEVEL**;
- the results registered directly after the fulfilment of the triggering condition; time of the registration can be calculated by multiplying the value set in the **POST** by the time period taken from the **LOGGER STEP** (*path: MENU / INPUT / MEASUREMENT SETUP / LOGGER STEP*).

In order to change the displayed inversely parameter the user has to press the **<▲>**, **<▼>** push-buttons. The confirmation of any change made in the window requires pressing the **<ENTER>** push-button, which simultaneously closes the current display. The **LOGGER TRIGGER** window is closed ignoring any changes made, after pressing any time the **<ESC>** push-button.

5.4.2.1 Switching the logger triggering on and off - TRIGGER

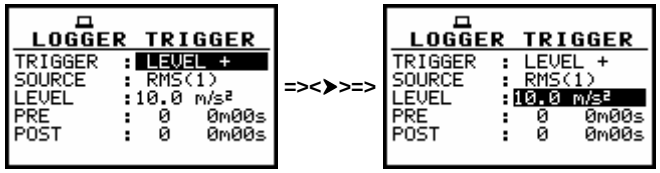
The logger triggering of the measurements (**TRIGGER**) can be switched off using the **<◄>** push-button (or **<◄>** with **<SHIFT>**). The triggering is switched on if the **LEVEL +** or **LEVEL –** mode is selected using the **<►>** push-button (or **<►>** with **<SHIFT>**).



LOGGER SETUP windows, trigger mode selection

5.4.2.2 Selection of the triggering signal in logger - SOURCE

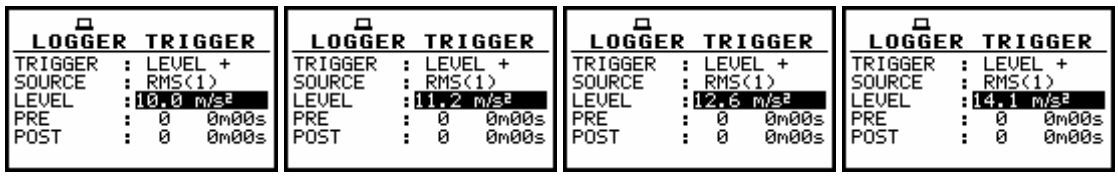
It is assumed that only one measured result can be used as a source of the triggering signal in the logger, namely the output signal from the RMS detector coming from the first profile which is denoted here as **RMS(1)**. This position does not become active (it is not displayed inversely) and the text stated here remains unchanged. After pressing the **<▼>** push-button, the **SOURCE** line is skipped.



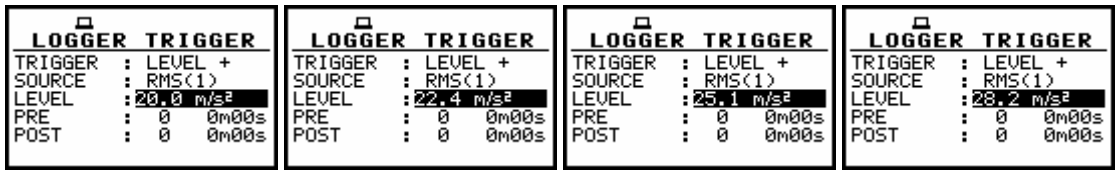
LOGGER TRIGGER windows with the not active SOURCE signal line

5.4.2.3 Setting the level of the triggering signal in the logger - LEVEL

The level of the triggering signal in logger (**LEVEL**) can be set in 1 dB step (or 10 dB steps) from 1.00 mm/s^2 to 10.0 km/ s^2 (24 dB to 136 dB) range using the **<◄>**, **<➤>** push-buttons (or **<◄>**, **<➤>** with **<SHIFT>**).

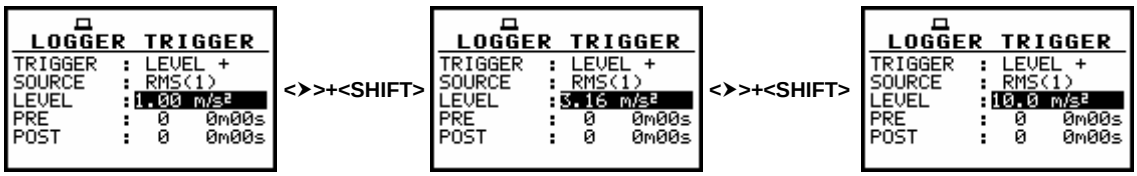


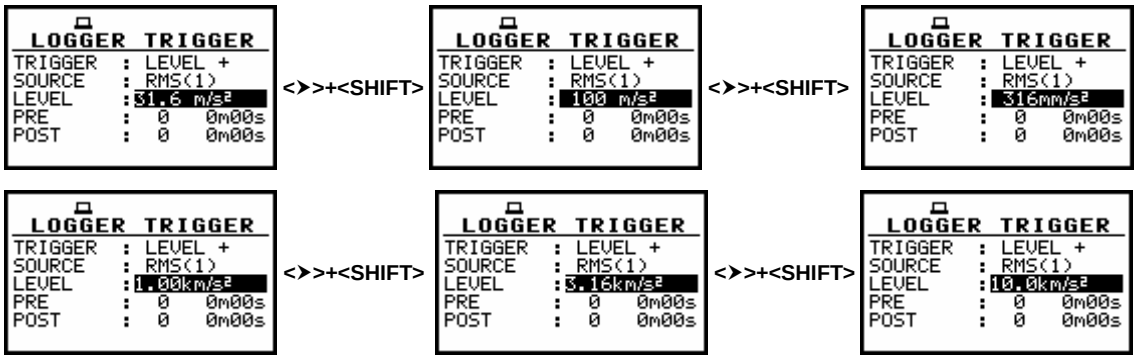
LOGGER TRIGGER windows with the LEVEL selection (1 dB step up)



LOGGER TRIGGER windows with the LEVEL selection (1 dB step up, cont.)

Notice: *The **LEVEL** value of the triggering signal in logger refers to the instantaneous value of the RMS result from the first profile calculated during the period depending on selected **DETECTOR** (path: MENU / INPUT / PROFILE 1 / DETECTOR).*

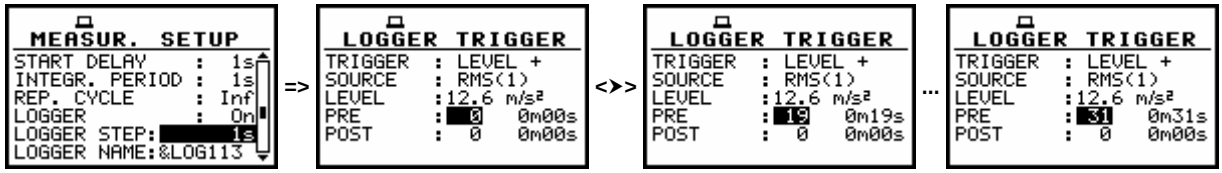




LOGGER TRIGGER windows with the LEVEL selection (10 dB step up)

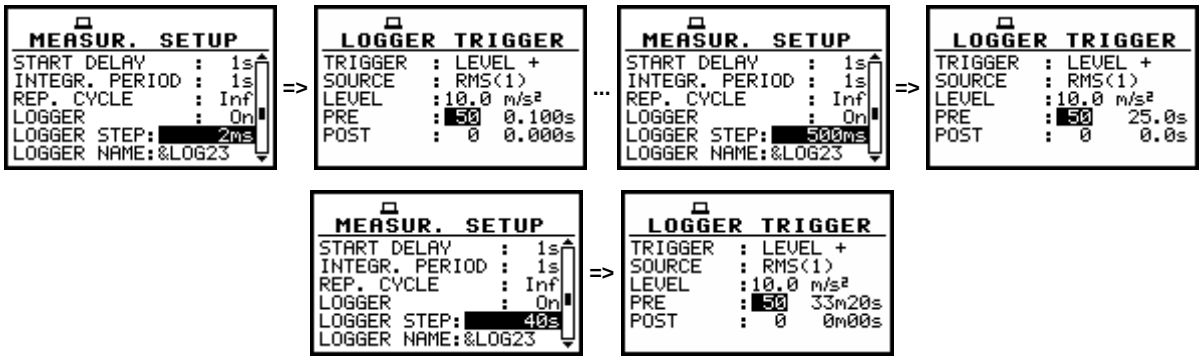
5.4.2.4 Selection of the number of the results to be saved in the logger before the fulfilment of the triggering condition - PRE

In the **PRE** line the number of the results registered in the logger's file before the fulfilment of the triggering condition can be set. This number is within the limits 0..50 and can be set with the step equal to one using the **<➤>**, **<➤>** push-buttons or with the step equal to 10 using the **<➤>**, **<➤>** with **<SHIFT>**.



LOGGER TRIGGER windows with the PRE selection

Time period of the measurements which are saved in the logger before the fulfilment of the triggering condition can be calculated multiplying the value set in the **PRE** by the value set in the **LOGGER STEP** (*path: MENU / INPUT / MEASUREMENT SETUP*). The result of the calculation is presented in the same line, at the right side of the display.

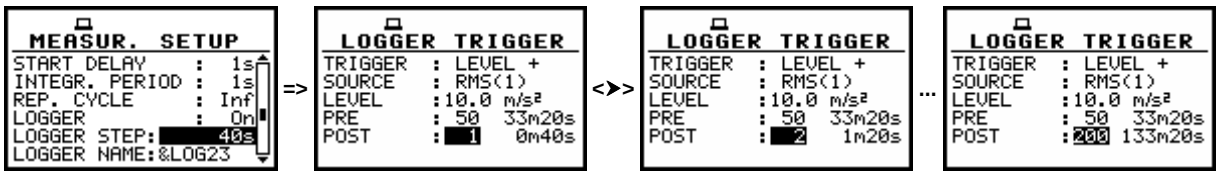


LOGGER TRIGGER windows with the PRE selection for different LOGGER STEPS

The value set in the **PRE** is confirmed and the window is closed after pressing the **<ENTER>** push-button. After pressing the **<ESC>** push-button the window is closed ignoring the settings made in the **PRE**.

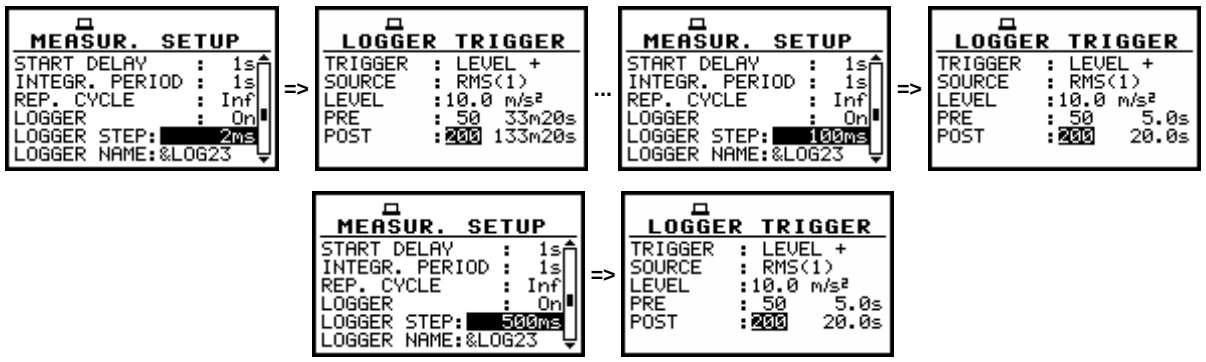
5.4.2.5 Selection of the number of the results to be saved in the logger after the fulfilment of the triggering condition - POST

In the **POST** line the number of the results registered in the logger's file after the fulfilment of the triggering condition can be set. This number is within the limits 0..200 and can be set with the step equal to one using the **<◄>**, **<►>** push-buttons or the step equal to 10 using the **<◄>**, **<►>** with **<SHIFT>**.

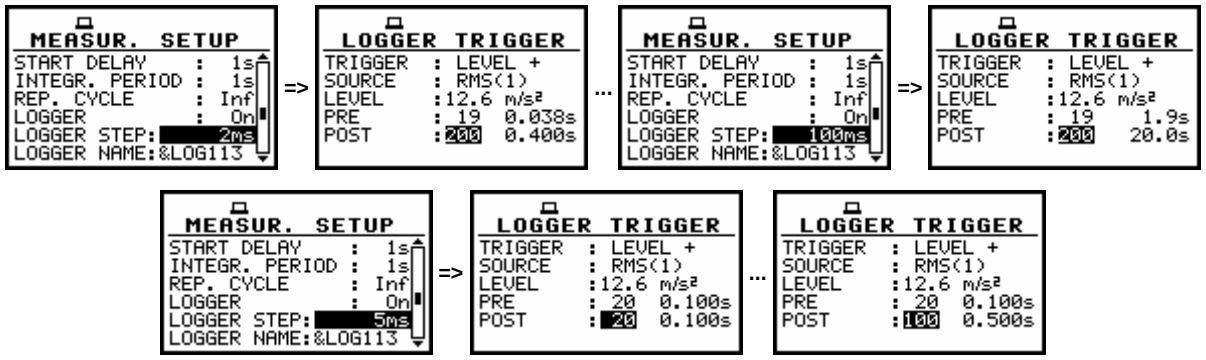


LOGGER TRIGGER windows with the POST selection

Time period of the measurements which are saved in the logger after the fulfilment of the triggering condition can be calculated multiplying the value set in the **POST** by the value set in the **LOGGER STEP** (*path: MENU / INPUT / MEASUREMENT SETUP*). The result of the calculation is presented in the same line, at the right side of the display.



LOGGER TRIGGER windows with the POST selection for different LOGGER STEPS



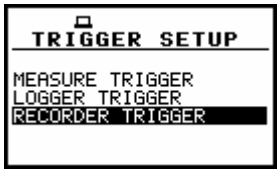
LOGGER TRIGGER windows with the POST selection for different LOGGER STEPS

The value set in the **POST** is confirmed and the window is closed after pressing the **<ENTER>** push-button. After pressing the **<ESC>** push-button the window is closed ignoring the settings made in the **POST**.

5.4.3 Trigger parameters for recorder setting - RECORDER TRIGGER

The **RECORDER TRIGGER** enables the user to set the parameters of time domain signal recording on the external USB memory stick (*path: MENU / SETUP / USB-HOST PORT / SRT RECORDING or WAVE RECORDING or EVENT RECORDING*). In order to enter

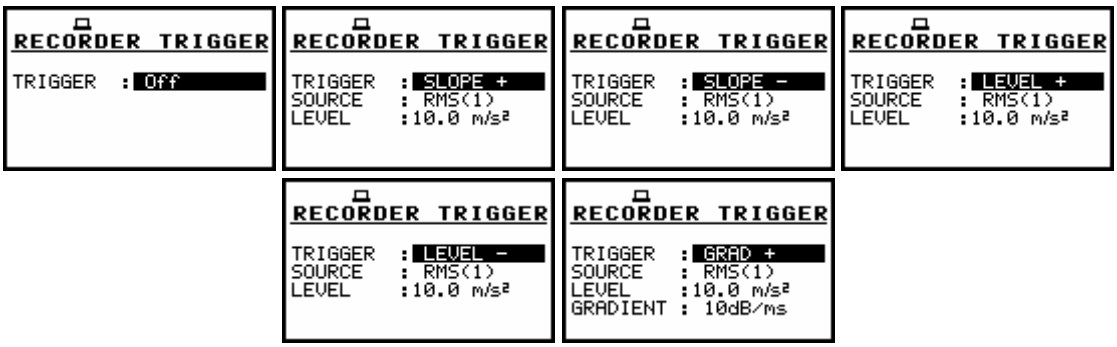
RECORDER TRIGGER window the user has to select the **RECORDER TRIGGER** text in the **TRIGGER SETUP** window using the **<◄>**, **<►>** push-buttons and press **<ENTER>**.



TRIGGER SETUP window; the RECORDER TRIGGER text highlighted

5.4.3.1 Selecting trigger mode - TRIGGER

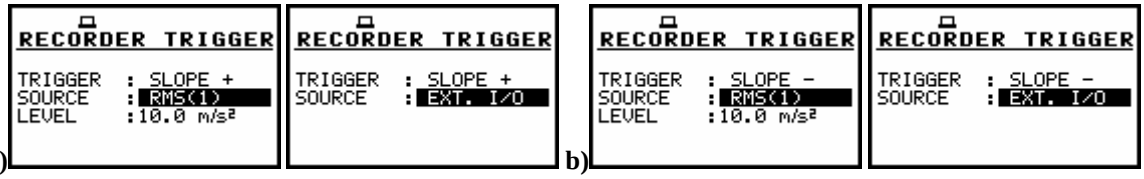
In the **TRIGGER** position following options are available: **Off**, **SLOPE +**, **SLOPE –**, **LEVEL +**, **LEVEL –**, **GRAD +**. The selection is made by pressing **<◄>**, **<►>** push-buttons and **<ENTER>** one. The **RECORDER TRIGGER** window is closed ignoring any changes made in there, after pressing any time the **<ESC>** push-button.



RECORDER TRIGGER windows; the TRIGGER selection

5.4.3.2 Selecting the triggering signal - SOURCE

In the case when in the **TRIGGER** position **SLOPE +** or **SLOPE –** is selected it is possible to choose the **SOURCE**. Available sources are **RMS(1)** and **EXT.I/O**. The selection is made using **<◄>**, **<►>** push-buttons and pressing **<ENTER>** one. The **RECORDER TRIGGER** window is closed ignoring any changes made in there, after pressing any time the **<ESC>** push-button.

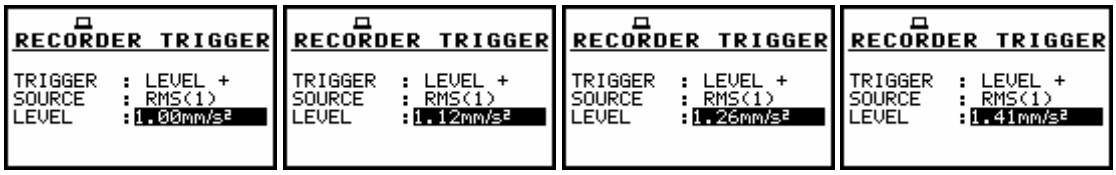


RECORDER TRIGGER windows; the source selection for SLOPE + (a) and SLOPE – (b)

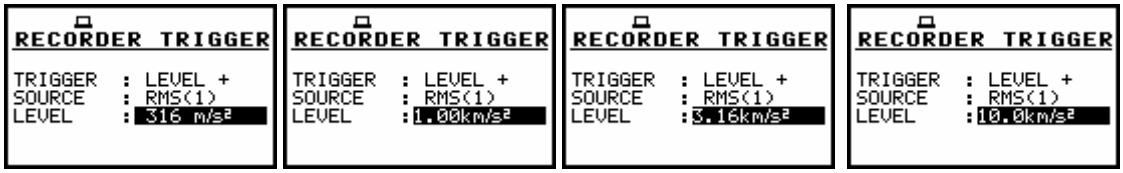
5.4.3.3 Selecting level for recording trigger- LEVEL

The level of the triggering signal for recording (**LEVEL**) can be set in 1 dB step (or 10 dB steps) from 1 mm/s^2 to 10 km/s^2 (60 dB to 140 dB) range using the **<◄>**, **<►>** push-buttons (or **<◄>**, **<►>** with **<SHIFT>**). The level can be expressed not only in in linear units (*path: MENU* / *DISPLAY* / *DISPLAY SETUP* / *SCALE* / *LIN*) but also in decibels (placing in the path *LOG* instead of *LIN*).

a)



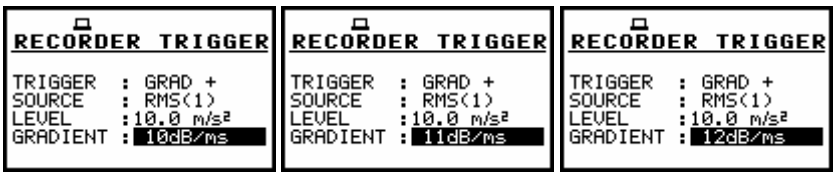
b)



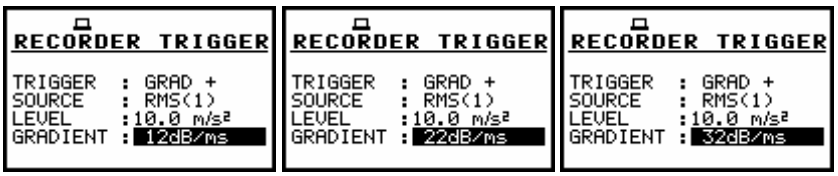
RECORDER TRIGGER windows with the LEVEL selection, level expressed in linear units, 1 dB step up (a) and 10 dB step up (b)

5.4.3.4 Setting the speed of the triggering signal changes - GRADIENT

GRADIENT appears on the display when in the **TRIGGER** position the **GRAD +** option is selected. In the **GRADIENT** position it is possible to select the **GRADIENT** value. The available values are from **1 dB/ms** to **100 dB/ms**. The selection is made by pressing **<◄>**, **<►>** push-buttons and **<ENTER>** one. The **RECORDER TRIGGER** window is closed ignoring any changes made in there, after pressing any time the **<ESC>** push-button.



RECORDER TRIGGER windows with the GRADIENT selection (1 dB step up)

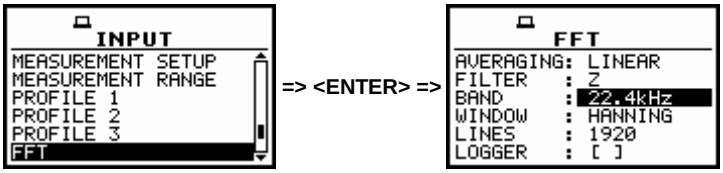


RECORDER TRIGGER windows with the GRADIENT selection (10 dB step up)

5.5 Selection of FFT analysis parameters - FFT

The **FFT** is accessible in the **INPUT** list when the **FFT** function is selected in **MEASUREMENT FUNCTION** window (*path: MENU / FUNCTION / MEASUREMENT FUNCTION / FFT*). This sub-list is opened after the selection of the **FFT** text from the **INPUT** list by means of the **<▲>**, **<▼>** (or **<◄>**, **<►>**) push-buttons and pressing the **<ENTER>** one.

The **FFT** consists of the parameters, which influence the calculation and logging the results of the **FFT** analysis: **AVERAGING**, **FILTER**, **BAND**, **WINDOW**, **LINES** and **LOGGER**. The **FFT** window is closed ignoring any changes made in there, after pressing any time the **<ESC>** push-button.



FFT selected in the INPUT list and the FFT window opened

5.5.1 The averaging of spectra in the FFT analysis - AVERAGING

The **AVERAGING** influences the way in which the spectra in the **FFT** analysis are averaged. Up to the internal software version named as 6.04 only **LINEAR** is available (this position can not be accessed and changed).

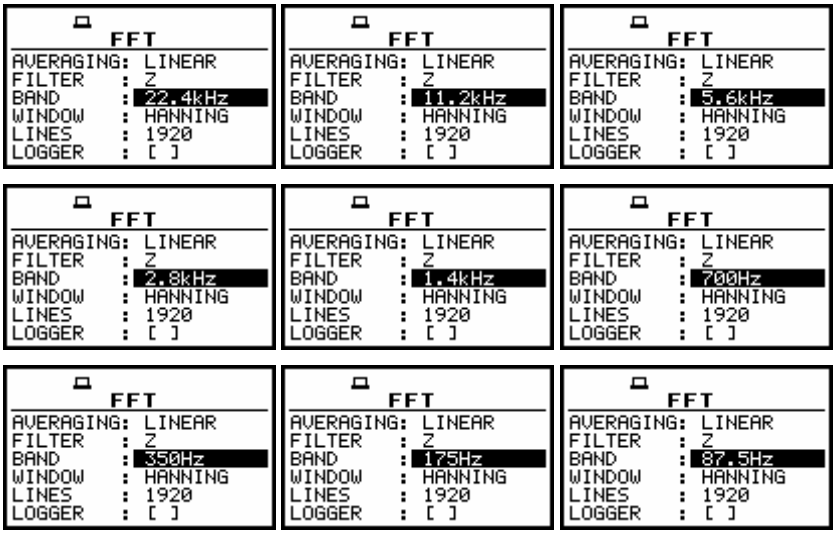
5.5.2 Weighting filter during the FFT analysis - FILTER

During the **FFT** analysis only **Z** filter (type 1 according to the IEC 61672-1 standard) is available.

5.5.3 Selecting the analysis band of the signal - BAND

The **BAND** position enables the user to select the band in which the narrow-band analysis of the signal has to be performed. The user has the following possibilities: **22.4 kHz**, **11.2 kHz**, **5.6 kHz**, **2.8 kHz**, **1.4 kHz**, **700 Hz**, **350 Hz**, **175 Hz** and **87.5 Hz**.

The selection of the required value is made by means of the **<◄>**, **<►>** push-buttons. The confirmation of the change made in the line requires pressing the **<ENTER>** push-button, which simultaneously closes the window. The **FFT** window is closed ignoring any changes made in there, after pressing any time the **<ESC>** push-button.

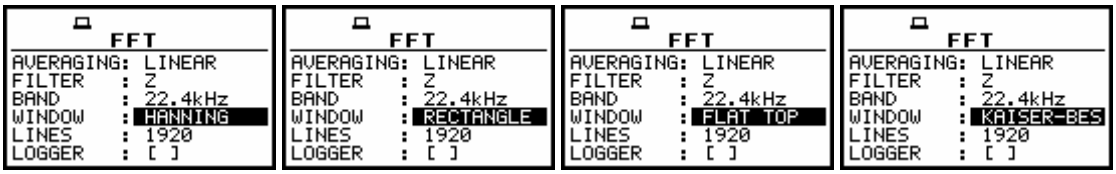


FFT window; the BAND selection

5.5.4 Selecting the time window for the FFT analysis - WINDOW

The **WINDOW** position enables the user to select the coefficients of time window which are used in the **FFT** analysis. Available time windows of the **FFT** analysis are as follows: **HANNING**, **RECTANGLE**, **FLAT TOP**, **KAISER-BESSEL**.

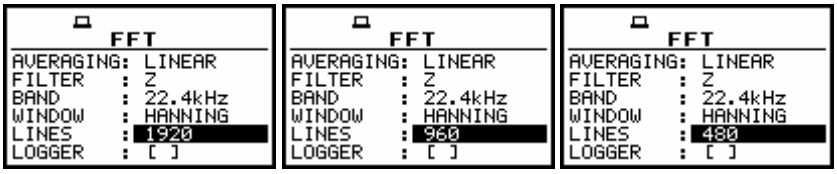
The selection of the window is made by means of the **<◄>**, **<►>** push-buttons. The confirmation of the change made in the line requires pressing the **<ENTER>** push-button, which simultaneously closes the window. The **FFT** window is closed ignoring any changes made in there, after pressing any time the **<ESC>** push-button.



FFT sublist; the WINDOW selection

5.5.5 Selecting the number of the lines of FFT analysis - LINES

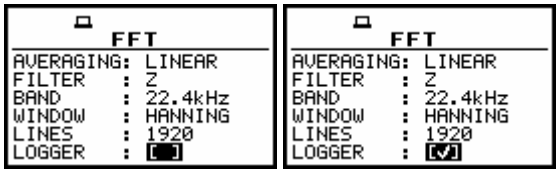
The **LINES** position enables the user to select the number of lines of the **FFT** analysis. There are three values available: **1920**, **960** and **480**. The selection of the value is made by means of the **<⮜>**, **<⮞>** push-buttons. The confirmation of the change made in the position requires pressing the **<ENTER>** push-button, which simultaneously closes the window. The **FFT** window is closed ignoring any changes made in there, after pressing any time the **<ESC>** push-button.



FFT window; the LINES selection

5.5.6 Enabling the FFT spectra time history logging - LOGGER

The **LOGGER** enables to record spectra of the **FFT** analysis in the logger file. The activation of the logger is possible only if **LOGGER** functionality has been activated in the **MEASUREMENT SETUP** sublist (*path: MENU / INPUT / MEASUREMENT SETUP / LOGGER ON)*. In order to switch on the logger of the **FFT** analysis the user has to press the **<⮞>** push-button and the **<ENTER>** one. If, instead of the **<ENTER>** push-button the **<ESC>** one is pushed, the selection is ignored and the **FFT** sub-list is closed.



FFT window; the LOGGER activation

5.6 Selection of 1/1 octave and 1/3 octave spectrum parameters - SPECTRUM

The **SPECTRUM** appears in the **INPUT** list when the **1/1 OCTAVE** or **1/3 OCTAVE** function is selected in the **MEASUREMENT FUNCTION** (*path: MENU / FUNCTION / MEASUREMENT FUNCTION / 1/1 OCTAVE or 1/3 OCTAVE*). This sub-list is opened after the selection of the **SPECTRUM** text from the **INPUT** list by means of the **<⮝>**, **<⮟>** (or **<⮜>**, **<⮞>**) push-buttons and pressing the **<ENTER>** one.

The **SPECTRUM** consists of the parameters, which influence the calculation and logging the results of **1/1 OCTAVE** or **1/3 OCTAVE** analysis: **FILTER**, **BAND** and **LOGGER.** The **SPECTRUM** window is closed ignoring any changes made in there, after pressing any time the **<ESC>** push-button.

SPECTRUM selected in the INPUT list and the SPECTRUM window opened

5.6.1 Selecting the weighting filter during 1/1 OCTAVE or 1/3 OCTAVE analysis - FILTER

During **1/1 OCTAVE** or **1/3 OCTAVE** analysis only **Z** filter (type 1 according to the IEC 61672-1 standard) is available.

5.6.2 Selecting the band during the 1/1 OCTAVE or 1/3 OCTAVE analysis - BAND

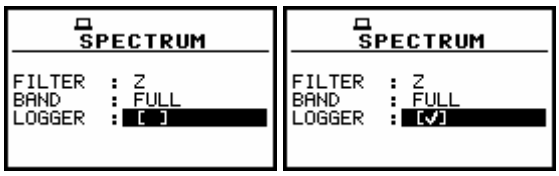
The **BAND** position enables the user to select the band in which the **1/1 OCTAVE** or **1/3 OCTAVE** analysis of the signal has to be performed. In 956 instrument only **FULL** band is available. The selection of this parameter is made by means of the **<◄>**, **<►>** push-buttons. The confirmation of the change made in the line requires pressing the **<ENTER>** push-button, which simultaneously closes the window. The **SPECTRUM** window is closed ignoring any changes made in there, after pressing any time the **<ESC>** push-button.

5.6.3 Activation of logger for 1/1 OCTAVE or 1/3 OCTAVE analysis results - LOGGER

The **RMS** result from **1/1 OCTAVE** or **1/3 OCTAVE** analysis can be saved in the logger's file of the instrument (or on the USB memory stick).

The activation is made by placing a special character in the **LOGGER** position. The activation is possible when the **LOGGER** functionality is switched on in the **MEASUREMENT SETUP** window *(path: MENU / INPUT / MEASUREMENT SETUP / LOGGER)*.

If the **LOGGER** functionality is switched off, the position is not accessible. The confirmation of the change made in the position requires pressing the **<ENTER>** push-button, which simultaneously closes the window. The **SPECTRUM** window is closed ignoring any changes made in there, after pressing any time the **<ESC>** push-button.

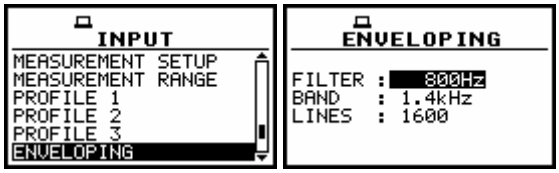


SPECTRUM window; the LOGGER selection

5.7 Selection of enveloping parameters - ENVELOPING

The **ENVELOPING** appears in the **INPUT** list when the **ENVELOPING** function is selected (*path: MENU / FUNCTION / MEASUREMENT FUNCTION / ENVELOPING*). This sub-list is opened after the selection of the **ENVELOPING** text from the **INPUT** list by means of the **<▲>**, **<▼>** (or **<◄>**, **<►>**) push-buttons and pressing the **<ENTER>** one.

The **ENVELOPING** consists of the parameters, which influence the calculation and saving the results of the **ENVELOPING**: **FILTER**, **BAND** and **LINES**. The **ENVELOPING** window is closed ignoring any changes made in there, after pressing any time the **<ESC>** push-button.



ENVELOPING selected in the INPUT list and the ENVELOPING window opened

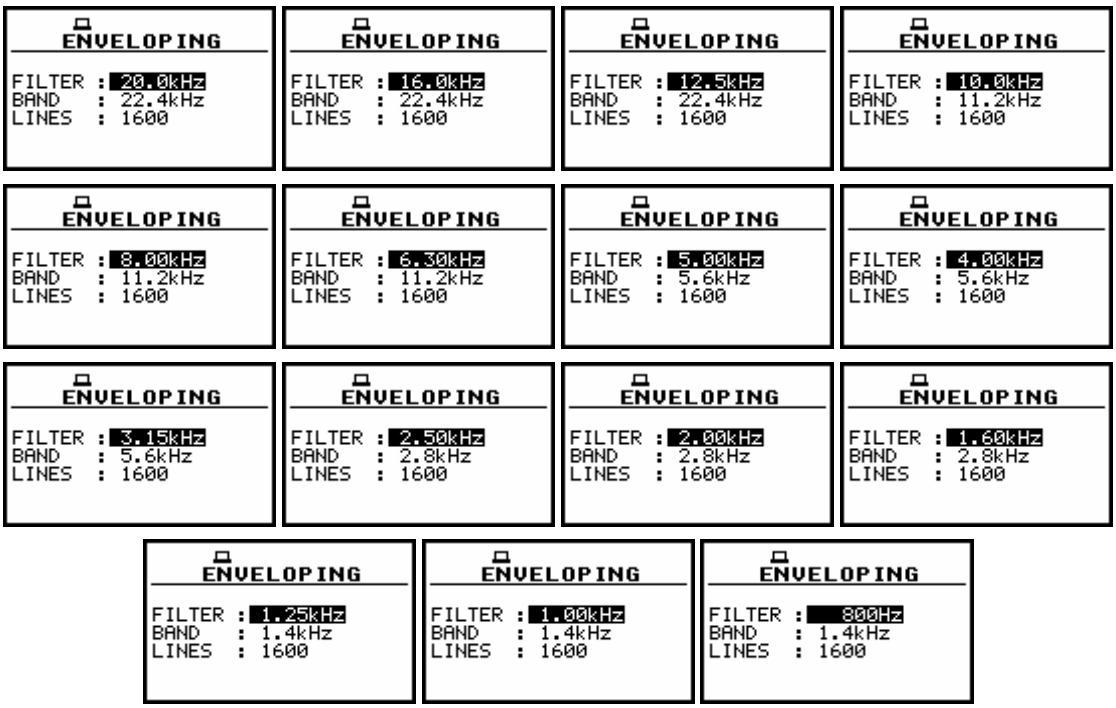
5.7.1 Selecting the weighting filter during the enveloping calculation - FILTER

The **FILTER** influences the calculations of **ENVELOPING** function. The selection of this parameter is made by means of the **<◄>**, **<►>** push-buttons.

The proper **BAND** value changes (decreases) automatically when selected band width is too wide for the selected centre frequency value.

The confirmation of the change made in the line requires pressing the **<ENTER>** push-button, which simultaneously closes the window.

The following weighting filters are available in case of enveloping function: **20.0kHz**, **16.0kHz, 12.5Hz**, **10.0kHz**, **8.00kHz**, **6.30kHz**, **5.00kHz**, **4.00Hz**, **3.15Hz**, **2.50kHz**, **2.00kHz**, **1.60kHz**, **1.25kHz**, **1600Hz**, **800Hz**.



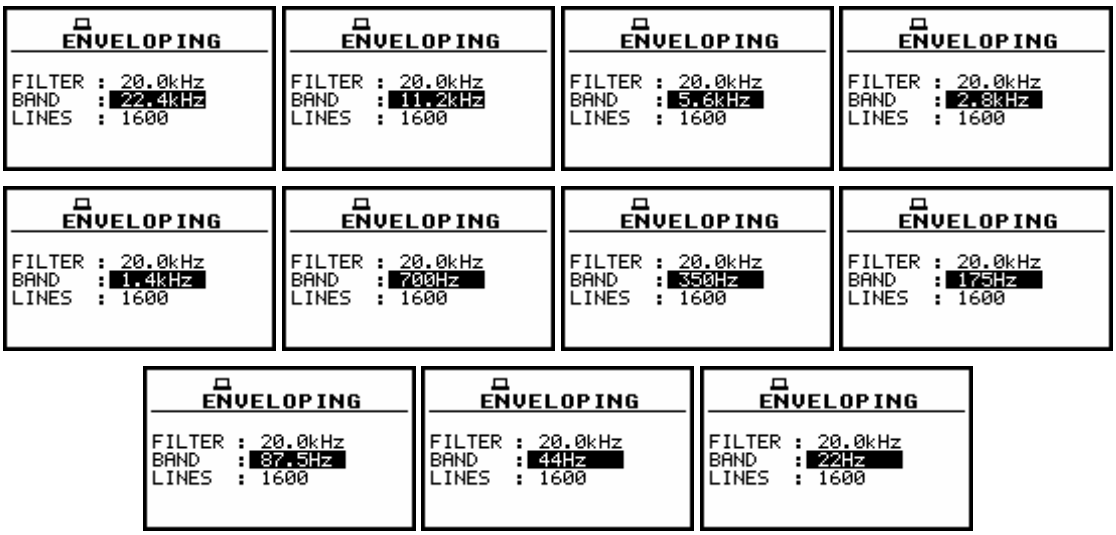
ENVELOPING window; the FILTER selection

5.7.2 Selecting the band during the enveloping analysis - BAND

The **BAND position enables** the user to select the band in which the **ENVELOPING** of the signal has to be calculated.

Available values of the bands of the **ENVELOPING** are as follows: **22.4kHz**, **11.2kHz**, **5.6kHz**, **2.8kHz**, **1.4kHz**, **700Hz**, **350Hz**, **175Hz**, **87.5Hz**, **44Hz**, **22Hz**. This parameter changes (decreases) automatically due to the centre frequency value selected in the **FILTER** position.

The selection of this parameter is made by means of the **<◄>**, **<►>** push-buttons. The confirmation of the change made in the line requires pressing the **<ENTER>** push-button, which simultaneously closes the window. The **FFT** window is closed ignoring any changes made in there, after pressing any time the **<ESC>** push-button.

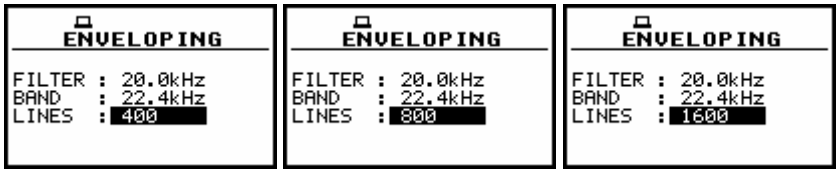


ENVELOPING window; the BAND selection

5.7.3 Selecting the number of the lines in enveloping spectrum - LINES

The **LINES** position enables the user to select the number of lines in the spectrum of enveloping. There are three values available: **400**, **800** and **1600**.

The selection of the value is made by means of the **<◄>**, **<►>** push-buttons. The confirmation of the change made in the position requires pressing the **<ENTER>** push-button, which simultaneously closes the window. The **ENVELOPING** window is closed ignoring any changes made in there, after pressing any time the **<ESC>** push-button.

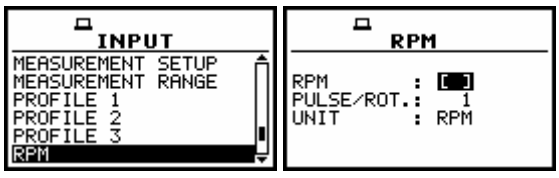


ENVELOPING window; the LINES selection

5.8 Selection of RPM measurements parameters - RPM

The **RPM** (**R**evolutions **P**er **M**inute) position appears in the **INPUT** list when the **RPM** function was activated with a special code in the **SETUP** list (*path: MENU / SETUP / RPM*).

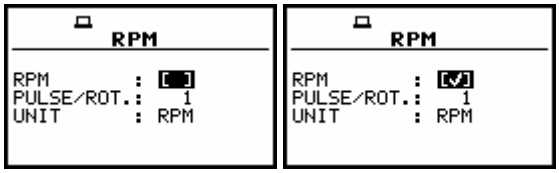
This sub-list is opened after the selection of the **RPM** text from the **INPUT** list by means of the **<▲>**, **<▼>** (or **<◄>**, **<►>**) push-buttons and pressing the **<ENTER>** one. The **RPM** consists of three positions: **RPM**, **PULSE/ROTATION** and **UNIT**. The **RPM** window is closed ignoring any changes made in there, after pressing any time the **<ESC>** push-button.



RPM selected in the INPUT list and the RPM window opened

5.8.1 Switching on the RPM measurement - RPM

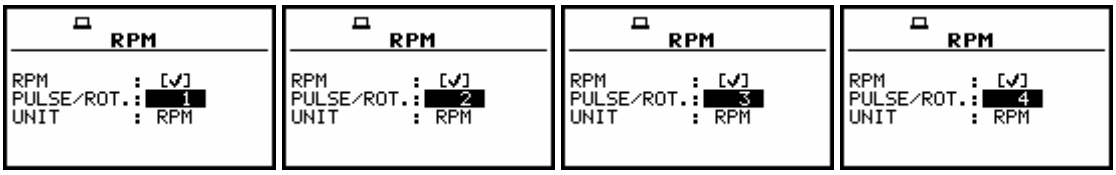
The placing a special character **[√]** in the line with **RPM** text enables the **RPM** function. The selection is made by means of the **<◄>**, **<►>** push-buttons. The confirmation of the activation requires pressing the **<ENTER>** push-button, which simultaneously closes the window. The **ENVELOPING** window is closed ignoring any changes made in there, after pressing any time the **<ESC>** push-button.



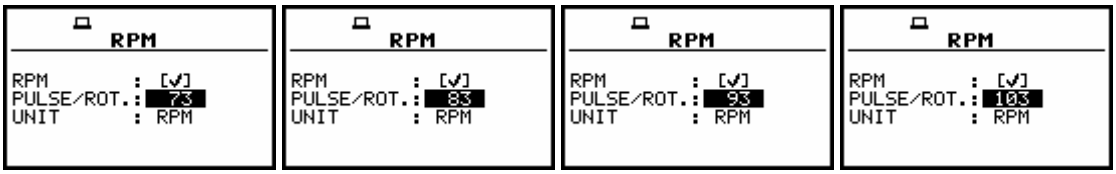
RPM window; the RPM selection

5.8.2 Selecting the number of pulses / rotations - PULSE / ROTATION

The **PULSE / ROTATION** enables the user to select the number of pulses / rotations. Available values are as follows: **1**, **2**, .. **360**. The required parameter can be set by means of the **<◄>**, **<►>** push-buttons (with the step equal to 1) or by means of the **<◄>**, **<►>** push-buttons pressed together with the **<SHIFT>** one (with the step equal to 10). The confirmation of the change made in the position requires pressing the **<ENTER>** push-button, which simultaneously closes the window. The **RPM** window is closed ignoring any changes made in there, after pressing any time the **<ESC>** push-button.



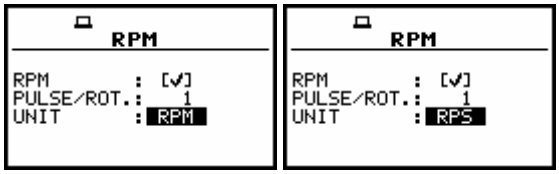
RPM window; the PULSES/ROTATIONS selection with 1 unit step



RPM window; the PULSES/ROTATIONS selection with 10 unit step

5.8.3 Selecting the unit of RPM measurement - UNIT

The **UNIT** enables the user to select the unit of the measurement. In this position two option are available **RPM** – **revolutions per minute** and **RPS** – **revolutions per second**. The selection of the unit is made by means of the **<◄>**, **<►>** push-buttons. The confirmation of the change made in the position requires pressing the **<ENTER>** push-button, which simultaneously closes the window. The **RPM** window is closed ignoring any changes made in there, after pressing any time the **<ESC>** push-button.



RPM window; the UNIT selection

6 DATA AVAILABLE ON THE DISPLAY - DISPLAY

In order to open the **DISPLAY** list the user has to:

- press the **<MENU>** push-button,
- select from the main list, using the **<▲>**, **<▼>** (or **<◄>**, **<►>**)push-buttons, the **DISPLAY** text (highlight it inversely),
- press the **<ENTER>** push-button.

Pressing the **<SHIFT>** and **<▲>** (or **<SHIFT>** and **<◄>**) results in a movement to the first position of the opened list and pressing the **<SHIFT>** and **<▼>** (or **<SHIFT>** and **<►>**) results in a movement to the last position of the opened list.

Display in the main list; the DISPLAY text highlighted (displayed inversely)

The **DISPLAY** list is used for setting the various parameters, which are mainly dedicated for the control of the display. The following items are present on this list:

DISPLAY MODES enables one to select the mode of the measurement results presentation;

DISPLAY SETUP enables one to change the scale in the graphical modes of result's presentation and the parameters of the logger's result presentation;

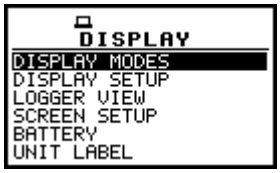
LOGGER VIEW enables one to select and present the results stored in the logger's files;

SCREEN SETUP enables one to set the contrast and the switch on/off the backlight timeout of the instrument's display;

BATTERY it informs the user about the source of powering of the instrument and current power supply voltage;

UNIT LABEL informs the user about the serial number of the instrument, the version of the internal software and the standards to which conform the measurement results.

In each available position any change is performed by means of the **<▲>**, **<▼>** and **<◄>**, **<►>** push-buttons. In order to confirm the selection the **<ENTER>** push-button has to be pressed. After this confirmation, the opened window or list is closed. In order to ignore any changes made in the opened window or list the user has to press the **<ESC>** push-button.



Display with the DISPLAY list

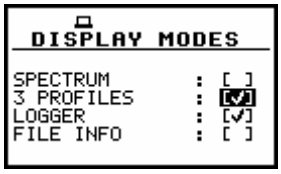
6.1 Selection of the modes of measurement results presentation - DISPLAY MODES

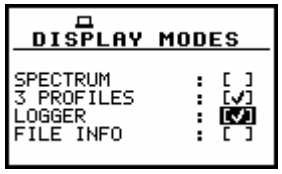
The **DISPLAY MODES** sub-list **enables one the selection of the currently available modes of displaying the results of measurement**. The selection is made by placing or replacing the special

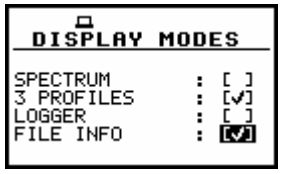
character in the inversely displayed position of the **DISPLAY MODES** sub-list by means of the **<◄>**, **<►>** push-buttons. In order to confirm the selection the user has to press the **<ENTER>** push-button. The mode of the results presentation is related with the selection of the instrument's function (**VLM**, **1/1 OCTAVE**, **1/3 OCTAVE**, **FFT** analyser etc.). Only One Profile mode cannot be switched off independently from the current mode of the instrument.

For the **Vibration Level Meter** the following possibilities of the measurement results presentation are available:

- **One Profile**,
- **3 PROFILES**,
- **LOGGER** (time history)
- **FILE INFO**.

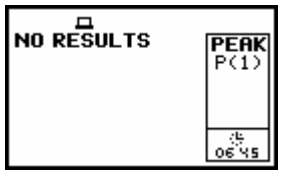
a) 

b) 

c) 

DISPLAY MODES windows in VM

The **LOGGER** mode of results presentation is available if, and only if, the data from at least one profile are logged in the logger's file. If the **LOGGER** position is switched on (**[√]**) but there was nothing stored in the logger's file (in the selected profile there were **selected results** (**PEAK**, **P–P**, **MAX** or **RMS** in the case of **VM**) but the instrument still **waits** for the logger results, i.e. the **LOGGER STEP** is long**,** the **NO RESULTS** text is displayed. When the **LOGGER** is selected as active and the **LOGGER** positions in all profiles are not selected, the **LOGGER** mode of results presentation is skipped.



Display in the LOGGER mode when there is nothing in the logger to be displayed (after setting LOGGER as active)

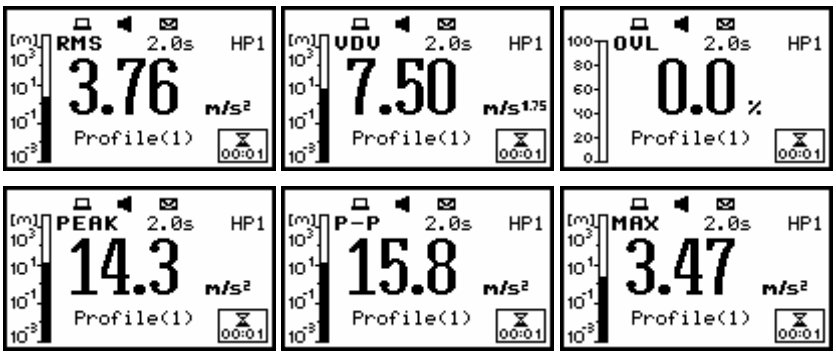
The display with the measurement result in so-called one profile mode is presented below. On the top of the display (under the icons line) there are the following data: the function name (**RMS**, **VDV**, **OVL**, **PEAK**, **P–P**, **MTVV** in the case of vibration measurements), the detector time constant (in **VM** when the detector is exponential: **100 ms**, **125 ms**, **.. 10.0 s**, **..** or **Lin** (for **RMS** result) when the detector is linear)

***Notice**: In the case of **LINEAR RMS INTEGRATION** (path: MENU / SETUP / RMS INTEGRATION / LINEAR) for **RMS** result on the display appears **Lin.** instead of detector time constanst.*

***Notice**: There is not any indication of the detector in the case of **PEAK** and **OVL** results.*

The name of the implemented filter (*path: MENU / INPUT / PROFILE x / FILTER*) is presented as the last element of the first line (**HP1**, **HP3**, **HP10**, **Vel1**, **Vel3**, **Vel10**, **VelMF**, **Dil1**, **Dil3**, **Dil10**, **KB**, **Wk**, **Wd**, **Wc**, **Wj**, **Wm**, **Wh**, **Wg**, **Wb** in **VM**).

The result of the measurement together with its unit (dB or m/s^2 for almost all results and % only for **OVL**) is given in the second line. The profile, the results are coming from, is visible in the bottom of the display (**Profile(1)**, **Profile(2)** or **Profile(3)**). The vertical line showing the value of the result in the analogue-like form together with the scale is presented at the left side of the display. The real time clock is visible in the bottom right corner of the display. The selection of the result is made pressing the **<◄>**, **<►>** push-buttons.



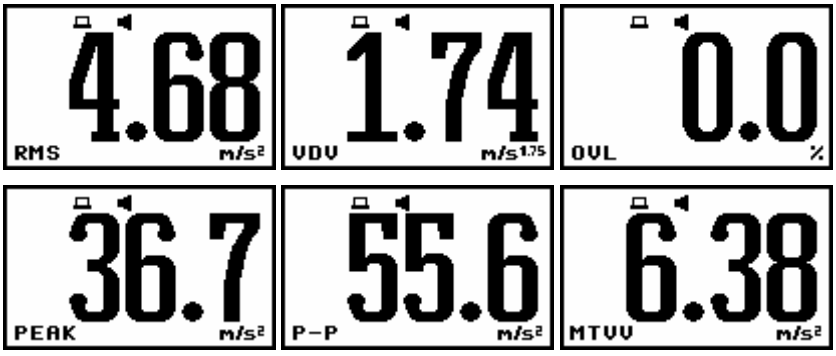
Measurement results in VM presented in one profile mode

The profile is changed after pressing the **<SHIFT>** and **<▲>** or **<SHIFT>** and **<▼>** push-buttons. The same result can be achieved after pressing the **<ALT>** and **<◄>** or **<ALT>** and **<►>** push-buttons.

There is also possible to present differently the measurement data in one profile after pressing the **<ALT>** and **<▲>** or **<ALT>** and **<▼>** push-buttons. In this case, the result is displayed with the biggest possible fonts. The name of the result together with the units is given in the bottom line. The current result from a selected profile is changed after pressing the **<►>** or the **<◄>** push-buttons. The profile the results are coming from is changed after pressing the **<SHIFT>** and **<▲>** or **<SHIFT>** and **<▼>** but the **profile's number is not visible** on the display.

The same result can be achieved after pressing the **<ALT>** and **<◄>** or **<ALT>** and **<►>** push-buttons. When the statistics level **Lxx** is presented, the another levels from the set of ten values are available after pressing the **<SHIFT>** and **<◄>** or **<SHIFT>** and **<►>** push-buttons.

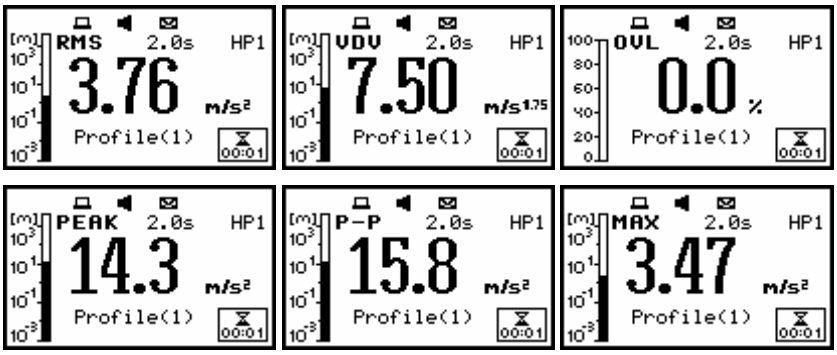
The presentation mode is changed (to **3 PROFILES** and **LOGGER** or **FILE INFO** if all of them are currently available) after pressing the **<▲>** or **<▼>** push-buttons.



Measurement results in VM and unknow profile presented with the biggest fonts in one profile mode

When the measurements are performed, what is indicated on the display by the **loudspeaker** icon, the clock displayed in the right bottom shows the current second of the measurement. The value presented there belongs to the range [**1**, **INTEGRATION PERIOD**].

The **envelope** icon visible above and below indicates that the selected results from the profiles (*path: MENU / INPUT / PROFILE x*) are logged.



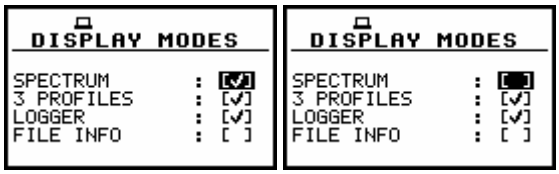
Displays during the measurement performed in VM with the active LOGGER (an envelope icon)

The results can be saved using **SAVE**, **SAVE NEXT** or **AUTO SAVE** functions after the end of the measurements caused by the any reason (remote control, pressed **<STOP>** push-button or fulfilment of the **INTEGR. PERIOD** / **REP.CYCLE** condition).

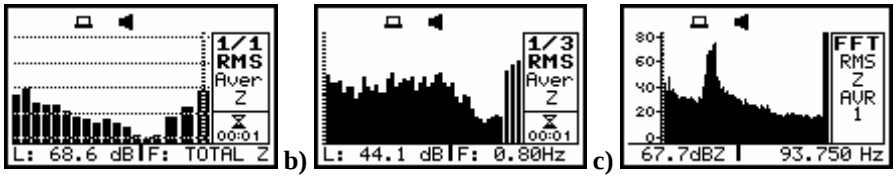
It is not possible to save the results during the execution of the measurements.

6.1.1 Switching on/off spectrum view - SPECTRUM

The **SPECTRUM** position is accesible only in **1/1 OCTAVE**, **1/3 OCTAVE** and **FFT** function (*path: MENU / FUNCTION / MEASUREMENT FUNCTION*). The possibility of the measurement results presentation in **SPECTRUM** can be switched on or off placing or replacing the special character in the displayed inversely line with the **SPECTRUM** text by means of the **<◄>**, **<►>** push-buttons. In order to confirm the selection the user has to press the **<ENTER>** push-button. This confirmation closes also the **DISPLAY MODES** sub-list. The sub-list can be also closed after pressing the **<ESC>** push-button but the settings made there are ignored.



DISPLAY MODES windows, SPECTRUM position accessible

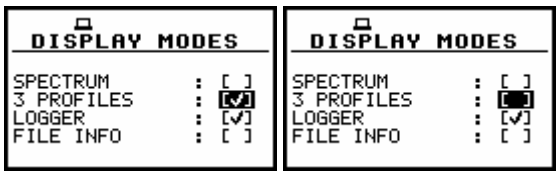


a) **b)** **c)**

Displays in SPECTRUM mode for 1/1 OCTAVE (a), 1/3 OCTAVE (b) and FFT (c)

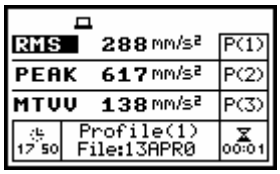
6.1.2 Switching on/off three profiles view - 3 PROFILES

The possibility of the measurement results presentation in **3 PROFILES** can be switched on or off placing or replacing the special character in the displayed inversely line with the **3 PROFILES** text by means of the **<◄>**, **<►>** push-buttons. In order to confirm the selection the user has to press the **<ENTER>** push-button. This confirmation closes also the **DISPLAY MODES** sub-list. The sub-list can be also closed after pressing the **<ESC>** push-button but the settings made there are ignored.



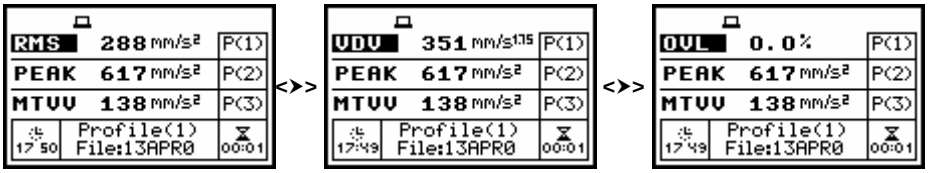
Setting on and off the accessibility of three profiles presentation mode

The exemplary measurement results presented in the **3 PROFILES** mode when the results from three profiles are on the display are given below. In the case of the **3 PROFILES** in three consecutive lines the following data are seen: the name of the function, the result together with the units and the profil number (**P(1)**, **P(2)**, **P(3)**). The current real time, the profile from which the result is displayed inversely and the name of the file, in which the results are saved, are displayed at the bottom. At the right bottom, there is another clock, which displays real time in the case when the measurements are performed and the current second of the measurement – in the opposite case.



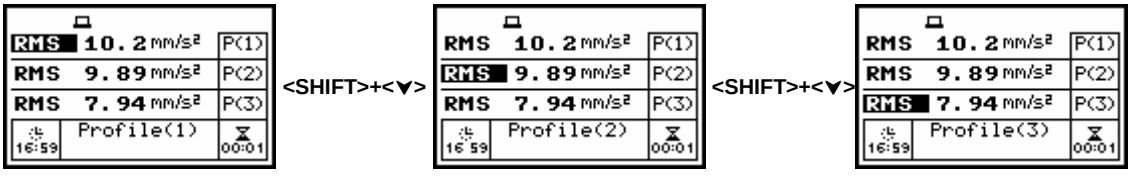
Measurement results in 3 PROFILES mode

The presented result in a selected profile is changed using the **<◄>**, **<►>** push-buttons as presented below.



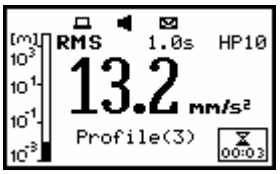
Results in 3 PROFILES mode; selection of the result in a profile

The change of the selected (displayed inversely) profile is done pressing the **<SHIFT>** and **<▼>** or **<SHIFT>** and **<▲>** push-buttons. The same result can be achieved after pressing the **<ALT>** and **<◄>** or **<ALT>** and **<►>** push-buttons.



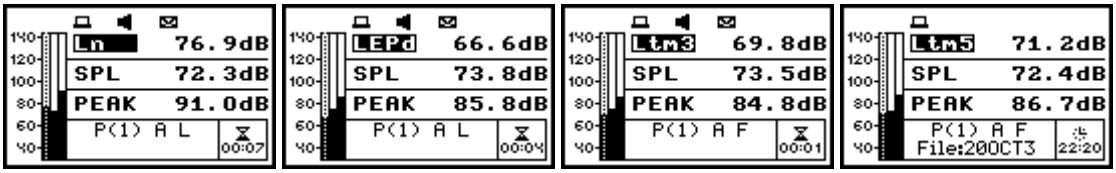
Results in 3 PROFILES mode; selection of the profile

During the measurements, which are indicated by the **loudspeaker** icon, the current time from the range [**1**, **INTEGRATION PERIOD**] is displayed on the right bottom clock. The **envelope** icon indicates that results selected in the profiles (*path: MENU / INPUT / PROFILE x*) are logged.



Displays during the measurement performed with the active LOGGER (envelope icon)

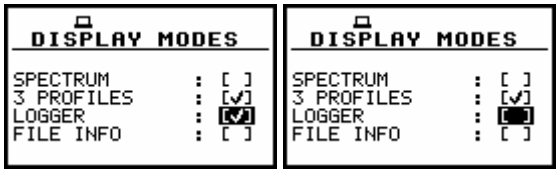
There is also possible to present differently the measurement data in **3 PROFILES** after pressing the **<ALT>** and **<▲>** or **<ALT>** and **<▼>** push-buttons. In this case, at the left side of the display three analogue-like indicators are shown, each one for the selected result from a profile. The currently active profile is marked by the cursor and inversely displayed name of the function. The filter selected in that profile and the integration type (in the case of the linear one) or the detector type (in the case of exponential) are written below the measurement results. During the measurements, the bottom right clock displays the current time from the range [**1**, **INTEGRATION PERIOD**]. The current result from a selected profile is changed after pressing the **<►>** or the **<◄>** push-buttons. The profile the results are coming from is changed after pressing the **<SHIFT>** and **<▲>** or **<SHIFT>** and **<▼>**. The same result can be achieved after pressing the **<ALT>** and **<◄>** or **<ALT>** and **<►>** push-buttons. When the statistics level **Lxx** is presented, the another levels from the set of ten values are available after pressing the **<SHIFT>** and **<◄>** or **<SHIFT>** and **<►>** push-buttons. The results can be saved using **SAVE**, **SAVE NEXT** or **AUTO SAVE** functions after the end of the measurements caused by the selected reasons. It is not possible to save the results during the execution of the measurements. In the case when the saving was done, the name of the logger's file is presented in the bottom line of one profile display and the clock starts to show the real time. The presentation mode is changed (to one profile, **STATISTICS** and **LOGGER** or **FILE INFO** if all of them are currently available) after pressing the **<▲>** or **<▼>** push-buttons.



Displays during the measurement performed in LEVEL METER mode with the active LOGGER (the first three) and after saving the results (the last one)

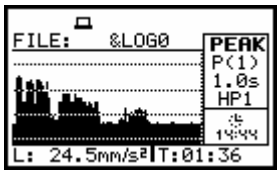
6.1.3 Setting on/off logger view - LOGGER

The possibility of the presentation of the measurement results, which are saved in the logger, on the instrument's display can be switched on or off placing or replacing the special character in the displayed inversely line with the **LOGGER** text by means of the **<◄>**, **<►>** push-buttons. In order to confirm the selection the user has to press the **<ENTER>** push-button. This confirmation closes also the **DISPLAY MODES** sub-list. The sub-list can be also closed after pressing the **<ESC>** push-button but the settings made there are ignored.



Setting on and off the accessibility of LOGGER presentation mode

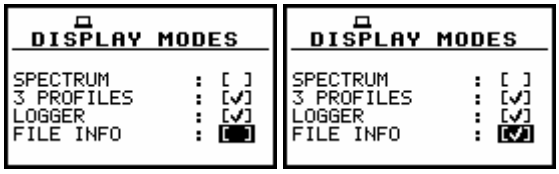
The results saved in the logger can be presented in three different modes which differ slightly each other. These modes are changed after pressing the **<ALT>** and **<▲>** or the **<ALT>** and **<▼>** push-buttons or they can be set in the **VIEW** (*path: MENU / DISPLAY / DISPLAY SETUP / LOGGER VIEW / VIEW*).



Exemplary displays with the measurement results saved in the logger

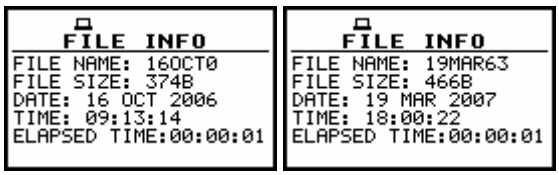
6.1.4 Setting on/off the view of the file description - FILE INFO

The possibility of the additional file description presented on the instrument's display can be switched on or off placing or replacing the special character in the displayed inversely line with the **FILE INFO** text by means of the **<◄>**, **<►>** push-buttons. In order to confirm the selection the user has to press the **<ENTER>** push-button. This confirmation closes also the **DISPLAY MODES** sub-list. The sub-list can be also closed after pressing the **<ESC>** push-button but the settings made there are ignored.



Setting on and off the file description presentation mode

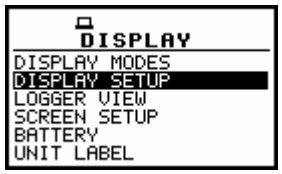
In the **FILE INFO** window the file name, its size, date and time of the registration of the main results (cf. App. B) and time (so-called ***ELAPSED TIME***) during which the main results saved in the logger were measured. The value presented there belongs to the range [**1**, **INTEGRATION PERIOD**] and depends on the moment and the way the measurements were stopped.



Exemplary contents of the FILE INFO window

6.2 Setting the parameters of the graphical modes - DISPLAY SETUP

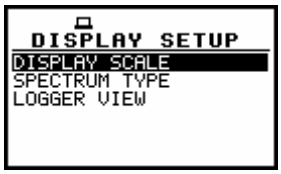
The **DISPLAY SETUP** sub-list enables the user to change several parameters of the graphical results presentations. Using the **DISPLAY SCALE** sub-list for example, one can select the scale in the available modes of graphical presentation of the measurement results (time history in the **LOGGER** and spectra in the **SPECTRUM**). Using the **TOTAL VALUES** sub-list it is possible to select the weighting filters used in the calculation of the Total values. This sub-list appears on the display only in the case of **1/1 OCTAVE** or **1/3 OCTAVE** analyser. Using the **SPECTRUM TYPE** sub-list, which appears on the display only in **VM**, it is possible to select the spectrum type which has to be presented during the vibration measurements. In order to enter the **DISPLAY SETUP** list one has to press the **<ENTER>** push-button on the inversely displayed **DISPLAY SETUP** text of the **DISPLAY** list. The **DISPLAY SETUP** sub-list is closed and the instrument returns to the **DISPLAY** after pressing the **<ESC>** push-button, which ignores any changes in the positions of the sub-list or the **<ENTER>** push-button, which confirms the changes.

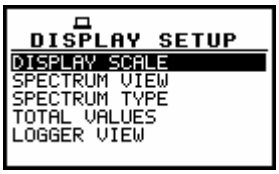


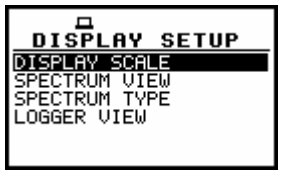
DISPLAY list with the DISPLAY SETUP selected

6.2.1 Setting the scale of the presentation and the display's grid - DISPLAY SCALE

The **DISPLAY SCALE** sub-list enables the user to change the scale in the available modes of graphical presentation of the measurement results and switch on/off the grid. In order to enter this list one has to press the **<ENTER>** push-button on the inversely displayed **DISPLAY SCALE** text of the **DISPLAY SETUP** sub-list. The **DISPLAY SCALE** sub-list is closed and the instrument returns to the **DISPLAY SETUP** sub-list after pressing the **<ESC>** (the settings made there are not confirmed) or the **<ENTER>** push-button (the settings are confirmed).

a) 

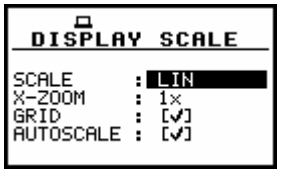
b) 

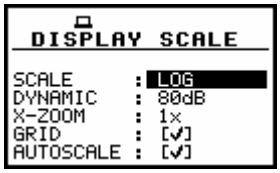
c) 

DISPLAY SETUP windows in VLM (a) in 1/1 and 1/3 OCTAVE (b) and in FFT (c)

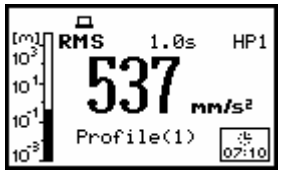
6.2.1.1 Setting the scale of the measurement results presentation - SCALE

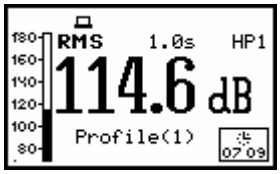
In the **SCALE** position two options are available: **LIN** (linear) and **LOG** (logarithmic). In the case of the first one the graphical presentation and the units both are linear. In the latter case the graphical presentation is given in the logarithmic scale and the measurement results are expressed in decibels (the result is related to the values set in the **REFERENCE LEVEL** – *path: MENU / SETUP / REFERENCE LEVEL*). It is possible to set the required option using the **<◄>**, **<►>** push-buttons. The confirmation of the selection is made by pressing the **<ENTER>** push-button. The return without taking into account any change is made after pressing the **<ESC>** push-button.





Displays with the possible options of the vibration SCALE

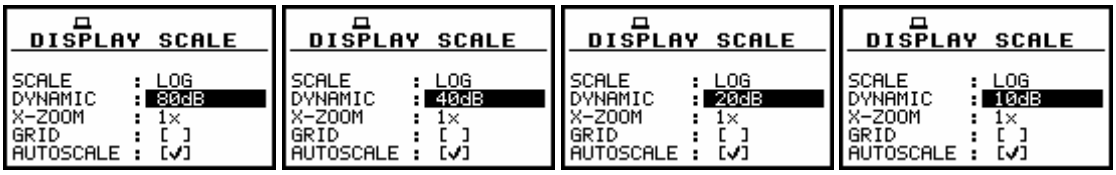
a) 

b) 

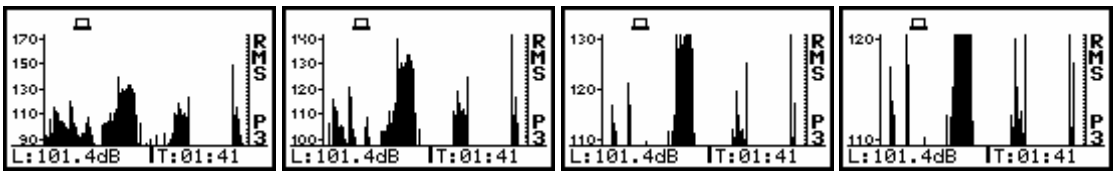
Measurement results presented in linear [mm/s^2] (a) and logarithmic [dB] (b) scale

6.2.1.2 Scaling the vertical axis of the graphical mode presentation - DYNAMIC

The **DYNAMIC** position appears on the display when logarithmic (**LOG**) scale is selected in **SCALE** position. It enables the user to select the proper scaling of the graphical mode presentation. In the case of the vertical axis one can obtain the double, four times and eight times expansion (as the default the vertical axis corresponds to 80 dB, after expansion it corresponds to 40 dB, 20 dB and 10 dB – respectively) using the **<◄>**, **<►>** push-buttons and pressing the **<ENTER>** for the confirmation.



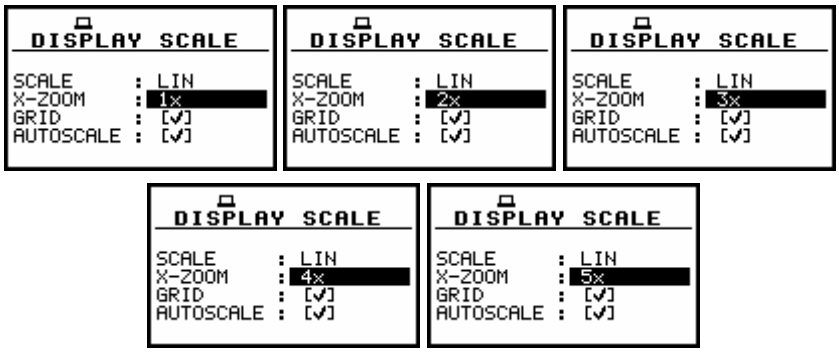
Displays with the possible values of the DYNAMIC parameter



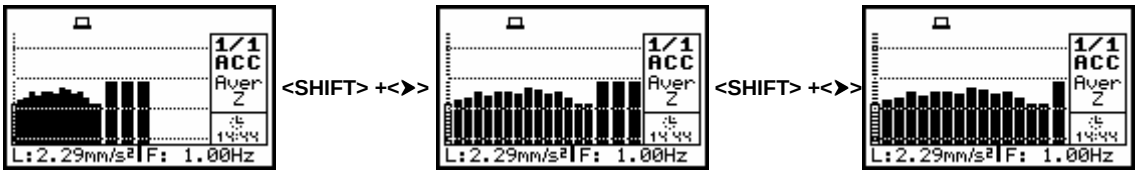
Displays with the results stored in the logger presented with different DYNAMIC parameter

6.2.1.3 Scaling the horizontal axis of the graphical presentation - X–ZOOM

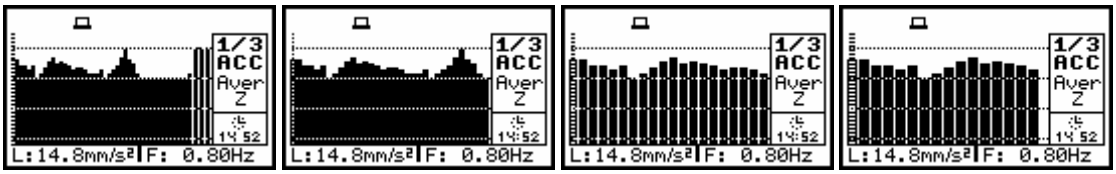
The **X–ZOOM** enables the user to change the horizontal axis in the **SPECTRUM** presentation mode by means of the **<➤>**, **<➤➤>** push-buttons. In order to confirm the selection the user has to press the **<ENTER>** push-button, which closes also the **DISPLAY SCALE** sub-list. The sub-list can be also closed after pressing the **<ESC>** push-button but the settings made there are ignored. In **1/1 OCTAVE** mode available values are **3x**, **4x** and **5x**. In **1/3 OCTAVE** mode available values are **2x**, **3x**, **5x**. In **1/1 OCTAVE** and **1/3 OCTAVE** in spectrum presentation mode the **X-ZOOM** can be changed by pressing **SHIFT** and **<➤➤>** push-buttons.



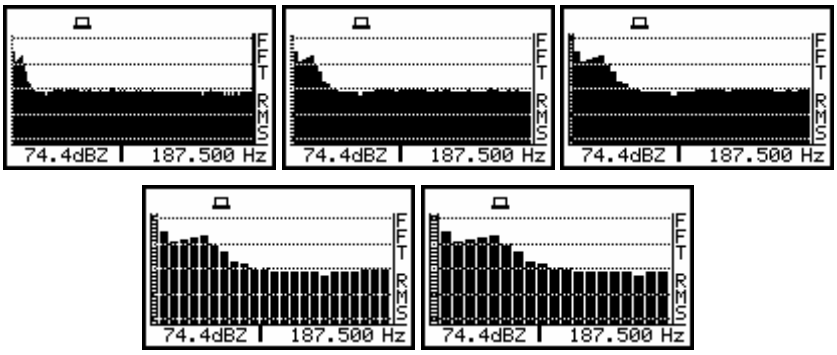
DISPLAY SCALE windows; the X–ZOOM selection



Displays in 1/1 OCTAVE SPECTRUM 3x, 4x, and 5x X–ZOOM



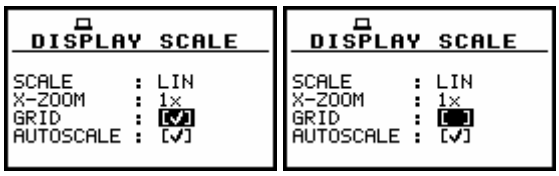
Displays in 1/3 OCTAVE SPECTRUM 2x, 3x, 4x, and 5x X–ZOOM



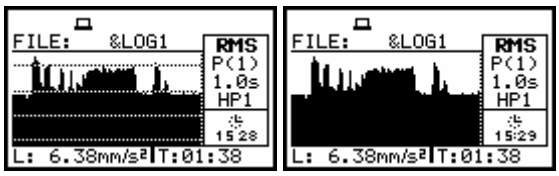
Displays in FFT SPECTRUM 1x, 2x, 3x, 4x, and 5x X–ZOOM

6.2.1.4 Switching on/off the grid in the graphical mode presentation - GRID

The **GRID** enables the user to switch on or off the grid in any graphical presentation placing or replacing the special character in the displayed inversely line with the **GRID** text by means of the **<◄>**, **<►>** push-buttons. In order to confirm the selection the user has to press the **<ENTER>** push-button. This confirmation closes also the **DISPLAY SCALE** sub-list. The sub-list can be also closed after pressing the **<ESC>** push-button but the settings made there are ignored.



Displays with the grid switched on and off

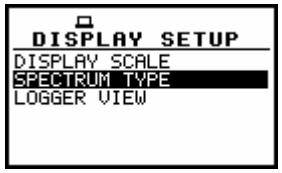


Displays with the grid switched on and off

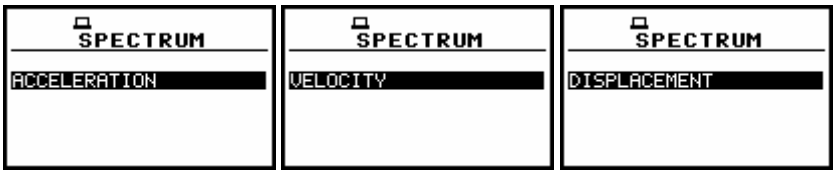
6.2.2 Selection of the Spectrum Type in VM - SPECTRUM TYPE

The **SPECTRUM TYPE** enables the user to change the spectrum type. This sub-list contains three positions: **ACCELERATION**, **VELOCITY** and **DISPLACEMENT**.

In order to enter this sub-list one has to press the **<ENTER>** push-button on the inversely displayed **SPECTRUM TYPE** text of the **DISPLAY SETUP** sub-list. The user can selected the required type of the spectrum presented on the display by means of the **<◄>**, **<►>** push-buttons. The **SPECTRUM TYPE** window is closed and the instrument returns to the **DISPLAY SETUP** list after pressing the **<ESC>** push-button, which ignores any changes in the positions of the sub-list or the **<ENTER>** push-button, which confirms the changes.



DISPLAY SETUP window; the SPECTRUM TYPE text highlighted



SPECTRUM TYPE windows with the available values

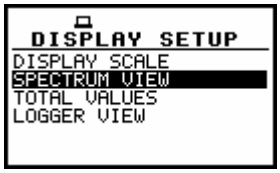
6.2.3 Setting the parameters of the logger files presentation - SPECTRUM VIEW

The **SPECTRUM VIEW** enables the user to change the shape of the graphical presentation (**VIEW**) and a **TYPE** parameter as well as to activate the presentation on the display the **MAX** and **MIN** spectrum.

In the **VIEW** position the **EXTENDED**, **FULL** and **NORMAL** views are available (by means of the **<◄>**, **<►>** push-buttons).

In the **TYPE** position the **AVERAGED**, **INSTANTENOUS**, **MAX** and **MIN** texts are available (by means of the **<◄>**, **<►>** push-buttons).

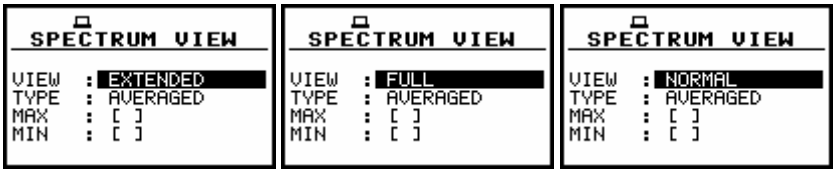
In order to enter this window one has to press the **<ENTER>** push-button on the inversely displayed **LOGGER VIEW** text of the **DISPLAY SETUP** sub-list. The **LOGGER VIEW** window is closed and the instrument returns to the **DISPLAY SETUP** sub-list after pressing the **<ESC>** (the settings made there are not confirmed) or the **<ENTER>** push-button (the settings are confirmed).



DISPLAY SETUP window; the SPECTRUM VIEW text highlighted

6.2.3.1 Selection of the graphical presentation type - VIEW

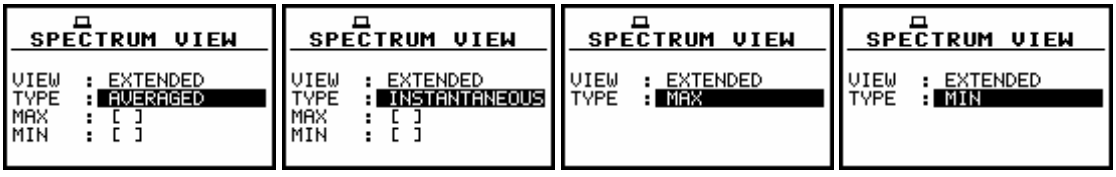
In the **VIEW** position the **EXTENDED**, **FULL** and **NORMAL** texts are available after pressing the **<◄>**, **<►>** push-buttons. These texts correspond to the slightly different data presented on the display in the graphical presentation modes.



SPECTRUM VIEW windows; the VIEW selection

6.2.3.2 Selection of the spectrum type for the presentation - TYPE

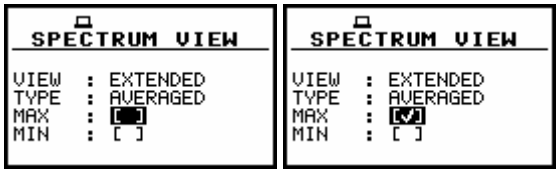
In the **TYPE** position the **AVERAGED**, **INSTANTENOUS**, **MAX** and **MIN** texts are available after pressing the **<◄>**, **<►>** push-buttons. Each text corresponds to the different spectrum type to be presented on the display in the graphical presentation modes.



SPECTRUM VIEW windows; the TYPE selection

6.2.3.3 Selection of the MAX spectrum for the presentation – MAX

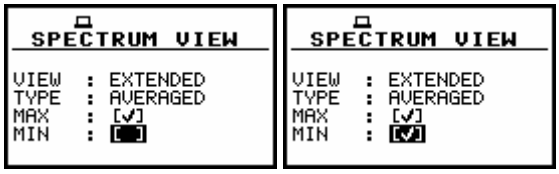
In the **MAX** position the corresponding spectrum can be selected (by means of the **<◄>**, **<►>** push-buttons) to be presented on the display in the graphical presentation modes.



SPECTRUM VIEW windows, the MAX selection

6.2.3.4 Selection of the MIN spectrum for the presentation - MIN

In the **MIN** position the corresponding spectrum can be selected (by means of the **<◄>**, **<►>** push-buttons) to be presented on the display in the graphical presentation modes.

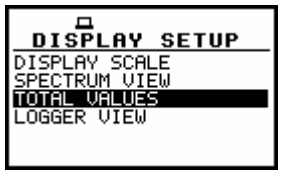


SPECTRUM VIEW windows; the MIN selection

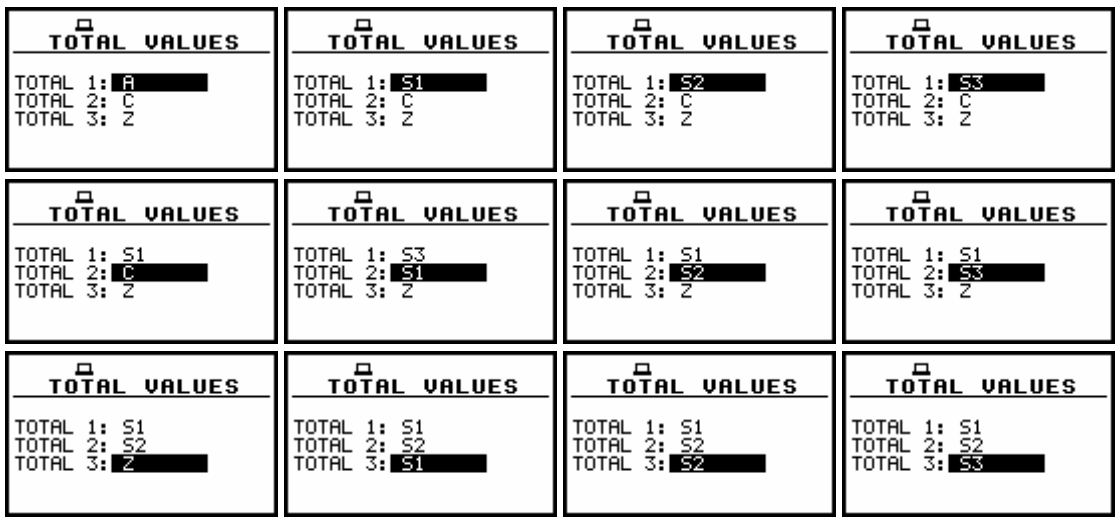
6.2.4 Selection of the Weighting Filters - TOTAL VALUES

The **TOTAL VALUES**, which is available only in **1/1 OCTAVE** or **1/3 OCTAVE** analysis, enables the user to select the weighting filter.

In order to enter this window one has to press the **<ENTER>** push-button on the inversely displayed **TOTAL VALUES** text of the **DISPLAY SETUP** sub-list. The **TOTAL VALUES** window is closed and the instrument returns to the **DISPLAY SETUP** sub-list after pressing the **<ESC>** (the settings made there are not confirmed) or the **<ENTER>** push-button (the settings are confirmed).

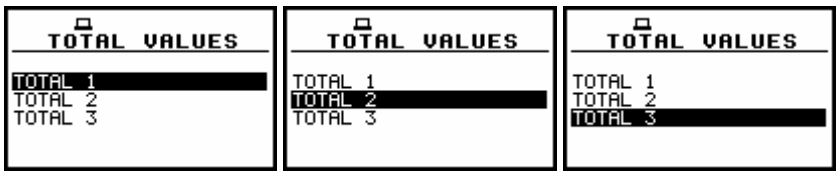


DISPLAY SETUP window; the TOTAL VALUES text highlighted



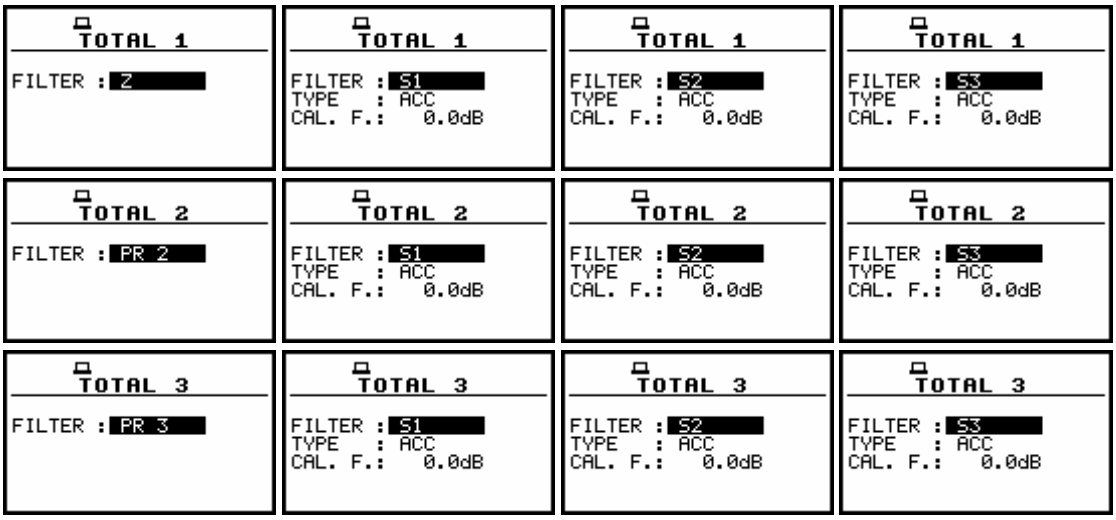
TOTAL VALUES windows; the weighting filters selection in SM

In the case of vibration mode after entering the **TOTAL VALUES** position on the display appears sub-list with the **TOTAL 1**, **TOTAL 2** and **TOTAL3** positions. The slection of the position is made by **<◄>**, **<►>** push-buttons and pressing **<ENTER>** for the confirmation.



TOTAL VALUES windows in VM; the TOTALx selected

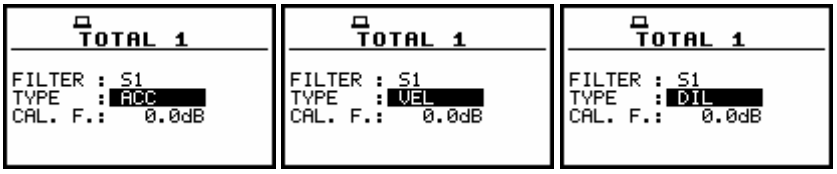
In the **TOTALx** window for user filters (**S1**, **S2**, **S3**) selected in the **FILTER** position, the **TYPE** and **CAL. F.** positions appear on the display.



TOTAL x windows; the weighting filters selection in VM

6.2.4.1 Selecting the type of the spectrum in VM to be presented - TYPE

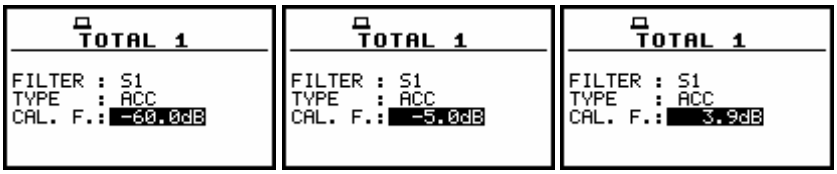
In the **TYPE** three options are available: **ACC** (acceleration), **VEL** (velocity) and **DIL** (displacement). The selection is made by **<◄>**, **<►>** push-buttons and pressing **<ENTER>** to confirm.



TOTALx windows; the TYPE selection

6.2.4.2 Setting the calibration factor for the presented spectrum in VM - CAL. F.

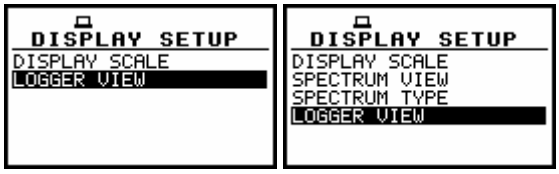
In the **CAL. F.** the user can introduce CALIBRATION FACTOR value from -60.0 dB to 60.0 dB using **<◄>**, **<►>** push-buttons with 0.1 dB step, or using **<◄>**, **<►>** push-buttons with the **<SHIFT>** with 1 dB step. In order to confirm all changes made in this window the user has to press the **<ENTER>**. After pressing **<ESC>** the settings made there are ignored and the instrument returns to the **TOTAL VALUES** window.



TOTALx windows; CALIBRATION FACTOR setting

6.2.5 Setting the parameters of the logger files presentation - LOGGER VIEW

The **LOGGER VIEW** enables the user to change the shape of the graphical presentation and a **TIME** parameter. In order to enter this window one has to press the **<ENTER>** push-button on the inversely displayed **LOGGER VIEW** text of the **DISPLAY SETUP** sub-list. The **LOGGER VIEW** window is closed and the instrument returns to the **DISPLAY SETUP** sub-list after pressing the **<ESC>** (the settings made there are not confirmed) or the **<ENTER>** push-button (the settings are confirmed).

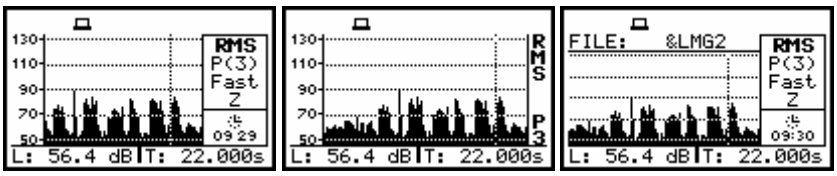


DISPLAY SETUP windows, the LOGGER VIEW text highlighted

6.2.5.1 Selecting the shape of the graphical presentation - VIEW

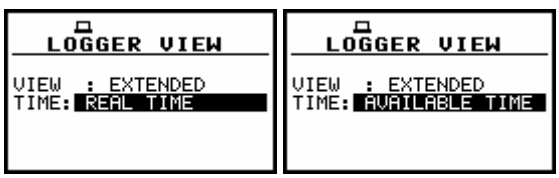
LOGGER VIEW windows with the possible values of the VIEW parameter

The **VIEW** enables the user to select the shape of the graphical mode presentation. Three different views are available which are called as **NORMAL**, **FULL** and **EXTENDED**. The selection is made by means of **<◄>**, **<►>** push-buttons and pressing the **<ENTER>** for the confirmation. The user can achieve the same effect after pressing the **<ALT>** and **<▲>** or the **<ALT>** and **<▼>** push-buttons.



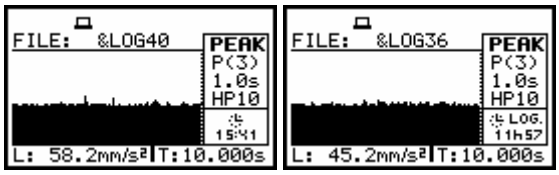
Displays with the possible values of the VIEW parameter

6.2.5.2 Setting the time to be presented - TIME



LOGGER VIEW windows with the possible values of the TIME parameter

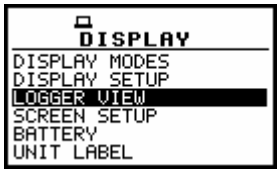
The **TIME** enables the user to select the time to be presented with the logger's file results. The **REAL TIME** selection means that on the display the real time is visible, while **AVAILABLE TIME** means that time after which the logger's memory will be filled up by the current measurement result is given there. The selection is made using the **<◄>**, **<►>** push-buttons and pressing the **<ENTER>** for the confirmation.



Displays with the possible values of the TIME parameter

6.3 Selection of the logger's file to the display presentation - LOGGER VIEW

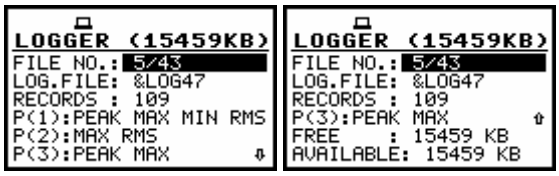
The **LOGGER enables the user to examine the contents of the logger files**. In order to open this window the user has to press the **<ENTER>** push-button when the **LOGGER VIEW** text is displayed inversely.



DISPLAY list; the LOGGER VIEW text highlighted

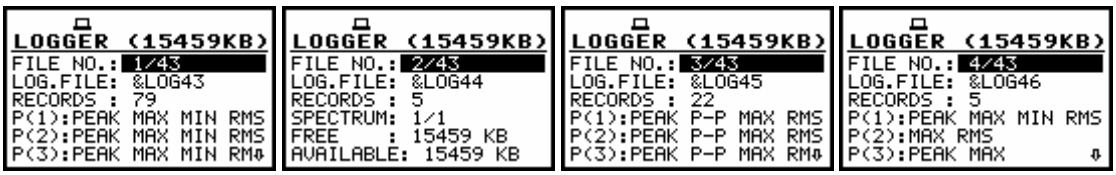
In the first line the available still logger's memory is displayed followed by:

- The selected number of the logger's file and the number of all saved files (**FILE NO.:**).
- The name of the logger's file (**LOG.FILE:).**
- The number of the records in the file, which name is displayed in the previous line (**RECORDS:**).
- The results saved (if any are present) in the logger from the first profile (**P(1):**).
- The results saved (if any are present) in the logger from the second profile (**P(2):**).
- The results saved (if any are present) in the logger from the third profile (**P(3):**).
- The type of spectrum (if 1/1 OCTAVE , 1/3 OCTAVE or FFT).
- The size of the remaining free memory for logger files (**FREE:**).
- The size of the available memory for logger file (**AVAILABLE:**).



Displays in the LOGGER VIEW sub-list

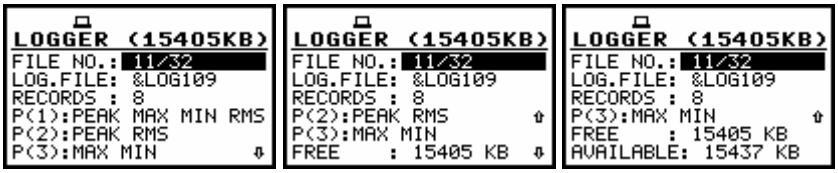
The change of the number of the logger's file is done by pressing the **<◄>**, **<►>** push-buttons.



Displays in the LOGGER VIEW sub-list; the selection of the file to be seen

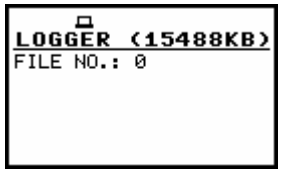
The size of the **FREE** memory for logger files is equal to the size of the **AVAILABLE** memory for logger file in the case when the logger files were not deleted from the memory. If it has happened, the **FREE** memory is always smaller than **AVAILABLE**.

In order to increase the free memory space and achieve the available one, the user has to perform the defragmentation (*path: MENU / FILE / DEFRAGMENTATION / LOGGER DEFRAGMENT*.).



Displays in the LOGGER VIEW sub-list; the scrolling of the file to be seen

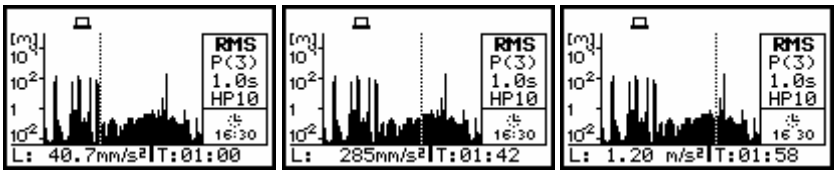
The display of the instrument after entering the **LOGGER VIEW** looks as on the figure below in the case when the logger's file does not exist (there was no measurement or the measurements were performed but with the settings **LOGGER: Off** (*path: MENU / INPUT / MEASUREMENT SETUP*).



Display in the LOGGER VIEW sub-list in the case when the files do not exist

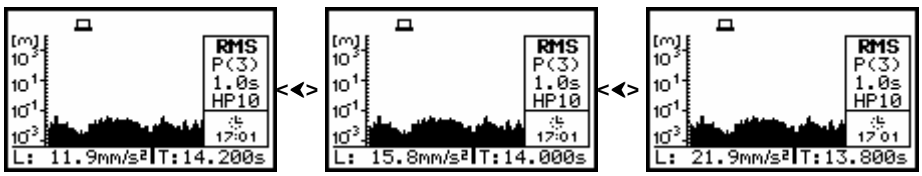
The contents of the selected logger's file is displayed after pressing the **<ENTER>** push-button. The cursor position is changed after pressing the **<◄>**, **<►>** push-buttons. The left end of the graphical presentation is reached immediately after pressing the **<SHIFT>** and **<◄>** while the right end - after pressing the **<SHIFT>** and **<►>** push-buttons.

The type of the registered result, the number of the profile the result is coming from, the related time from the beginning of the registration, the value with the units and the indicator of the filter are presented in the **NORMAL** and **EXTENDED** logger's view mode on the right side of the display.



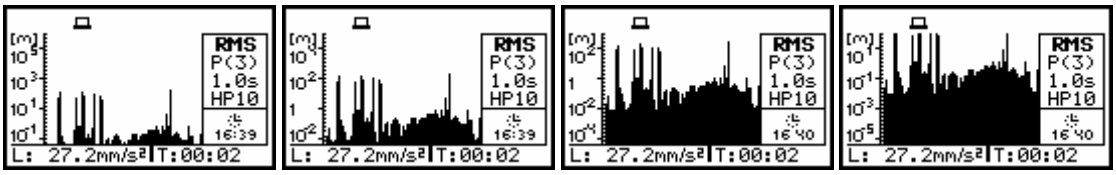
Displays with the selected logger's file; the change of the cursor position

The scrolling of the display to the right/left is made when the cursor is at the left/right end of the graphical presentation space and the **<◄>/ <►>** push-button is still pressed and in the file there are still the results.



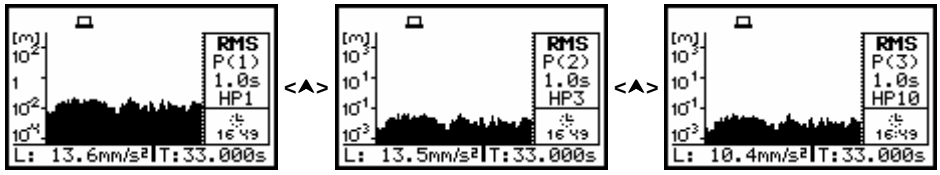
Display with the selected logger file the scrolling to the left

The position of the horizontal axis in relation to the vertical one can be changed after pressing the **<▲>**, **<▼>** push-buttons together with the **<SHIFT>** one.



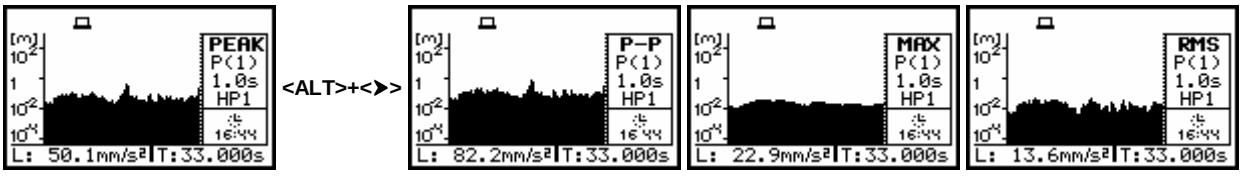
Displays with the selected logger's file; the change of the axis relation

The results from logger's file, coming from different profiles, are changed after pressing the **<▲>** or **<▼>** push-buttons – after each pressing the result from the next profile is displayed.



Displays with the selected logger's file; the change of the profile

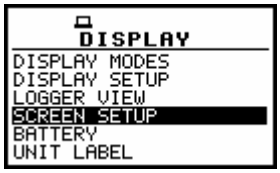
The results from logger's file, coming from the same profile, are displayed after each pressing of the **<ALT>** and **<◄>** or **<ALT>** and **<►>** push-buttons.



Displays with the selected logger's file; the change of the result from a profile

6.4 Setting the parameters of the display - SCREEN SETUP

The **SCREEN SETUP** window enables the user to set the proper contrast of the display and switch on the backlight's automatic switch off after a certain period (30 seconds). In order to enter the window one has to press the **<ENTER>** push-button on the inversely displayed **SCREEN SETUP** text of the **DISPLAY** list. The **SCREEN SETUP** window is closed and the instrument returns to the **DISPLAY** list after pressing the **<ESC>** or the **<ENTER>** push-button.



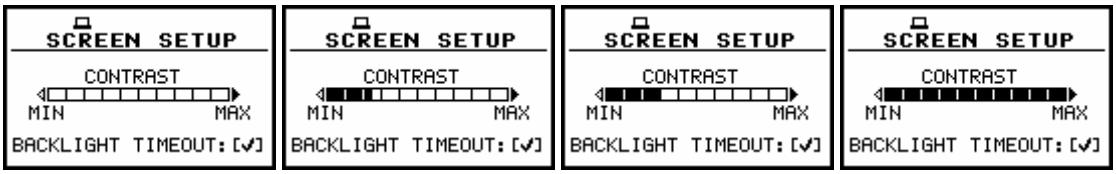
DISPLAY list; the SCREEN SETUP text highlighted

6.4.1 Setting the contrast of the display – CONTRAST

The **CONTRAST** enables the user to set the proper contrast of the display (by means of the **<◄>**, **<►>** push-buttons). The position is opened after pressing the **<ENTER>** push-button on the highlighted (displayed inversely) **CONTRAST** text. The user can select 21 different values of this parameter.

Notice**: The new value of the contrast is confirmed after each pressing of the* **<◄>** or **<►>** *push-buttons (new value is selected without any confirmation from the* ***<ENTER> *push-button).*

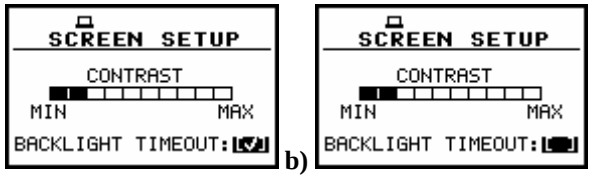
The window is closed and the instrument returns to the **DISPLAY** list after pressing the **<ESC>** or **<ENTER>** push-button.



SCREEN SETUP windows; the change of the contrast

6.4.2 Automatic switch off of the backlight - BACKLIGHT TIMEOUT

Taking into account the saving of the internal source of the instrument's power the backlight should be used relatively rare. It is possible to set the backlight's automatic switch off. In the case when this option is set, after 30 seconds from pressing **any push-button** the backlight is switched off. If it happened, the first pressing of any push-button would cause the switch on of the backlight. The confirmation of the selection is made by pressing the **<ENTER>** push-button. The return without taking into account any change is made after pressing the **<ESC>** push-button.



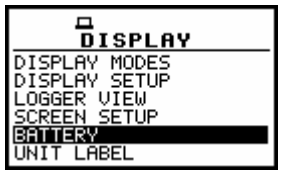
a) **b)**

SCREEN SETUP windows; the BACKLIGHT TIMEOUT active (a), and not active (b)

6.5 Checking the state of the internal battery – BATTERY

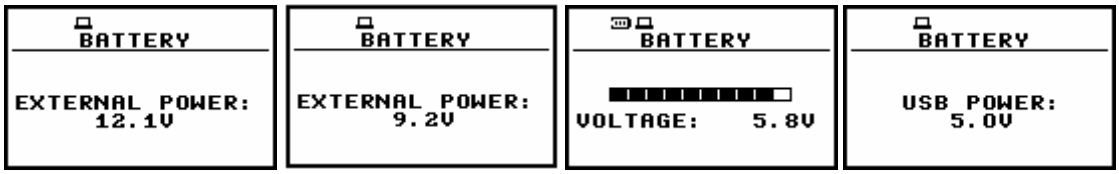
The **BATTERY enables the user to check the internal battery condition**. In order to enter the window one has to press the **<ENTER>** push-button on the inversely displayed **BATTERY** text of the **DISPLAY** list.

The **BATTERY** window is closed and the instrument returns to the **DISPLAY** list after pressing the **<ESC>** or the **<ENTER>** push-button.



DISPLAY list; the BATTERY text highlighted

The instrument can be powered from the external power supplier, from the external battery pack, from four AA standard or AA rechargeable batteries or from the USB interface when its USB Device socket is connected by means of the cable to a PC. The view presented on the display in each case is different. The current battery voltage is displayed together with its approximate state (in the graphical form).



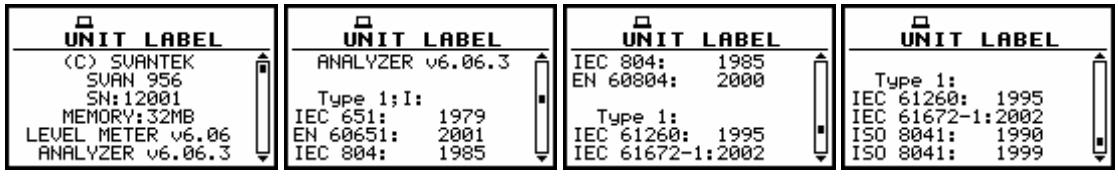
BATTERY windows for different sources powering the instrument

6.6 Checking specification of the instrument - UNIT LABEL

The **UNIT LABEL** enables the user to check **the type of the instrument**, **its serial number, the current software versions installed in it** and the standards, which the instrument fulfils. In order to enter the list one has to press the **<ENTER>** push-button on the inversely displayed **UNIT LABEL** text of the **DISPLAY** list. The **UNIT LABEL** sub-list is closed and the instrument returns to the **DISPLAY** list after pressing the **<ESC>** or the **<ENTER>** push-button.

DISPLAY list; the UNIT LABEL text highlighted

After pressing the **<◄>**, **<►>** (or **<▲>**, **<▼>**) push-buttons the displayed text is scrolled on the display and the user can check the number of the standard fulfilled by the instrument and the current software version. The window is closed and the instrument returns to the **DISPLAY** list after pressing the **<ESC>** or **<ENTER>** push-button.



UNIT LABEL windows opened and after scrolling with the <▲>, <▼> push-buttons

***Notice**: The contents of the **UNIT LABEL** should be always transmitted to the Svantek's service in the case of any problems faced by the user during the instrument's operation.*

7 SAVING THE MEASUREMENT RESULTS - FILE

The registration of the measurement results is an essential task for the efficient use of the instrument. All available measurement results can be stored in the FLASH type memory of the instrument or on the USB memory stick.

There are two main ways for storing the measurement data in the instrument:

1. **Save files containing the main results and setup settings using the FILE list.**
2. **Save data in the logger's file.**

Notice: The instrument's logger memory is independent from the results and setup memory. *The capacity of the available memory is equal to 32 MB and is divided between logger (16 252 428 bytes) and results and setup settings (15 859 224 bytes).*

Notice: *All of the options (except **DEFRAGMENTATION**) from the **FILE** list can be used for the USB memory stick.*

Saving files

In the case of the SVAN 956 instrument there are files containing data:

- from **V**ibration **LEVEL METER**;
- from **1/1 OCTAVE** analysis;
- from **1/3 OCTAVE** mode;
- from **FFT** analysis;
- from **ENVELOPING** mode;
- stored in the instrument's logger (accessible in the **DISPLAY** / **LOGGER VIEW** window).

Notice: The logger files are created automatically *(the usage of the **SAVE** is not required).*

Each file consists of some elements, which are the same for all kind of files:

- a file header;
- the unit and software specification;
- the user's text stored together with the measurement data;
- the parameters and global settings;
- the special settings for profiles;
- the marker of the end of the file.

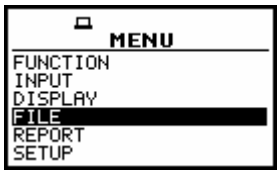
The other elements of the file structure depend on the type of the file (**VLM**, **1/1 OCTAVE**, **1/3 OCTAVE**, **FFT**, **ENVELOPING**, logger). These elements are as follows:

- the main results;
- the results coming from **1/1 OCTAVE** analysis;
- the results coming from **1/3 OCTAVE** analysis;
- the header of the **FFT** analysis performed in the selected band;
- the **FFT** analysis results;
- the results coming from **ENVELOPING** mode;
- the header of the file from the logger;
- the data stored during the measurements in the logger's file.

Notice: *The detailed description of all types of file structures is given in the Appendix B.*

Storing the vibration measurement results as files in the instrument's FLASH DISC can be done by means of the **FILE** list. In order to open, the **FILE** list the user has to:

- press the **<MENU>** push-button,
- select from the main list, using the **<▲>**, **<▼>** (or **<◀>**, **<▶>**) push-buttons, the **FILE** text (highlight it inversely),
- press the **<ENTER>** push-button.

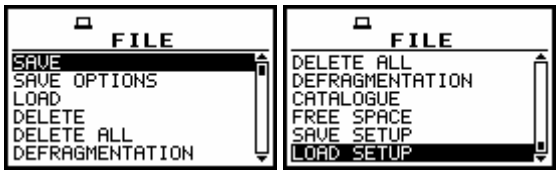


Main list; the FILE text highlighted (displayed inversely)

The **FILE** list contains the following items:

SAVE	enables one to save the measurement results as a file in the instrument's memory;
SAVE OPTIONS	enables one to set the options of the measurement result savings;
LOAD	enables one to load to the working space of the instrument's memory the measurement results saved in a file;
DELETE	enables one to delete a selected file from the instrument's memory;
DELETE ALL	enables one to delete all files from the instrument's memory;
DEFRAGMENTATION	enables one to consolidate the flash memory after deleting some files from it;
CATALOGUE	enables one to overview the catalogue of the files saved in the instrument's memory;
FREE SPACE	informs the user about the capacity of the instrument's memory still available for storing the measurement results:
SAVE SETUP	enables one to save the setup as a file in the instrument memory;
LOAD SETUP	enables one to load to the working space of the instrument's memory the selected setup saved in a file;
DIRECTORY	this position appears only in case when external USB memory stick is connected to the instrument; it informs the user about connected memory stick, the free space on USB memory stick, number of directory, the number of files, enables also to edit the name of the directory;
COPY FILES TO USB	this position appears only in when the external USB memory stick is connected to the instrument; it enables to copy files from the internal memory of the instrument to the connected USB memory stick;
MOVE FILES TO USB	this position appears only in case when USB memory stick is connected to the instrument; it enables the user to move files from the internal memory of the instrument to the connected USB memory stick.

Pressing the **<SHIFT>** and **<▲>** (or **<SHIFT>** and **<◀>**) results in a movement to the first position of the opened list and pressing the **<SHIFT>** and **<▼>** (or **<SHIFT>** and **<▶>**) results in a movement to the last position of the opened list.

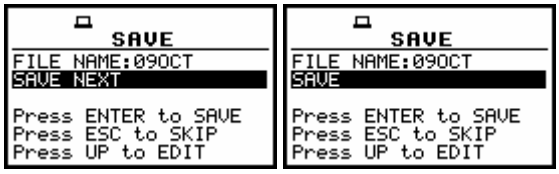


FILE list of the instrument

In each available position any change is performed by means of the **<◄>**, **<►>** push-buttons. In order to confirm the selection the **<ENTER>** push-button has to be pressed. After this confirmation, the opened window or list is closed. In order to ignore any changes made in the opened window or list the user has to press the **<ESC>** push-button.

7.1 Saving files in the instrument's memory - SAVE and SAVE NEXT

The **SAVE** is used for storing data in the internal non-volatile (FLASH DISC) memory (files are always written at the beginning of a free continuous space) as a file (see Appendix B for the file formats). In order to enter the window the user has to select the **SAVE** text in the **FILE** list, using the **<▲>** (or **<◄>**) push-button and press the **<ENTER>** push-button. There are two available functions: the **SAVE NEXT** – save a file with the name increased by one, and **SAVE** – save a file with the edited name. These functions are available after pressing the **<◄>**, **<►>** push-buttons.



SAVE window in the FILE list

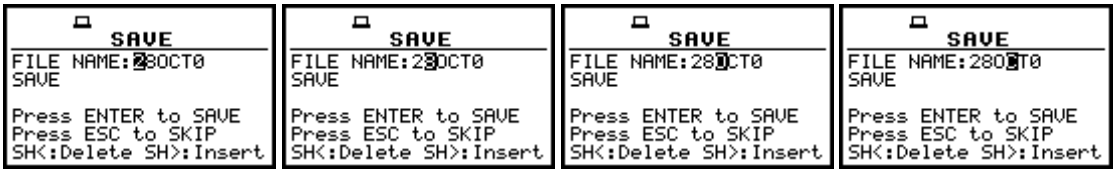
The name of the file, in which the measurements results are to be saved, is displayed above the **SAVE** or **SAVE NEXT** text. The default name for a file is displayed in the case of the first entering to this position (after power on). The default name consists of the day and the month's abbreviation. The line of the file's name edition (**FILE NAME**) is opened after pressing the **<▲>** push-button.

The user can skip the file's name edition and start saving file pressing the **<ENTER>** push-button or return to the **FILE** list pressing the **<ESC>** one.

The edition process is presented on the Figure below. The displayed inversely character is currently edited. The **<◄>**, **<►>**and **<◄>**, **<►>** pressed together with **<SHIFT>** push-buttons are used for editing the name which cannot exceed eight characters.

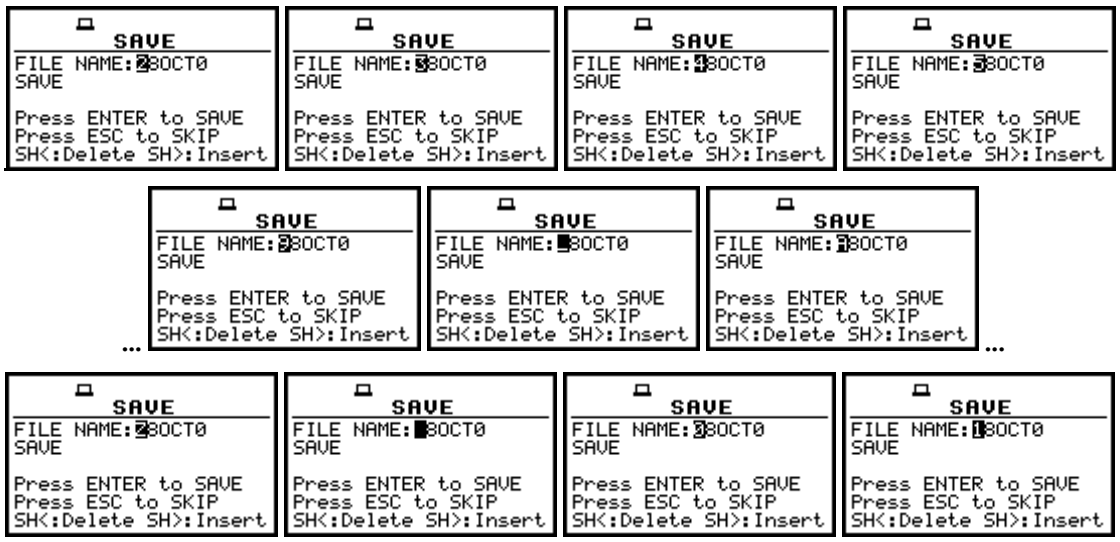
Display during the process of setting the character in the edited name

One can select the position of the character in the edited text using the **<◄>**, **<►>** push-buttons.

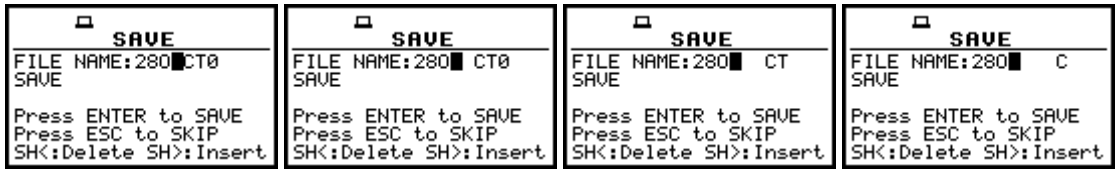


Display during the selection of the character's position to be edited

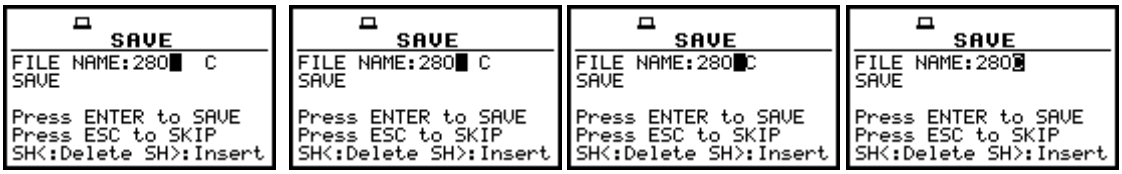
The available ASCII characters can be changed using the **<▲>** (or **<▼>**) push-button pressed together with the **<SHIFT>** one. The subsequent digits, underline, big letters and space appear on the display in the inversely displayed position after each pressing of the mentioned above push-buttons.



Display during the selection of the character



FILE NAME edition after pressing the <SHIFT> and <➤> push-buttons



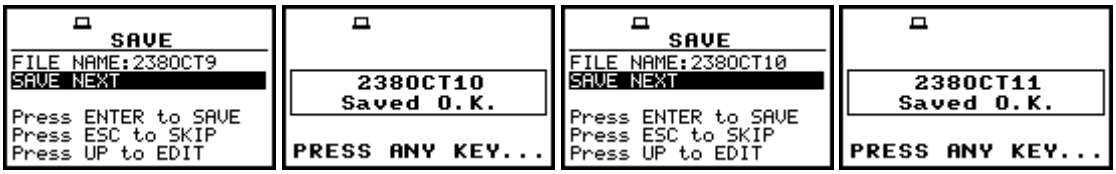
FILE NAME edition after pressing the <SHIFT> and <◄> push-buttons

The edited name is accepted and the file is saved after pressing the **<ENTER>** push-button. The special warning is displayed in the case the file with the edited name already exists in the memory. The instrument waits then for a reaction of the user (any push-button should be pressed except the **<SHIFT>** or the **<ALT>** one).

Displays during the attempt of overwriting the existing file, changing the name and saving data

All changes introduced to the file name during the edition are ignored after pressing the **<ESC>** push-button. This pressing causes the return to the list from which the **SAVE** option was entered. The return after the edition to the line with the **SAVE** or **SAVE NEXT** text is possible after pressing the **<⮟>** push-button.

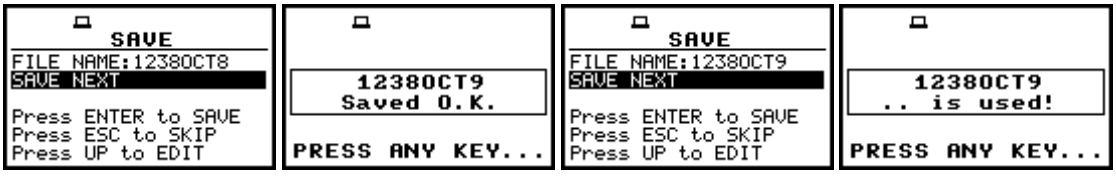
The simplified edition consists in the addition at the end of the file name the natural number. The increase by one of the number is made automatically. After the execution of the saving operation the new file name is displayed and the instrument waits then for a reaction of the user (any push-button should be pressed except the **<SHIFT>** or the **<ALT>** one). In the next attempt of saving data, the new name is displayed in the **FILE NAME** line and that name is increased by one during the saving operation.



Displays in the simplified edition of the file name and the execution of the saving operation

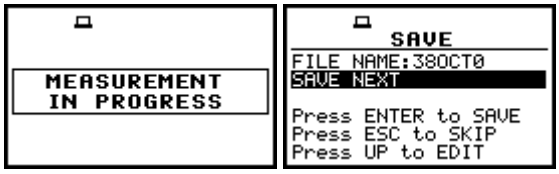
The number can be changed from 0 to N. The only limitation of the N value is the length of the file name, which cannot be longer than eight characters. In the case, when such limitation is achieved and the instrument can not change automatically the file's name the only possibility is to edit new file name.

Notice: *The files can be overwritten (the use of the same file name)* ***without any warning*** *if the* ***REPLACE*** *option is switched on (path: MENU / FILE / SAVE OPTIONS / REPLACE).*



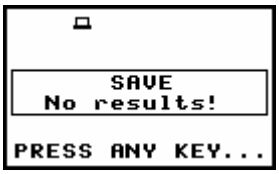
Displays in the simplified edition of the file name, saving and the "saturation" of that operation

As it was already written, the instrument attempts to save a file after pressing the **<ENTER>** push-button. The saving is not possible in the case when the instrument is measuring the signal. The special message is displayed for about 3 seconds in this case and the instrument returns to the **SAVE** window.



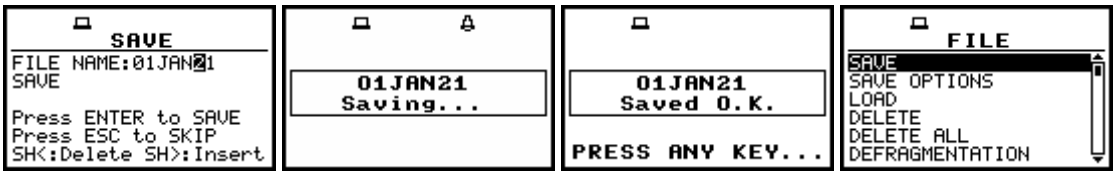
Displays after the attempt to perform unavailable saving operation and the return to the SAVE NEXT

The presented below message is displayed after trying to execute the save operation in the case when no measurements were performed and there are no results to be saved. The instrument then waits for the reaction of the user (any push-button should be pressed except the **<SHIFT>** or the **<ALT>** one) and after pressing a push-button it returns to the **SAVE** window.



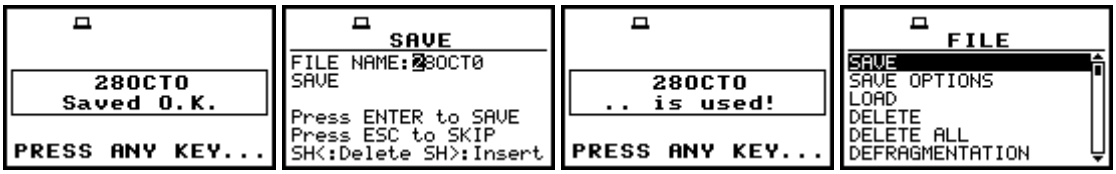
Display after the SAVE operation when there were no results for storing

Notice: *During the execution of the **SAVE** or **SAVE NEXT** function an additional window is displayed informing about the operation performed. In the case of short files, this window can be unnoticed by the user.*



View of all displays during and after the execution of the SAVE operation

As it was already written, it is not possible to store the data in the file, which already exists, when the **REPLACE** is not active (**[ ]**) (*path: MENU / FILE / SAVE OPTIONS / REPLACE*). The presented below sequence of displays illustrates the situation when during the name edition process the user selected the name, which was used before. The instrument displays a special message and waits for the reaction of the user (any push-button should be pressed except the **<SHIFT>** or the **<ALT>** one) and after pressing a push-button it returns to the **FILE** list.



Displays after the attempt to overwrite a file if the REPLACE is not active

Notice: *The direct access to the **SAVE** / **SAVE NEXT** function is possible after pressing simultaneously the **<ENTER>** and **<ALT>** push-buttons if the **DIRECT SAVE** option is switched off (path: MENU / FILE / SAVE OPTIONS / DIRECT SAVE). In another case, (**DIRECT SAVE** option is switched on) the results are saved, after pressing these push-buttons, in the file with the automatically incremented name.*

Notice: *After the usage of the **<ENTER>** and **<ALT>** push-buttons (if the **DIRECT SAVE** option is switched on) the measurement results are saved only once. The following pressing will not cause any instrument's reaction unless next measurement is performed. The same result can be saved in the multiply number of files only using the **SAVE** / **SAVE NEXT** function.*

7.2 Controlling the data storing in the instrument's memory - SAVE OPTIONS

The **SAVE OPTIONS** sub-list is used for the selection of the options of data storing in the **FLASH DISC** memory of the instrument. The sub-list is opened after pressing the **<ENTER>** push-button when the **SAVE OPTIONS** text in the **FILE** list is displayed inversely (selected using the **<▲>**, **<▼>** (or **<◀>**, **<▶>**) push-buttons). The return to the **FILE** list is possible after pressing the **<ESC>** push-button.

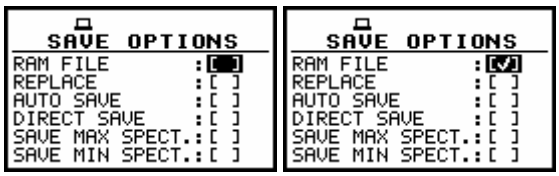
FILE list with the SAVE OPTIONS text highlighted (displayed inversely)

It is possible to write data into the same part of the memory starting all the time with the same address (**RAM FILE**), to replace the existing in the memory file by the new with the same name (**REPLACE**), to save automatically the results of the measurements (**AUTO SAVE**), to save the results of measurements directly (**DIRECT SAVE),** to save maxima/ minima from the spectrum (**SAVE MAX SPECT**., **SAVE MIN SPECT**.) . The position of the sub-list is changed after pressing the **<▲>**, **<▼>** push-buttons. In order to confirm the selection the **<ENTER>** push-button has to be pressed. Such pressing closes also the opened sub-list.

7.2.1 Saving data starting from the same address - RAM FILE

The measurement data usually are saved in the different files in the flash memory of the instrument. There is also possibility to save data in RAM file starting from the same address. It means that each time the data are saved the previous file is overwritten. This option is useful for the permanent monitoring and remote reading data from the instrument by means of any available interface with the proper period. In order to read data saved in a RAM file one has to use **#4,3** function described in details in App. A.

The **RAM FILE** is switched on after placing the special character (**[√]**) in the inversely displayed position in the line with the **RAM FILE** text. The activation or deactivation of the **RAM FILE** is done by pressing the **<◀>**, **<▶>** push-buttons.



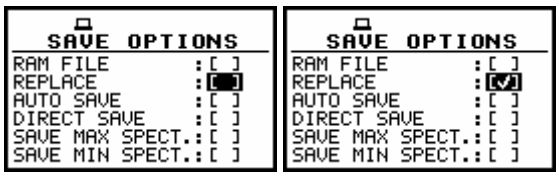
SAVE OPTIONS sub-list; the selection of the RAM FILE

After pressing the **<ENTER>** push-button the selections made in any position of the sub-list (in particular also in the **RAM FILE**) are confirmed and the sub-list is closed. In the case when the **AUTO SAVE** was active (**[√]**), after pressing the **<ENTER>** push-button the **FILE NAME** window is opened for editing the names for the **AUTO SAVE** files. The **SAVE OPTION** is closed ignoring all settings made in it after pressing the **<ESC>** push-button.

The **RAM FILE** functionality is available only in the **LEVEL METER**, **1/1 OCTAVE** and **1/3 OCTAVE** mode. In the **FFT** and **ENVELOPING** modes the line with the **RAM FILE** text does not appear on the display after entering the **SAVE OPTIONS** sub-list.

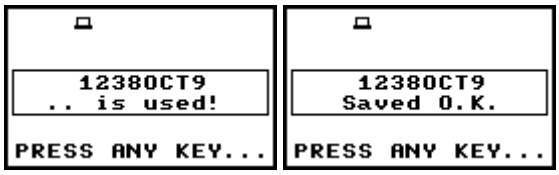
7.2.2 Replacement of the existing files by the new ones - REPLACE

The result of the attempt to save the file with the name, which already exists in the memory, depends on the setting of the **REPLACE**. It is possible to erase the old file and to save the new one with the same name if the position is active (**[√]**). The activation or deactivation of the **REPLACE** is done by pressing the **<◄>**, **<►>** push-buttons.



SAVE OPTIONS sub-list; the selection of the REPLACE

The message is displayed that such operation is not available in the case when this position is not active (**[ ]**) – cf. the description of the **SAVE**. In the other case, the existing file is overwritten.

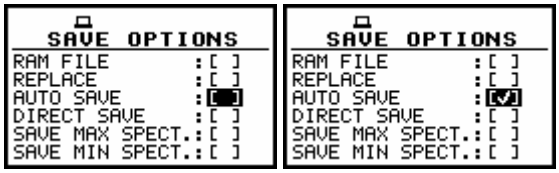


Displays during the file saving when the REPLACE is switched off and on

After pressing the **<ENTER>** push-button the selections made in any position of the sub-list (in particular also in the **REPLACE**) are confirmed and the sub-list is closed. In the case when the **AUTO SAVE** was active (**[√]**), after pressing the **<ENTER>** push-button the **FILE NAME** window is opened for editing the names for the **AUTO SAVE** files. The **SAVE OPTION** sub-list is closed ignoring all settings made in it after pressing the **<ESC>** push-button.

7.2.3 Controlling the measurement results savings - AUTO SAVE

Using the **AUTO SAVE** one can set the self-saving of the measurement results (**[√]**) or to switch off (**[ ]**) this possibility. The activation or deactivation of the **AUTO SAVE** is done by pressing the **<◄>**, **<►>** push-buttons. This position was also established in order not to waste too much memory of the instruments when the self-saving is not necessary.



SAVE OPTIONS sub-list; the selection of the AUTO SAVE

Notice: The **AUTO SAVE** function can be performed only in the case when the **INTEGR. PERIOD** (path: MENU / INPUT / MEASUREMENT SETUP) is not less than 10 seconds. If it is less than 10 seconds, the measurement results are not saved without any indication of that fact! There is only one exception - when the **REP. CYCLE** (path: MENU / INPUT / MEASUREMENT SETUP) is equal to one, the **AUTO SAVE** function is executed disregarding the value of the integration period.

The **FILE NAME** window is opened after switching on the **AUTO SAVE** function and pressing the **<ENTER>** push-button. After pressing the **<ESC>** push-button the **FILE NAME** window is closed and the instrument returns to the **SAVE OPTION**, but with the **AUTO SAVE** function switched off.

Displays during the execution of the AUTO SAVE switching on; the FILE NAME skipping and return to the SAVE OPTION sub-list

When the integration period is too short for switching on the **AUTO SAVE** option the following message appears on the display:

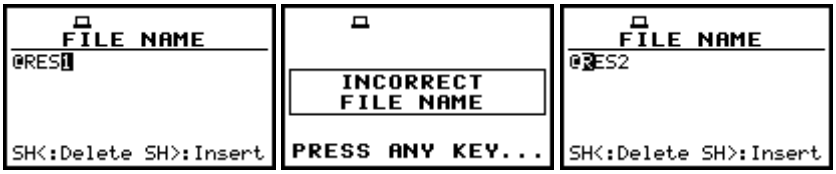
Display after attempt of switching on AUTO SAVE option with too short INT. PERIOD

The **FILE NAME** window is closed after pressing the **<ENTER>** push-button with the confirmation of the **AUTO SAVE** function switched on and the user interface returns to the **FILE** list.

Displays during the execution of the AUTO SAVE switching on; the FILE NAME confirmation and return to the FILE list

The edition of the file name in the **FILE NAME** window is performed almost in the same way as it was described in the case of the **SAVE** / **SAVE NEXT** function. The displayed inversely character is currently edited. The **<◀>**, **<▶>**, **<◀>**, **<▶>** and **<SHIFT>** push-buttons are used for editing the name which cannot exceed eight characters including the starting special character @ which cannot be edited. One can select the proper position of the character in the edited text using the **<◀>**, **<▶>** push-buttons. The available ASCII characters can be changed using the **<▲>** (or **<▼>)** push-button pressed together with the **<SHIFT>** one. Additionally, the character can be also changed using the **<▲>** (or **<▼>**) push-button (this functionality is not available in the **SAVE** / **SAVE NEXT** function). The subsequent digits, underline, big letters and space appear on the display in the inversely displayed position after each pressing of the mentioned above push-buttons.

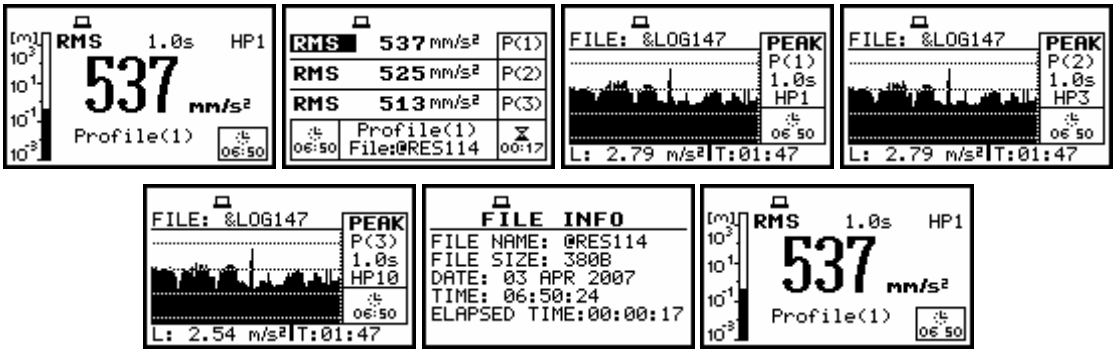
The edition is finished after pressing the **<ENTER>** push-button. The edited name is compared with the file names existing in the catalogue. In the case when the file with the same name already exists, the special message is displayed and after pressing any character except the **<SHIFT>** or **<ALT>** one, the instrument returns once more to the **FILE NAME** window.



Displays after the incorrect file name edition

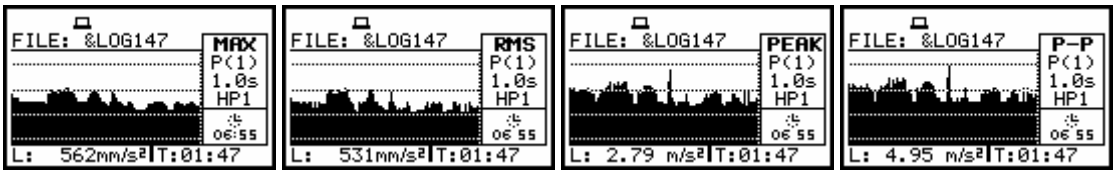
When the **AUTO SAVE** option is active (**[√]**), after starting the measurements by pressing the **<START/STOP>** push-button the results are saved in the file with the selected name. Depending on

the instrument's mode and selected options the sequence of the displays available after each pressing of the **<▲>** or **<▼>** could be as presented below.



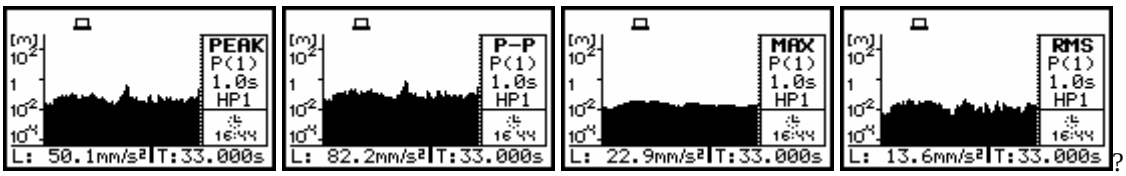
Measurement results presented after pressing the <▲> or <▼> push-buttons

In the case when from a profile more than one result was saved in the logger's file, the other results are presented after pressing the **<◄>**, **<►>** push-buttons together with the **<ALT>** one.



Results saved from a profile presented after pressing the <◄> or <►> and <ALT> push-buttons

After pressing the **<▲>** or **<▼>** and **<ALT>** push-buttons the **VIEW** is changed (*path: MENU / DISPLAY / DISPLAY SETUP / LOGGER VIEW / VIEW*). So, after pressing these push-buttons and then repeating the previous sequence (the **<◄>**, **<►>** push-buttons together with the **<ALT>** one) the user can observe the displays presented below.

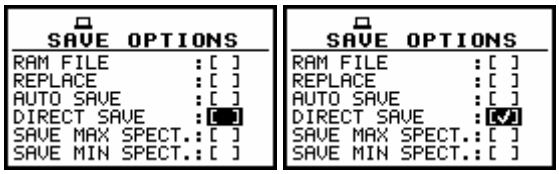


Results saved from a profile presented after pressing the <◄> or <►> and <ALT> push-buttons

Another measurement is started after next pressing of the **<START/STOP>** push-button. The measurement is stopped after the selected **INTEGR. PERIOD** (*path: MENU / INPUT / MEASUREMENT SETUP / INTEGR. PERIOD*) names of the next saved files are automatically incremented by one. The same remarks are valid in this case as it was already stated in the description of the **SAVE NEXT** function.

7.2.4 Direct access to the SAVE / SAVE NEXT function - DIRECT SAVE

The **DIRECT SAVE** enables one to select the instrument's reaction on the simultaneous pressing of the **<ENTER>** and **<ALT>** push-buttons. If this option is not active (**[ ]**), after pressing these push-buttons the **SAVE** window is accessed (if the measurements are not performed). If the option is active (**[√]**), after pressing the **<ENTER>** and **<ALT>** push-buttons the results are saved in the file with the automatically incremented name and the proper message is displayed for a few seconds. The proper setting of the **DIRECT SAVE** is done by pressing the **<◄>**, **<►>** push-buttons.



SAVE OPTIONS sub-list; the selection of the DIRECT SAVE

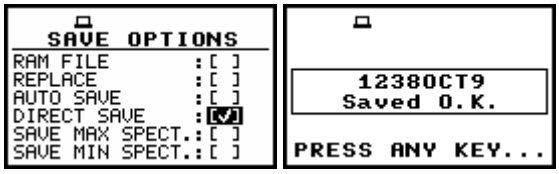
After pressing the **<ENTER>** push-button the selections made in any position of the sub-list (in particular also in the **DIRECT SAVE**) are confirmed and the sub-list is closed. In the case when the **AUTO SAVE** was active (**[√]**), after pressing the **<ENTER>** push-button the **FILE NAME** window is opened for editing the names for the **AUTO SAVE** files. The **SAVE OPTION** sub-list is closed ignoring all settings made in it after pressing the **<ESC>** push-button.

During the execution of the measurements pressing the **<ENTER>** and **<ALT>** push-buttons causes, disregarding the option set in the **DIRECT SAVE**, that the message presented below is displayed.

Display after the attempt to perform an unavailable operation during measurement in progress

The presented below displays illustrates the difference in the user interface execution after pressing the **<ENTER>** and **<ALT>** push-buttons in the case when the measurements are not performed and the **DIRECT SAVE** is not active (**[ ]**) and active (**[√]**).

Exemplary executions of the software with the DIRECT SAVE not active

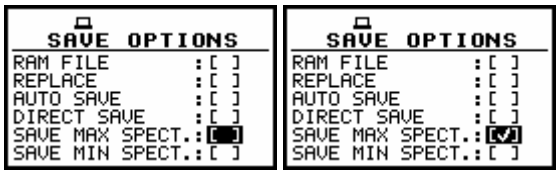


Exemplary executions of the software with the DIRECT SAVE active

7.2.5 Saving maximum values in the spectrum - SAVE MAX SPECT.

The **SAVE MAX SPECT.** enables the user to save the highest values of the **INSTANTENEOUS** spectra (calculated with 100-milliseconds time step) in **1/1 OCTAVE** or **1/3 OCTAVE** analysis, which occured during the **INTEGR. PERIOD** set in the **INPUT** list (*path: MENU / INPUT / MEASUREMENT SETUP / INTEGR. PERIOD*).

The activation or deactivation of the **SAVE MAX SPECT.** is done by pressing the **<◄>**, **<►>** push-buttons. After pressing the **<ENTER>** push-button the activation is confirmed. The **SAVE OPTION** sub-list is closed ignoring all settings made in it after pressing the **<ESC>** push-button.



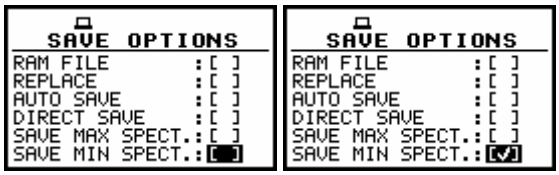
SAVE OPTIONS sub-list; the selection of the SAVE MAX SPECT.

To see the **MAX** values on the display during the the real time **1/1 OCTAVE** or **1/3 OCTAVE** analysis measurement the user has to activate the option in the **DISPLAY** list (*path: MENU / DISPLAY / DISPLAY SETUP / SPECTRUM VIEW / MAX or path: MENU / DISPLAY / DISPLAY MODES / SPECTRUM*).

7.2.6 Saving the lowest values in the spectrum - SAVE MIN SPECT.

The **SAVE MIN SPECT.** enables the user to save the lowest values of the **INSTANTANEOUS** spectra (calculated with 100-milliseconds time step) in **1/1 OCTAVE** or **1/3 OCTAVE** analysis, which occured during the **INTEGR. PERIOD** set in the **INPUT** list (*path: MENU / INPUT / MEASUREMENT SETUP / INTEGR. PERIOD*).

The activation or deactivation of the **SAVE MIN SPECT.** is done by pressing the **<◄>**, **<►>** push-buttons. After pressing the **<ENTER>** push-button the activation is confirmed. The **SAVE OPTION** sub-list is closed ignoring all settings made in it after pressing the **<ESC>** push-button.

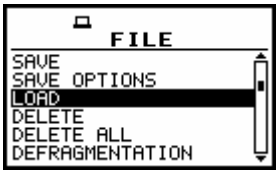


SAVE OPTIONS sub-list; the selection of the SAVE MIN SPECT.

To see the **MIN** values on the display during the real time **1/1 OCTAVE** or **1/3 OCTAVE** analysis the user has to activate the option in the **DISPLAY** list (*path: MENU / DISPLAY / DISPLAY SETUP / SPECTRUM VIEW / MIN with active SPECTRUM mode or path: MENU / DISPLAY / DISPLAY MODES / SPECTRUM*).

7.3 Loading the files with the measurement results - LOAD

The **LOAD** is used for loading data file from the FLASH DISC (e.g. for the verification or comparison). The position is opened after pressing the **<ENTER>** push-button when the **LOAD** text in the **FILE** list is displayed inversely (selected using the **<▲>**, **<▼>** (or **<◄>**, **<►>**) push-buttons). The return to the **FILE** list is possible after pressing the **<ESC>** push-button.



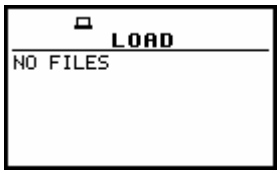
FILE list with the LOAD text highlighted (displayed inversely)

Notice: It is not possible to load the file during the execution of the measurements. *On such attempt the message:* ***MEASUREMENT IN PROGRESS*** *is displayed for about 3 seconds.*

After pressing the **<ENTER>** push-button the instrument checks its current state. In the case when the measurements are performed, the file loading is impossible and the message is displayed.

Display after the attempt to perform an unavailable operation during measurement in progress

In the case when the instrument memory is empty (no file is stored), after entering the **LOAD** window the **NO FILES** text is displayed and the instrument waits for the reaction of the user. The user should press then the **<ESC>**, **<ENTER>** (the instrument returns to the **FILE** list) or **<START / STOP>** push-button (the instrument starts the measurement).

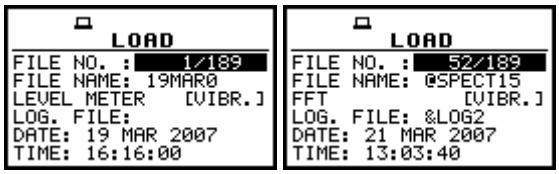


Display during the execution of the LOAD operation

The current number of the file and the total number of the saved files is displayed in the first line of the **LOAD** window. The name of the file is displayed in the second line (its current number is presented in the first line). The name of the file suggests the operation the file was created-in. The names in which the first character is @ are coming from the **AUTO SAVE** function. The file with the default name @Timer@ is coming from the **AUTO SAVE** function executed in the **TIMER** operation. The other names suggest the **SAVE** / **SAVE NEXT** function. The type of the current file (**LEVEL METER**, **1/1 OCTAVE**, **1/3 OCTAVE**, **FFT** or **ENVELOPING**) and the mode **([VIBR.]**) are given in the third line. If during the measurements which results are saved in the file, the logger file was also created its name is displayed in the fourth line.

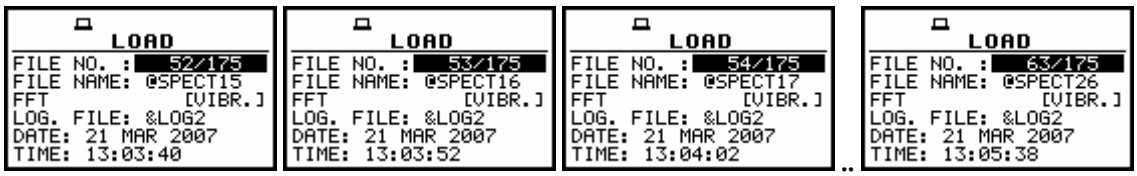
Notice: *The logger file can be deleted from the instrument's memory in the* ***FILE*** */* ***DELETE*** */* ***LOGGER FILES*** *window and this deleting operation does not modify the contents of the fourth line of the* ***LOAD*** *window.*

The date and time of the **SAVE** operation are displayed in the fifth and sixth line, respectively. The change of the current file with the unit step can be done after pressing the **<🡄>**, **<🡆>** push-buttons. The first file is available after pressing the **<🡄>** with **<SHIFT>** push-button (or **<🡇>** with **<SHIFT>**) and the last one is displayed after pressing the **<🡆>** with **<SHIFT>** push-button (or **<🡅>** with **<SHIFT>**).



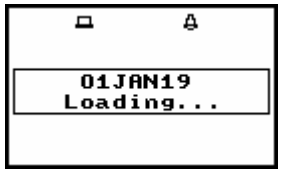
Exemplary contents of the LOAD window

Notice: *Many result files can be associated with one logger file, i.e. during the execution of the* ***AUTO SAVE*** *function.*



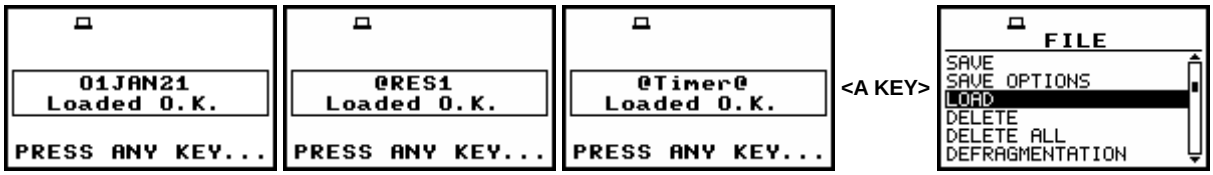
Exemplary result files associated with the same logger file (&LOG2)

The name of the file is accepted and the file is loaded after pressing the **<ENTER>** push-button. The message with the name of the selected file is displayed during the execution of the loading operation.



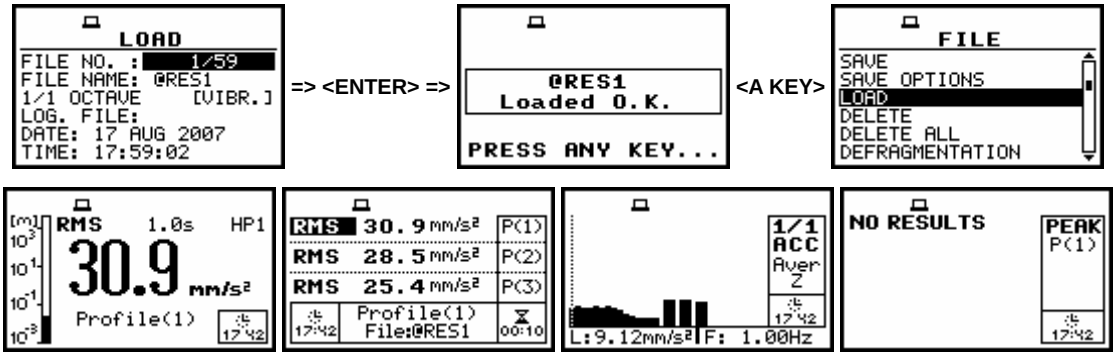
Display during the execution of the loading function

The next message is displayed after successful end of loading operation. The instrument waits for the reaction of the user (any push-button should be pressed except the **<SHIFT>** or **<ALT>** one) and after pressing a push-button it returns to the **FILE** list.



Displays after the execution of the LOAD operation

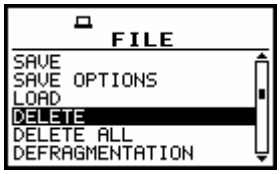
The contents of the loaded file is displayed in the available result presentation modes (after pressing the **<▲>**, **<▼>** push-buttons) depending on the current settings of the instrument.



Exemplary displays during the loading and checking the contents of a 1/1 OCTAVE file

7.4 Removing a file with the measurement results from memory – DELETE

The **DELETE** is used to remove a file from memory. In order to enter the window the user has to select the **DELETE** text (to display it inversely) using the **<▲>**, **<▼>** push-buttons and then press the **<ENTER>** one.



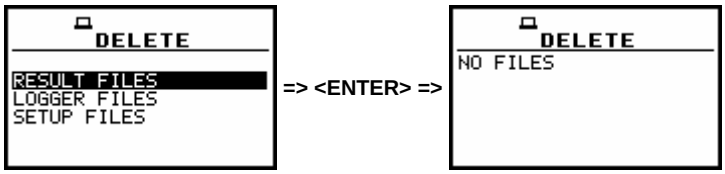
FILE list with the DELETE text highlighted (displayed inversely)

In the **DELETE** window, there are three elements: **RESULT FILES**, **LOGGER FILES** and **SETUP FILES**. In order to enter the selected sub-list the user has to select the proper text (to display it inversely) using the **<▲>**, **<▼>** (or **<◀>**, **<▶>**) push-buttons and then press the **<ENTER>** one. The **DELETE** window is closed and the instrument returns to the **FILE** list after pressing the **<ESC>** one.

7.4.1 Deleting files with the main results - RESULT FILES

In order to enter the window one has to press the **<ENTER>** push-button on the inversely displayed **RESULT FILES** text of the **DELETE** sub-list using the **<▲>**, **<◀>**, **<▲>** with **<SHIFT>** or **<◀>** with **<SHIFT>** push-buttons. The **DELETE** sub-list is closed and the instrument returns to the **FILE** list after pressing the **<ESC>** push-button.

In order to enter the list of the saved result files in the flash memory one has to press the **<ENTER>** push-button. In the case when the result files were not saved in the memory, the special message is displayed and the instrument waits for the reaction of the user. The user should press any push-button except the **<SHIFT>** and **<ALT>**.



RESULT FILES selected to be deleted and the flash memory does not contain any file

After pressing the **<ENTER>** push-button the instrument checks its current state. In the case when the measurements are performed, the **RESULT FILES** entering is impossible. In such case, the message is displayed and the instrument returns after few seconds to the **DELETE** sub-list.

Display after the attempt to perform an unavailable operation during measurement in progress

The same data about the existing in the instrument files as in the **FILE / LOAD** window are displayed after successful opening the **FILE / DELETE / RESULT FILES** one (pressing the **<ENTER>** push-button).

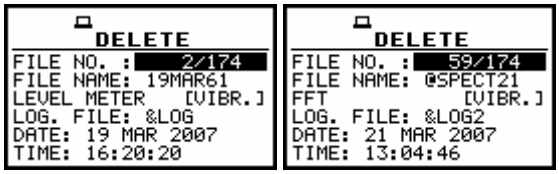
The current number of the file and the total number of the saved files is displayed in the first line of the window.

The name of the file is displayed in the second line (its current number is presented in the first line).

The name of the file suggests the operation the file was created-in. The names in which the first character is @ are coming from the **AUTO SAVE** function. The file with the default name @Timer@ is coming from the **AUTO SAVE** function executed in the **TIMER** operation. The other names suggest the **SAVE** / **SAVE NEXT** function. The type of the current file **LEVEL METER**, **1/1 OCTAVE**, **1/3 OCTAVE**, **FFT** or **ENVELOPING**) and the mode (**[VIBR.]**) is given in the third line. If during the measurements which results are saved in the file, the logger file was also created its name is displayed in the fourth line.

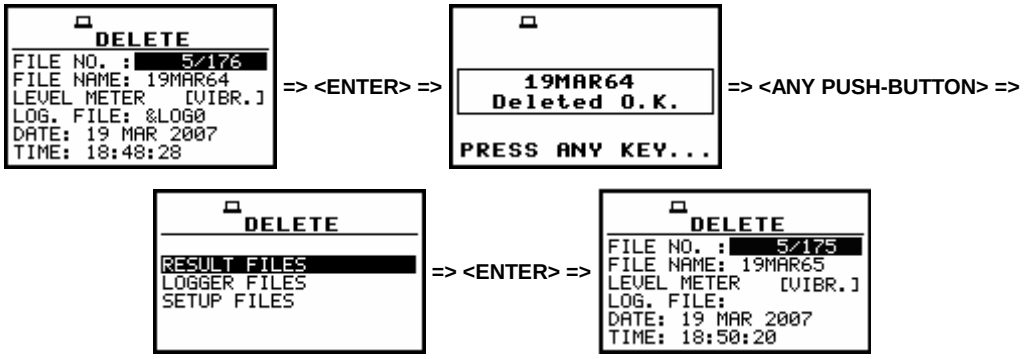
Notice: *The logger file can be deleted from the instrument's memory in the* ***FILE*** */* ***DELETE*** */* ***LOGGER FILES*** *window and this deleting operation does not modify the contents of the fourth line of the* ***DELETE*** *window.*

The **DATE** and **TIME** of the **SAVE** operation are displayed in the fifth and sixth line, respectively. The change of the current file with the unit step can be done after pressing the **<🡄>**, **<🡆>** push-buttons. The first file is available after pressing the **<🡄>** with **<SHIFT>** push-button (or **<🡇>** with **<SHIFT>**) and the last one is displayed after pressing the **<🡆>** with **<SHIFT>** push-button (or **<🡅>** with **<SHIFT>**).



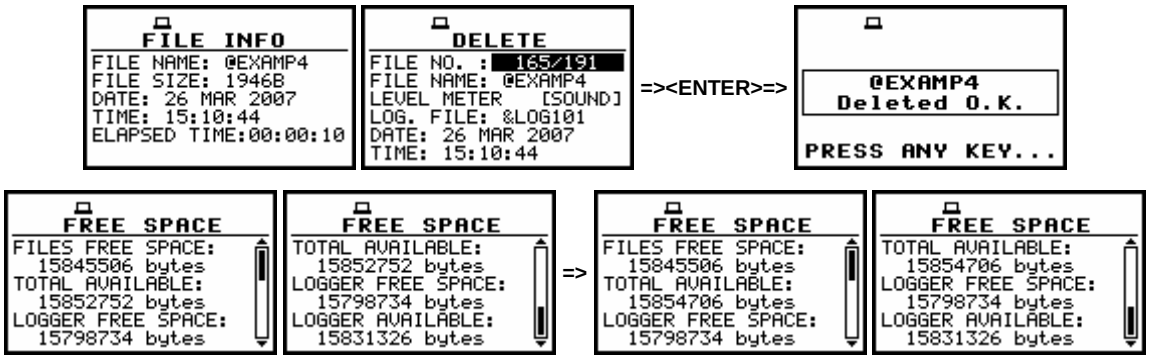
Selection of the RESULT FILES to be deleted

The selected file is deleted after pressing the **<ENTER>** push-button. The message is displayed after the successful end of the operation. The instrument waits for the reaction of the user (any push-button should be pressed except the **<SHIFT>** and **<ALT>** one) and after pressing a push-button it returns to the **DELETE** sub-list.



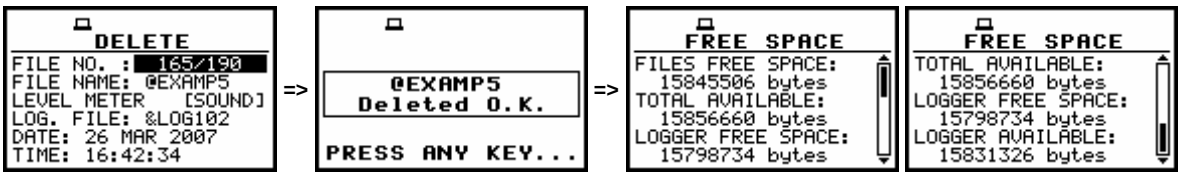
Execution of the RESULT FILES deletion

After the execution of the result files removing from the memory usually the **FREE SPACE** memory (*path: MENU / FILE / FREE SPACE*) rests the same as before the deletion but **TOTAL AVAILABLE** memory is increased. It is because erased file was somewhere in the file's space. The file is no longer accessible but the recuperated memory is still unused for the next saving. This memory becomes available after the defragmentation process (*path: MENU / FILE / DEFRAGMENTATION)* in which all files are moved to the continuous space. In order to illustrate it let us consider the result file named @EXAMP4, which is 1946 bytes long.



Execution of the @EXAMP4 file deletion and the influence of this process on the memory space

After removing @EXAMP4 from the memory, only the **TOTAL AVAILABLE** is increased (*path: MENU / FILE / FREE SPACE*).



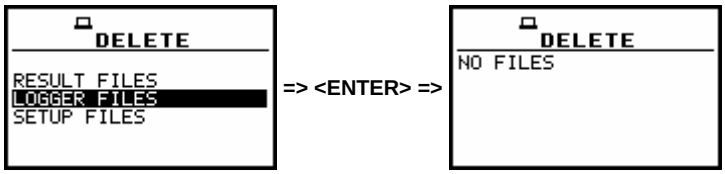
Execution of the @EXAMP5 file deletion and the influence of this process on the memory space

The displays above illustrates the erasing from the flash memory another file named @EXAMP5 which was also 1946 bytes long; the **FILES FREE SPACE**, **LOGGER FREE SPACE** and **LOGGER AVAILABLE** remain unchanged while the **TOTAL AVAILABLE** is increased.

7.4.2 Deleting logger files - LOGGER FILES

In order to enter the window one has to press the **<ENTER>** push-button on the inversely displayed **LOGGER FILES** text of the **DELETE** sub-list using the **<▲>**, **<◀>**, **<▲>** with **<SHIFT>** or **<◀>** with **<SHIFT>** push-buttons. The **DELETE** sub-list is closed and the instrument returns to the **FILE** list after pressing the **<ESC>** push-button.

In order to enter the list of the saved logger files in the memory one has to press the **<ENTER>** push-button. In the case when the logger files were not saved in the memory, the special message is displayed and the instrument waits for the reaction of the user. The user should press any push-button except the **<SHIFT>** and **<ALT>**.



LOGGER FILES selected to be deleted and the memory does not contain any file

After pressing the **<ENTER>** push-button the instrument checks its current state. In the case when the measurements are performed, the **LOGGER FILES** entering is impossible. In such case, the message is displayed and the instrument returns after few seconds to the **DELETE** sub-list.

Display after the attempt to perform an unavailable operation during measurement in progress

The similar data about the existing in the instrument logger files as in the **DISPLAY / LOGGER VIEW** window are displayed after successful opening the **FILE / DELETE / LOGGER FILES** one (pressing the **<ENTER>** push-button).

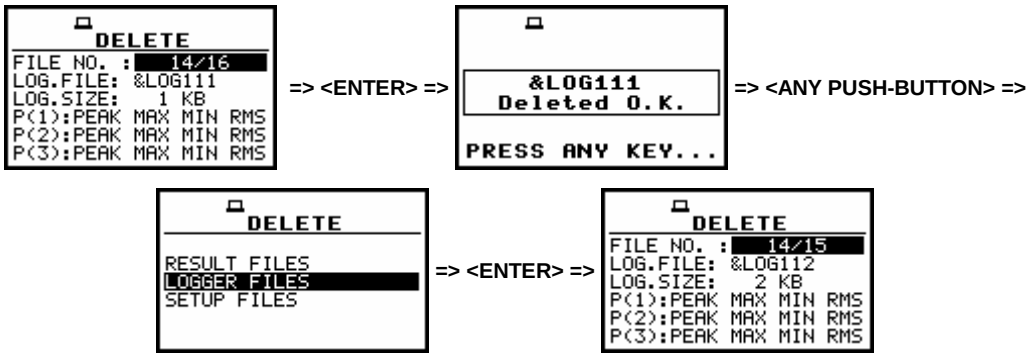
In the first line, the available still logger's memory is displayed followed by:

- The selected number of the logger's file and the number of all saved files (**FILE NO.:**).
- The name of the logger's file (**LOG.FILE:).**
- The size of the logger file which name is displayed in the previous line (**LOG.SIZE:**).
- The results saved (if any are present) in the logger from the first profile (**P(1):**).
- The results saved (if any are present) in the logger from the second profile (**P(2):**).
- The results saved (if any are present) in the logger from the third profile (**P(3):**).

The change of the current file with the unit step can be done after pressing the **<◄>**, **<►>** push-buttons. The first file is available after pressing the **<◄>** with **<SHIFT>** push-button (or **<▼>** with **<SHIFT>**) and the last one is displayed after pressing the **<►>** with **<SHIFT>** push-button (or **<▲>** with **<SHIFT>**).

Selection of the LOGGER FILES to be deleted

The selected file is deleted after pressing the **<ENTER>** push-button. The message is displayed after the successful end of the operation. The instrument waits for the reaction of the user (any push-button should be pressed except the **<SHIFT>** and **<ALT>** one) and after pressing a push-button it returns to the **DELETE** sub-list.

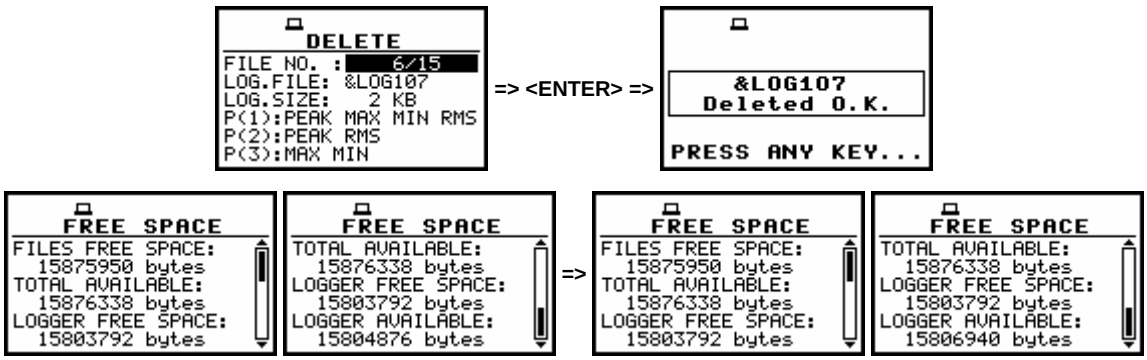


Execution of the LOGGER FILES deletion

After the execution of the logger files deletion from the memory, usually the logger free space rests the same as before the deletion but the total logger available memory is increased. It is because erased file was somewhere in the file's space. The file is no longer accessible but the recuperated memory is still unused for the next saving. This memory becomes available after the defragmentation process (*path:*

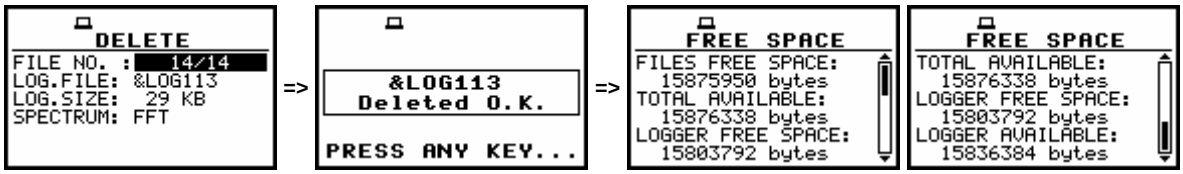
MENU / FILE / DEFRAGMENTATION / LOGGER DEFRAGMENT.) in which all files are moved to the continuous space.

It can be illustrated on the figures below by erasing from the memory 2 kB-long logger file named &LOG107. The presented there **FREE SPACE** window comes from the **FILE** list.



Execution of the &LOG107 file deletion from the logger memory and its influence on the memory space (LOGGER AVAILABLE)

The displays below illustrates the erasing from the logger memory another big file (29 kB) named &LOG113 just after the erasing of the file &LOG107 the **FILES FREE SPACE**, **TOTAL AVAILABLE** and **LOGGER FREE SPACE** remain unchanged while the **LOGGER AVAILABLE** is increased.

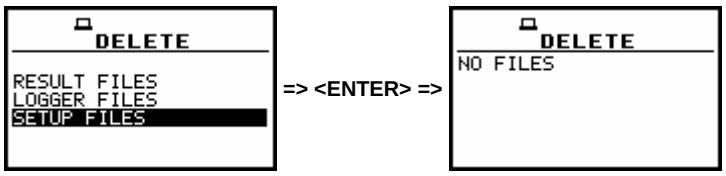


Execution of the &LOG113 file deletion and the influence of this process on the memory space

7.4.3 Deleting files with setup settings - SETUP FILES

In order to enter the window one has to press the **<ENTER>** push-button on the inversely displayed **SETUP FILES** text of the **DELETE** sub-list using the **<▼>**, **<➤>**, **<▼>** with **<SHIFT>** or **<➤>** with **<SHIFT>** push-buttons. The **DELETE** sub-list is closed and the instrument returns to the **FILE** list after pressing the **<ESC>** push-button.

In order to enter the list of the saved setup files in the memory one has to press the **<ENTER>** push-button. In the case when the setup files were not saved in the memory, the special message is displayed and the instrument waits for the reaction of the user. The user should press any push-button except the **<SHIFT>** and **<ALT>**.



SETUP FILES selected to be deleted and the instrument's memory does not contain any file

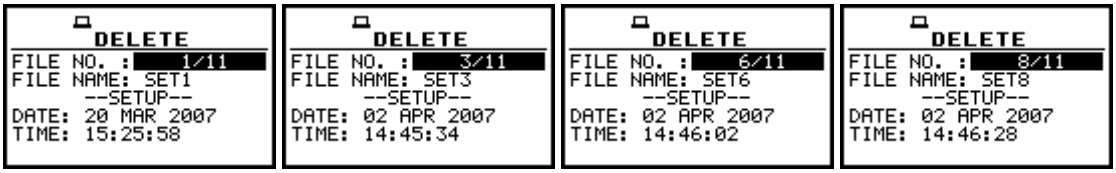
After pressing the **<ENTER>** push-button the instrument checks its current state. In the case when the measurements are performed, the **SETUP FILES** entering is impossible. In such case, the message is displayed and the instrument returns after few seconds to the **DELETE** sub-list.

Display after the attempt to perform an unavailable operation during measurement in progress

The data about the existing in the instrument setup files are displayed after successful opening the **FILE / DELETE / LOGGER FILES** window (pressing the **<ENTER>** push-button).

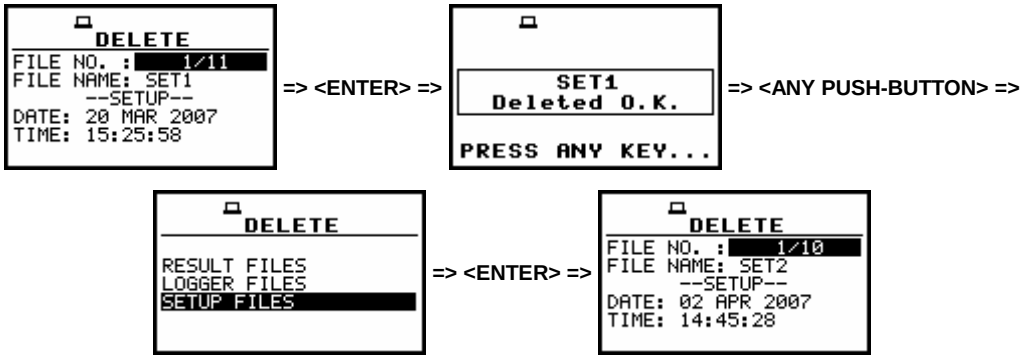
The current number of the file and the total number of the saved setup files is displayed in the first line of the window. The date and time of the **SAVE SETUP** operation is displayed in the last two lines respectively.

The change of the current file with the unit step can be done after pressing the **<◄>**, **<►>** push-buttons. The first file is available after pressing the **<◄>** with **<SHIFT>** push-button (or **<▼>** with **<SHIFT>**) and the last one is displayed after pressing the **<►>** with **<SHIFT>** push-button (or **<▲>** with **<SHIFT>**).



Selection of the SETUP FILES to be deleted

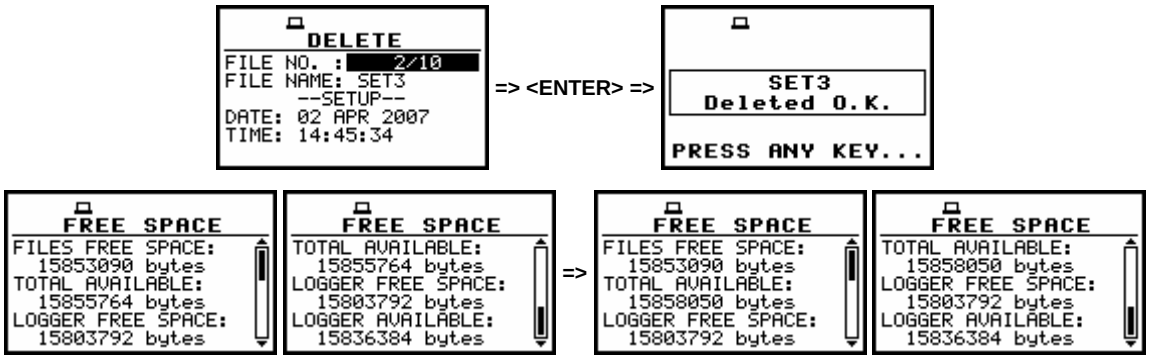
The selected file is deleted after pressing the **<ENTER>** push-button. The message is displayed after the successful end of the operation. The instrument waits for the reaction of the user (any push-button should be pressed except the **<SHIFT>** and **<ALT>** one) and after pressing a push-button it returns to the **DELETE** sub-list.



Execution of the RESULT FILES deletion

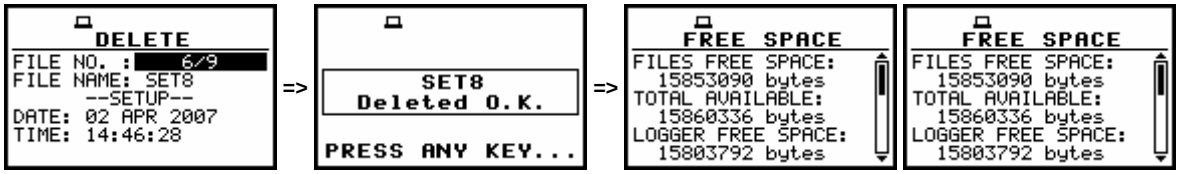
After the execution of the setup files removing from the memory usually the **FREE SPACE** memory (*path: MENU / FILE / FREE SPACE*) rests the same as before the deletion but **TOTAL AVAILABLE** memory is increased. It is because erased file was somewhere in the file's space. The file is no longer accessible but the recuperated memory is still unused for the next saving.

This memory becomes available after the defragmentation process (*path: MENU / FILE / DEFRAGMENTATION / FILES DEFRAGMENT*.) in which all files are moved to the continuous space. In order to illustrate it let us consider the removing from the memory the setup file named @SET3. After this, only the **TOTAL AVAILABLE** is increased (*path: MENU / FILE / FREE SPACE*).



Execution of the @SET3 file deletion and its influence on the memory space

The displays below illustrates the erasing from the flash memory another file named @SET8; the **FILES FREE SPACE**, **LOGGER FREE SPACE** and **LOGGER AVAILABLE** remain unchanged while the **TOTAL AVAILABLE** is increased.



Execution of the @SET8 file deletion and the influence of this process on the memory space

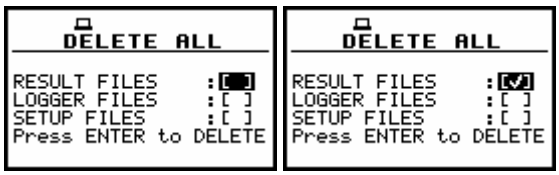
7.5 Removing all files with measurement results from memory - DELETE ALL

The **DELETE ALL** is used to remove all files from memory. In order to enter the position the user has to select the **DELETE ALL** text in the **FILE** list, using the **<▲>**, **<▼>** (or **<◄>**, **<►>**) push-buttons and press the **<ENTER>** one. The **DELETE ALL** sub-list consists of three positions: **RESULT FILES**, **LOGGER FILES** and **SETUP FILES**.

DELETE ALL text highlighted (displayed inversely) in the FILE list

7.5.1 Deleting all result files - RESULT FILES

In order to activate the position the user has to place the special character in the line with the **RESULT FILES** text using the **<►>** push-button. The **DELETE ALL** sub-list is closed and the instrument returns to the **FILE** list after pressing the **<ESC>** push-button. In order to enter the **DELETE ALL** window one has to press the **<ENTER>** push-button.

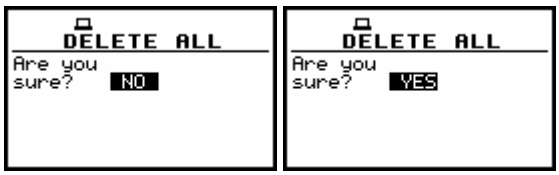


RESULT FILES selected to the execution of the DELETE ALL operation

After pressing the **<ENTER>** push-button the instrument checks its current state. In the case when the measurements are performed, the execution of the **DELETE ALL** operation is not possible. In such case, the message is displayed for a few seconds and the instruments returns to the **FILE** list.

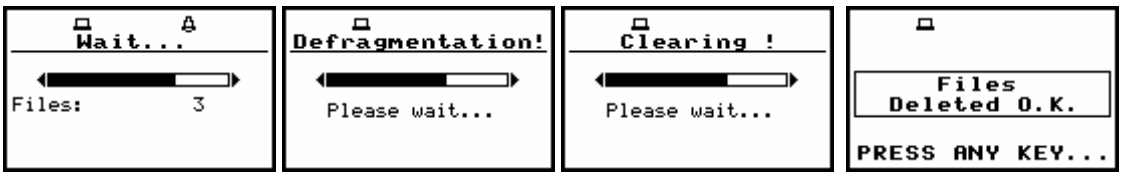
Display after the attempt to perform an unavailable operation during measurement in progress

If the measurements are not performed the instrument requests the confirmation of the operation after entering this window (after pressing the **<ENTER>** push-button). After next pressing the **<ENTER>** push-button, when the **NO** option is selected, the window is closed and the instrument returns to the **FILE** list. The selection of the **NO** or **YES** option is possible using the **<◄>**, **<►>** push-buttons. The return to the **FILE** list is also possible after pressing the **<ESC>** push-button.



Displays with the confirmation window during the execution of the DELETE ALL operation

All files from the selected type are deleted after the **<ENTER>** push-button pressing, when the **YES** option is selected. The message is displayed after the successful execution of all stages of the operation. The instrument waits for the reaction of the user (any push-button should be pressed except the **<SHIFT>** and **<ALT>** one) and after pressing a push-button it returns to the **FILE** list.

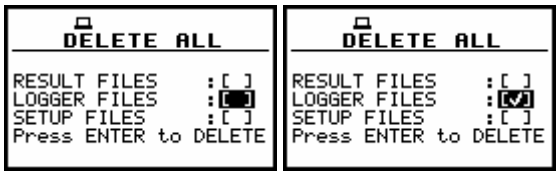


Execution of the DELETE ALL operation in the case of RESULT FILES selection

7.5.2 Deleting all logger files - LOGGER FILES

In order to activate the position the user has to place the special character in the line with the **LOGGER FILES** text using the **<►>** push-button. The **DELETE ALL** sub-list is closed and the instrument returns to the **FILE** list after pressing the **<ESC>** push-button.

In order to enter the **DELETE ALL** window one has to press the **<ENTER>** push-button.

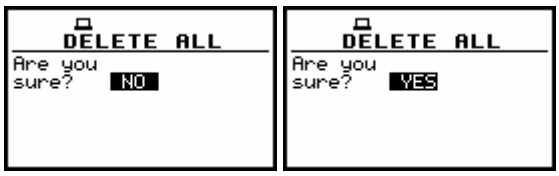


LOGGER FILES selected to the execution of the DELETE ALL operation

After pressing the **<ENTER>** push-button the instrument checks its current state. In the case when the measurements are performed, the execution of the **DELETE ALL** operation is not possible. In such case, the message is displayed for a few seconds and the instruments returns to the **FILE** list.

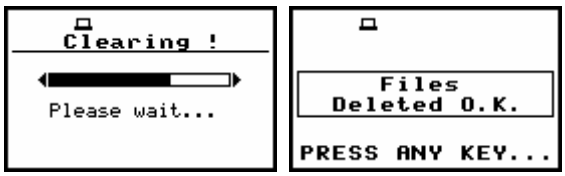
Display after the attempt to perform an unavailable operation during measurement in progress

If the measurements are not performed the instrument requests the confirmation of the operation after entering this window (after pressing the **<ENTER>** push-button). After next pressing the **<ENTER>** push-button, when the **NO** option is selected, the window is closed and the instrument returns to the **FILE** list. The selection of the **NO** or **YES** option is possible using the **<◄>**, **<►>** push-buttons. The return to the **FILE** list is also possible after pressing the **<ESC>** push-button.



Displays with the confirmation window during the execution of the DELETE ALL operation

All files from the selected type are deleted after the **<ENTER>** push-button pressing, when the **YES** option is selected. The message is displayed after the successful execution of all stages of the operation. The instrument waits for the reaction of the user (any push-button should be pressed except the **<SHIFT>** and **<ALT>** one) and after pressing a push-button it returns to the **FILE** list.

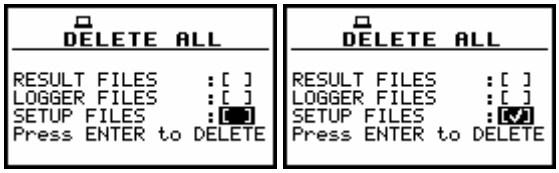


Execution of the DELETE ALL operation in the case of LOGGER FILES selected

7.5.3 Deleting all setup files - SETUP FILES

In order to activate the position the user has to place the special character in the line with the **SETUP FILES** text using the **<►>** push-button. The **DELETE ALL** sub-list is closed and the instrument returns to the **FILE** list after pressing the **<ESC>** push-button.

In order to enter the **DELETE ALL** window one has to press the **<ENTER>** push-button.

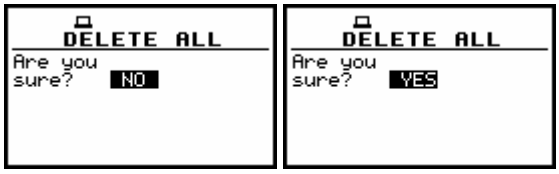


SETUP FILES selected to the execution of the DELETE ALL operation

After pressing the **<ENTER>** push-button the instrument checks its current state. In the case when the measurements are performed, the execution of the **DELETE ALL** operation is not possible. In such case, the message is displayed for a few seconds and the instruments returns to the **FILE** list.

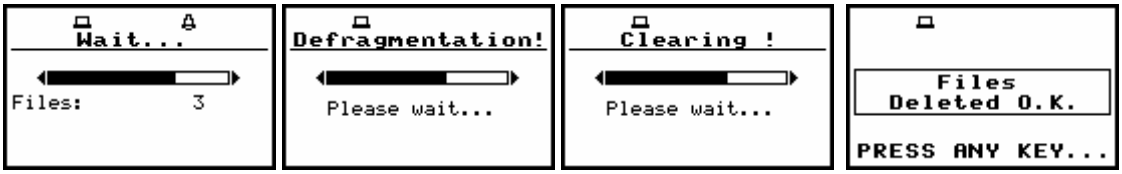
Display after the attempt to perform an unavailable operation during measurement in progress

If the measurements are not performed the instrument requests the confirmation of the operation after entering this window (after pressing the **<ENTER>** push-button). After next pressing the **<ENTER>** push-button, when the **NO** option is selected, the window is closed and the instrument returns to the **FILE** list. The selection of the **NO** or **YES** option is possible using the **<◄>**, **<►>** push-buttons. The return to the **FILE** list is also possible after pressing the **<ESC>** push-button.



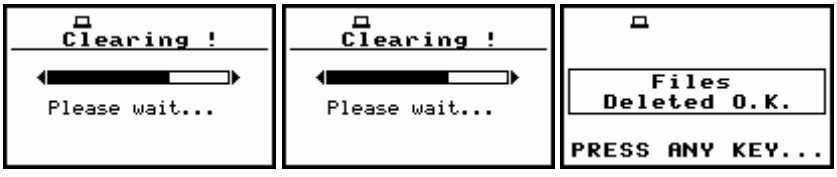
Displays with the confirmation window during the execution of the DELETE ALL operation

All files from the selected type are deleted after the **<ENTER>** push-button pressing, when the **YES** option is selected. The message is displayed after the successful execution of all stages of the operation. The instrument waits for the reaction of the user (any push-button should be pressed except the **<SHIFT>** and **<ALT>** one) and after pressing a push-button it returns to the **FILE** list.



Execution of the DELETE ALL operation in the case of SETUP FILES selection

Notice: *The execution of the **DELETE ALL** function described above takes place in the case when only one type of the files is selected in the **DELETE ALL** sub-list. If all types are selected simultaneously and the logger, result and setup are saved, only **Clearing** operation is performed but two times – one time in logger files memory and one time in result and setup files memory. After clearing all memory, the defragmentation is not done. The memory merging is done only in the case of setup and results memory, as these two different types of files are saved together in the same space.*



Execution of the DELETE ALL operation for all type files simultaneously

7.6 Merging file space - DEFRAGMENTATION

The **DEFRAGMENTATION** is used to make the file memory continuous. All new files are saved starting from the beginning of the free memory space. The memory occupied by the deleted file, assuming that the file was not the last one, remains unused for the next files saving. After the removing a file the files memory becomes discontinuous, with unused parts, which cannot be utilized in the future.

The situation changes after the process called defragmentation. During this process, the files saved in the files memory are moved in order to obtain the continuous occupied space. The files' merging is performed separately for two parts of the instrument's memory: the **FILES DEFRAGMENT.** is used to join the result and setup files and **LOGGER DEFRAGMENT.** is used in the case of the logger.

Before the defragmentation the **FILES FREE SPACE** and **TOTAL AVAILABLE**, characterizing the result memory (*path: MENU / FILE / FREE SPACE*), usually differ between each other. After this operation, these two parts are equal.

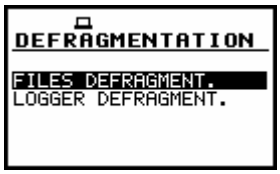
The same situation is in the case of the **LOGGER FREE SPACE** and **TOTAL AVAILABLE** characterizing the logger file. In order to enter the **DEFRAGMENTATION** sub-list the user has to select the **DEFRAGMENTATION** text in the **FILE** list, using the **<▲>**, **<▼>** (or **<◀>**, **<▶>**) push-buttons and press the **<ENTER>**.

DEFRAGMENTATION text highlighted (displayed inversely) in the FILE list

Notice: *The **DEFRAGMENTATION** must not be broken – the user should never press **<ESC>** or any other push-button during the DEFRAGMENTATION process.*

7.6.1 Merging result and setup files memory - FILES DEFRAGMENTATION

The **FILES DEFRAGMENT.** is used to join the result and setup files memory. In order to select this, the user has to display inversely the **FILES DEFRAGMENT.** text in the **DEFRAGMENTATION** sub-list using the **<▲>** (or **<◀>**) push-button.



FILES DEFRAGMENT. selected to the execution of the DEFRAGMENTATION operation

The **DEFRAGMENTATION** sub-list is closed and the instrument returns to the **FILE** list after pressing the **<ESC>** push-button. In order to continue the execution of the function one has to press the **<ENTER>** push-button. The instrument requests the confirmation of the operation. The next pressing of the **<ENTER>** push-button, when the **NO** option is selected, causes the closing of the window and the return to the **DEFRAGMENTATION** sub-list. The selection of the **NO** or **YES** option is possible using the **<◀>**, **<▶>** push-buttons. The return to the **DEFRAGMENTATION** sub-list is also possible after pressing the **<ESC>** push-button.

Confirmation windows during the execution of the FILES DEFRAGMENTATION operation

After pressing the **<ENTER>** push-button the instrument checks its current state. In the case when the measurements are performed, the execution of the **DEFRAGMENTATION** operation is not possible. In such case, the message is displayed and after few seconds instrument returns to the **DEFRAGMENTATION** sub-list.

Display after the attempt to perform an unavailable operation during measurement in progress

If the measurements are not performed, after pressing the **<ENTER>** push-button on the active **YES** option, the instrument checks whether the used result and setup files memory is continuous or not. If this memory is continuous, the **DEFRAGMENTATION** operation is not executed and the special message is displayed. The instrument waits for the reaction of the user (any push-button should be pressed except the **<SHIFT>** and **<ALT>** one) and after pressing a push-button it returns to the **DEFRAGMENTATION** sub-list.

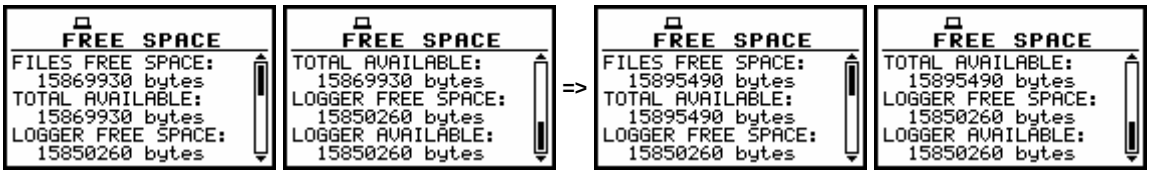
Message in the case when the execution of the DEFRAGMENTATION operation is unnecessary

If there are conditions to execute the **DEFRAGMENTATION** operation, it is done and the current progress is shown on the display.

After the successful execution, the special message is displayed and the instrument waits for the reaction of the user. Any push-button should be then pressed except the **<SHIFT>** and **<ALT>** one. After pressing a push-button, the instrument returns to the **DEFRAGMENTATION** sub-list.

Execution of the DEFRAGMENTATION operation

The displays below illustrate the results of the **FILES DEFRAGMENT**. – after the execution, the **FILES FREE SPACE** and **TOTAL AVAILABLE** become equal while the **LOGGER FREE SPACE** and **LOGGER AVAILABLE** remain unchanged.



Result of the FILES DEFRAGMENTATION operation

7.6.2 Merging logger files memory - LOGGER DEFRAGMENT.

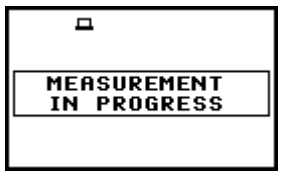
The **LOGGER DEFRAGMENT.** is used to join the logger files memory. In order to select this, the user has to display inversely the **LOGGER DEFRAGMENT.** text using the **<▲>** (or **<◄>**) push-button.

LOGGER DEFRAGMENT. selected to the execution of the DEFRAGMENTATION operation

The **DEFRAGMENTATION** sub-list is closed and the instrument returns to the **FILE** list after pressing the **<ESC>** push-button. In order to continue the execution of the function one has to press the **<ENTER>** push-button. The instrument requests the confirmation of the operation. The next pressing of the **<ENTER>** push-button, when the **NO** option is selected, causes the closing of the window and the return to the **DEFRAGMENTATION** sub-list. The selection of the **NO** or **YES** option is possible using the **<◄>**, **<►>** push-buttons. The return to the **DEFRAGMENTATION** sub-list is also possible after pressing the **<ESC>** push-button.

Confirmation windows during the execution of the LOGGER DEFRAGMENTATION operation

After pressing the **<ENTER>** push-button the instrument checks its current state. In the case when the measurements are performed, the execution of the **DEFRAGMENTATION** operation is not possible. In such case, the message is displayed and after few seconds instrument returns to the **DEFRAGMENTATION** sub-list.



Display after the attempt to perform an unavailable operation during measurement in progress

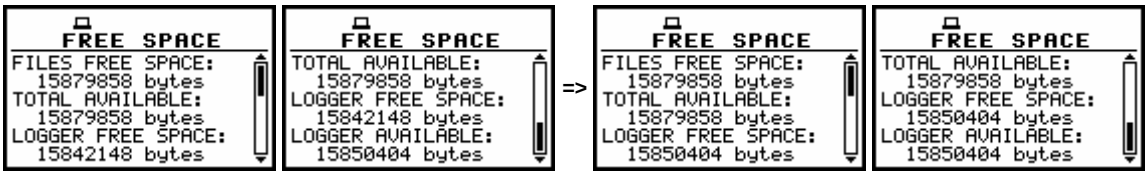
If the measurements are not performed, after pressing the **<ENTER>** push-button on the active **YES** option, the instrument checks whether the used logger files memory is continuous or not. If this memory is continuous, the **DEFRAGMENTATION** operation is not executed and the special message is displayed. The instrument waits for the reaction of the user (any push-button should be pressed except the **<SHIFT>** and **<ALT>** one) and after pressing a push-button it returns to the **DEFRAGMENTATION** sub-list.

Message in the case when the execution of the DEFRAGMENTATION operation is unnecessary

If there are conditions to execute the **DEFRAGMENTATION** operation, it is done and the current progress is shown on the display. After the successful execution, the special message is displayed and the instrument waits for the reaction of the user. Any push-button should be then pressed except the **<SHIFT>** and **<ALT>** one. After pressing a push-button the instrument returns to the **DEFRAGMENTATION** sub-list.

Execution of the DEFRAGMENTATION operation

The displays below illustrate the results of the **LOGGER DEFRAGMENT**. – after the execution the **LOGGER FREE SPACE** and **LOGGER AVAILABLE** become equal while the **FILES FREE SPACE** and **TOTAL AVAILABLE** remain unchanged.



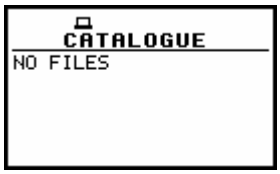
Result of the LOGGER DEFRAGMENTATION operation

7.7 Checking the contents of the memory - CATALOGUE

The **CATALOGUE** is used for checking the contents of the memory (the list of the result and setup files). In order to enter the window the user has to select the **CATALOGUE** text in the **FILE** list, using the **<▲>**, **<▼>** (or **<◀>**, **<▶>**) push-buttons and press the **<ENTER>** one.

CATALOGUE text highlighted (displayed inversely) in the FILE list

In the case when the instrument memory is empty (no file is stored), after entering the **CATALOGUE** the **NO FILES** text is displayed and the instrument waits for the reaction of the user. The user should press then the **<ESC>**, **<ENTER>** (the instrument returns to the **FILE** list) or **<START / STOP>** push-button (the instrument starts the measurement).



CATALOGUE window when the memory is empty

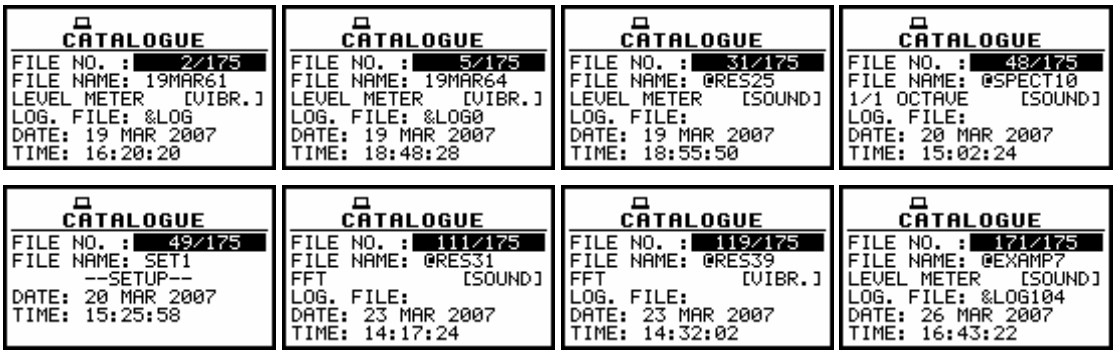
In the case when the result and setup files memory in the instrument is not empty (some files are stored) another window is displayed in which the same data about the existing in the instrument files as in the **FILE / LOAD** window are presented.

The current number of the file and the total number of the saved result and setup files is displayed in the first line of the window. The name of the file is displayed in the second line (its current number is presented in the first line).

The name of the file suggests the operation the file was created-in. The names in which the first character is @ are coming from the **AUTO SAVE** function. The file with the default name @Timer@ is coming from the **AUTO SAVE** function executed in the **TIMER** operation. The other names suggest the **SAVE** / **SAVE NEXT** function. The type of the current file (**LEVEL METER**, **1/1 OCTAVE, 1/3 OCTAVE**, **FFT** or **ENVELOPING**) and the mode **([VIBRATION])** is given in the third line. If during the measurements which results are saved in the file, the logger file was also created its name is displayed in the fourth line.

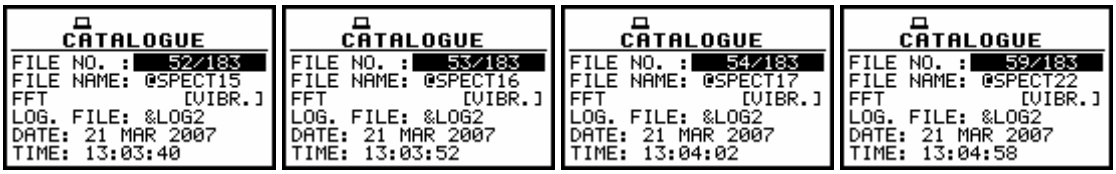
Notice: *The logger file can be deleted from the instrument's memory in the **FILE** / **DELETE** / **LOGGER FILES** window and this deleting operation does not modify the contents of the fourth line of the **CATALOGUE** window.*

The date and time of the **SAVE** operation are displayed in the fifth and sixth line, respectively. The change of the current file with the unit step can be done after pressing the **<◄>**, **<►>** push-buttons. The first file is available after pressing the **<◄>** with **<SHIFT>** push-button (or **<▼>** with **<SHIFT>**) and the last one is displayed after pressing the **<►>** with **<SHIFT>** push-button (or **<▲>** with **<SHIFT>**). The setup file is indicated by the **SETUP** text displayed in the third line instead of the **LEVEL METER** / **DOSE METER** text.



Contents of the CATALOGUE window

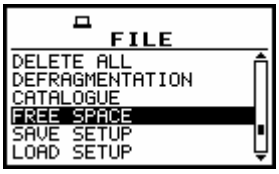
Notice: *Many result files can be associated with one logger file, i.e. during the execution of the **AUTO SAVE** function.*



Exemplary result files associated with the same logger file &LOG2 in the CATALOGUE window

7.8 Checking the free space in the memory - FREE SPACE

The **FREE SPACE** is used to read out the free space in the **FLASH DISC** memory of the instrument. In order to enter the window the user has to select the **FREE SPACE** text in the **FILE** list, using the **<▲>**, **<▼>** (or **<◀>**, **<▶>**) push-buttons and press the **<ENTER>** one.

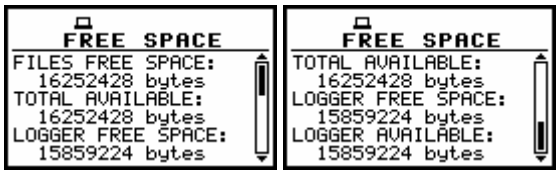


FREE SPACE text highlighted (displayed inversely) in the FILE list

The files memory in the instrument is divided into two separate parts.

One part is dedicated for saving the result and setup files and its size is equal to 16252428 bytes. The second part is used for saving the logger files and its size is equal to 15859224 bytes.

The **FREE SPACE** window in the instrument after the execution of the **DELETE ALL** operation is presented below.



FREE SPACE window after the execution of the DELETE ALL operation

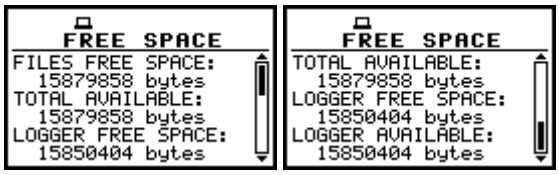
The **FREE SPACE** window contains four numbers. First two, named **FILES FREE SPACE** and **TOTAL AVAILABLE**, characterize the result and setup files memory.

The files are always saved starting from the beginning of the continuous memory space. The size in bytes of this space is given in the **FILES FREE SPACE** position.

If the result and setup files were not deleted from the memory the number of bytes displayed in the **TOTAL AVAILABLE** position is the same as in the **FILES FREE SPACE**. However, if some of them were deleted, assuming that they were not the last saved, the memory used by them is empty but it does not increase the continuous space.

In such case, the number given in the **TOTAL AVAILABLE** position is greater than that in the **FILES FREE SPACE**. The **DEFRAGMENTATION** operation, which merges files, should be used to increase the **FREE SPACE**.

The next two numbers given in the **FREE SPACE** window, named **LOGGER FREE SPACE** and **LOGGER AVAILABLE** characterize the logger files memory where the saving mechanism is the same. Therefore, the numbers presented in the **FREE SPACE** window depend on the history of the measurements and the operations performed by the user.



FREE SPACE window with the number depending on the measurements and operations performed

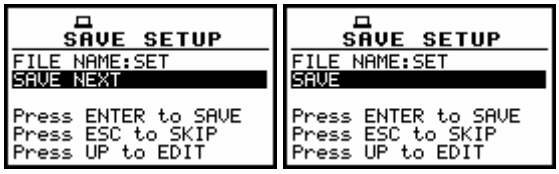
The window is closed and the instrument returns to the **FILE** list after pressing the **<ENTER>** or **<ESC>** push-buttons or it starts the measurements (after pressing the **<START / STOP>** one).

7.9 Saving setup files in the instrument's memory - SAVE SETUP

The **SAVE SETUP** is used for storing setup settings in the internal non-volatile (FLASH DISC) memory (files are always written at the beginning of a free continuous space) as a file (see Appendix B for the file formats). In order to enter the window the user has to select the **SAVE SETUP** text in the **FILE** list, using the **<▲>**, **<▼>** (or **<◄>**, **<►>**) push-button and press the **<ENTER>** one.

SAVE SETUP text highlighted (displayed inversely) in the FILE list

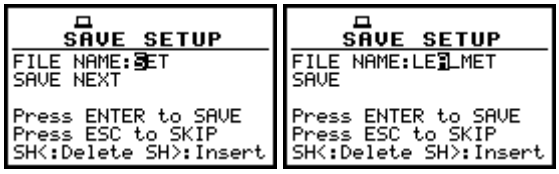
There are two available functions: the **SAVE NEXT** – save a setup file with the name increased by one, and **SAVE** – save a setup file with the edited name. These functions are available after pressing the **<◄>**, **<►>** push-buttons.



SAVE SETUP window in the FILE list

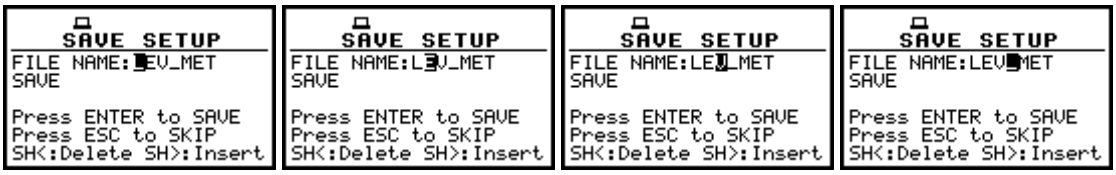
The name of the file, in which the setup settings are to be saved, is displayed above the **SAVE** or **SAVE NEXT** text. The default name for a setup file is displayed in the case of the first entering to this position (after power on). The default file name for setup settings is **SET**. The line of the setup file's name edition (**FILE NAME**) is opened after pressing the **<▲>** push-button.

The user can skip the setup file's name edition and start saving file pressing the **<ENTER>** push-button or return to the **FILE** list pressing the **<ESC>** one. The edition process is presented on the Figure below. The displayed inversely character is currently edited. The **<◄>**, **<►>**, **<◄>**, **<►>** and **<SHIFT>** push-buttons are used for editing the name which cannot exceed eight characters.



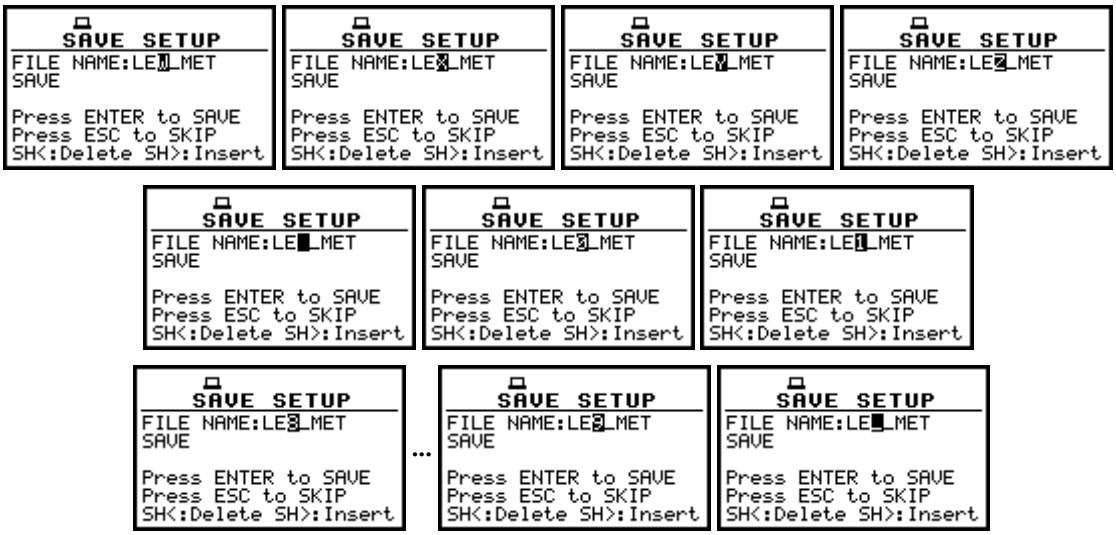
Display during the process of setting the character in the edited name

One can select the proper position of the character in the edited text using the **<◄>**, **<►>** push-buttons.

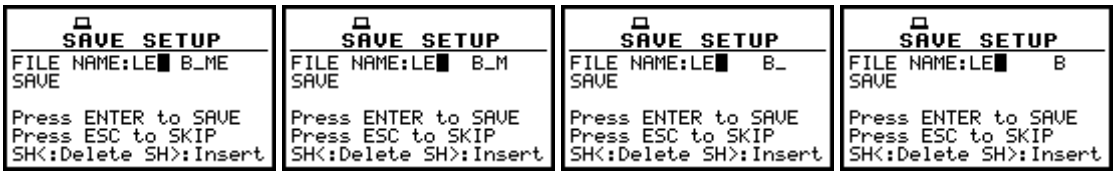


Display during the selection of the character's position to be edited

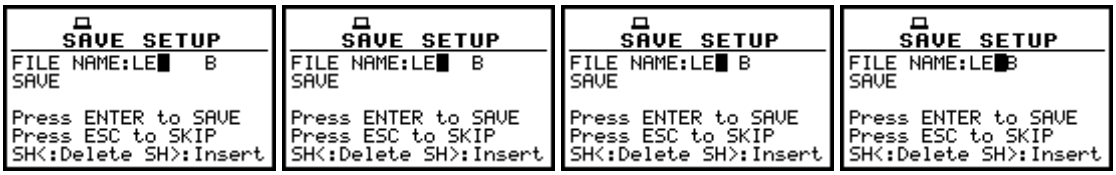
The available ASCII characters can be changed using the **<▲>** (or **<▼>**) push-button pressed together with the **<SHIFT>** one. The subsequent digits, underline, big letters and space appear on the display in the inversely displayed position after each pressing of the mentioned above push-buttons.



Display during the selection of the character

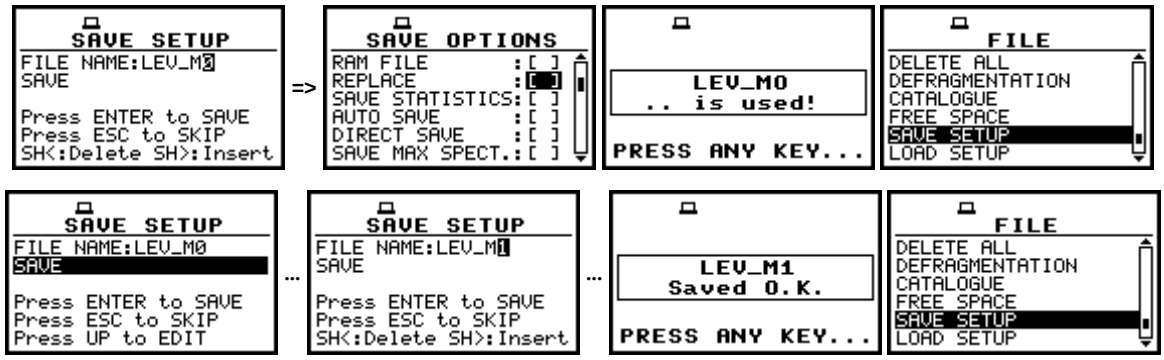


Displays in the FILE NAME edition after pressing the <SHIFT> and <►> push-buttons



Displays in the FILE NAME edition after pressing the <SHIFT> and <◄> push-buttons

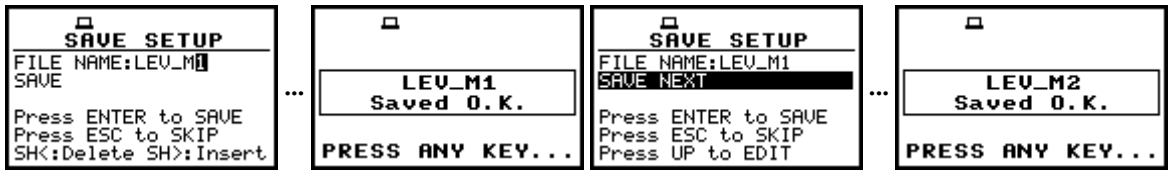
The edited name is accepted and the setup file is saved after pressing the **<ENTER>** push-button. The special warning is displayed in the case the file with the edited name already exists in the memory, if the **REPLACE** position is not activated (*path: MENU / FILE / SAVE OPTIONS*). The instrument waits then for a reaction of the user (any push-button should be pressed except the **<SHIFT>** or the **<ALT>**).



Displays during the attempt of overwriting the existing file, changing the name and saving data

All changes introduced to the setup file name during the edition are ignored after pressing the **<ESC>** push-button. This pressing causes the return to the list from which the **SAVE** option was entered. The return after the edition to the line with the **SAVE** or **SAVE NEXT** text is possible after pressing the **<▼>** push-button.

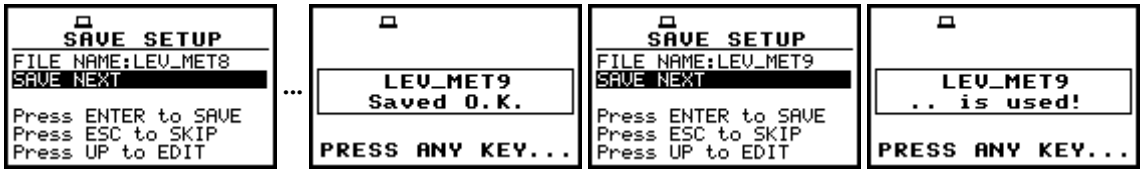
The simplified edition consists in the addition at the end of the file name the natural number. The increase by one of the number is made automatically. After the saving operation execution the new setup file name is displayed and the instrument waits then for a reaction of the user (any push-button should be pressed except the **<SHIFT>** or the **<ALT>** one). In the next attempt of saving data, the new name is displayed in the **FILE NAME** line and that name is increased by one during the saving operation.



Displays in the simplified edition of the setup file name and saving operation execution

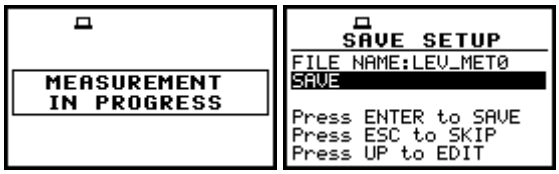
The number can be changed from 1 to N. The only limitation of the N value is the length of the file name, which cannot be longer than 8 characters. In the case when such limitation is achieved and the instrument can not change automatically the file's name the only possibility is to edit new base file name.

Notice: *The files can be overwritten (the use of the same file name)* ***without any warning*** *if the* ***REPLACE*** *option is switched on (path: MENU / FILE / SAVE OPTIONS / REPLACE).*



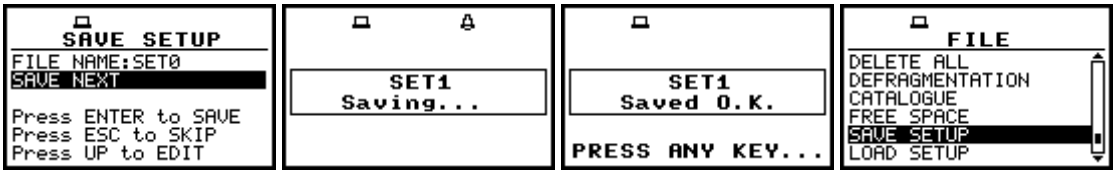
Displays in the simplified edition of the file name, saving and the "saturation" of that operation

As it was already written, the instrument attempts to save a file after pressing the **<ENTER>** push-button. The saving is not possible in the case when the instrument is measuring the signal. The special message is displayed for about 3 seconds in this case and the instrument returns to the **SAVE SETUP** window.



Displays after the attempt to perform unavailable saving operation; the return to the SAVE SETUP

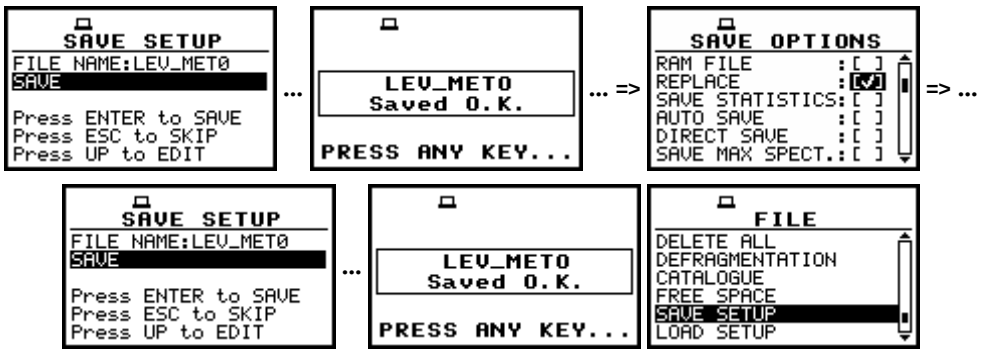
Notice: *During the execution of the **SAVE** or **SAVE NEXT** function an additional window is displayed informing about the operation performed. This window can be unnoticed by the user as it appears for the short time.*



View of all displays during and after the execution of the SAVE operation

As it was already written it is not possible to store the data in the file, which already exists, when the **REPLACE** is not active (**[ ]**) (*path: MENU / FILE / SAVE OPTIONS / REPLACE*).

The presented below sequence of displays illustrates the situation when during the name-edition process, the user selected the name that was used before but this time the **REPLACE** is active. The setup file is overwritten, the instrument displays a special message and waits for the reaction of the user (any push-button should be pressed except the **<SHIFT>** or the **<ALT>** one) and after pressing a push-button it returns to the **FILE** list.



Displays after the attempt to overwrite a file if the REPLACE is active

7.10 Loading the files with the setup settings - LOAD SETUP

The **LOAD SETUP** is used for loading setup setting file from the FLASH DISC (e.g. for performing different type of measurements with different instrument's settings). The position is opened after pressing the **<ENTER>** push-button when the **LOAD SETUP** text in the **FILE** list is displayed inversely (selected using the **<▼>** (or **<➤>**) or **<▼>** (or **<➤>** with the **<SHIFT>** push-buttons). The return to the **FILE** list is possible after pressing the **<ESC>** push-button.

FILE list with the LOAD SETUP text highlighted (displayed inversely)

Notice: It is not possible to load the file during the execution of the measurements. *On such attempt the message:* ***MEASUREMENT IN PROGRESS*** *is displayed for about 3 seconds.*

After pressing the **<ENTER>** push-button the instrument checks its current state. In the case when the measurements are performed, the file loading is impossible and the message is displayed.

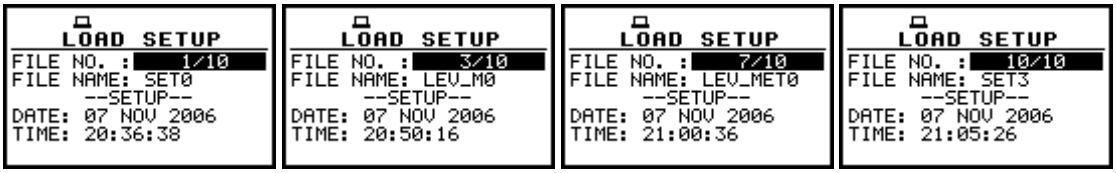
Display after the attempt to perform an unavailable operation during measurement in progress

In the case when the setup files were not saved, after entering the **LOAD SETUP** window, the **NO FILES** text is displayed and the instrument waits for the reaction of the user. The user should press then the **<ESC>**, **<ENTER>** (the instrument returns to the **FILE** list) or **<START / STOP>** push-button (the instrument starts the measurement).

Display during the execution of the LOAD SETUP operation

The current number of the setup file and the total number of the saved setup files is displayed in the first line of the **LOAD SETUP** window. The name of the file is displayed in the second line (its current number is presented in the first line).

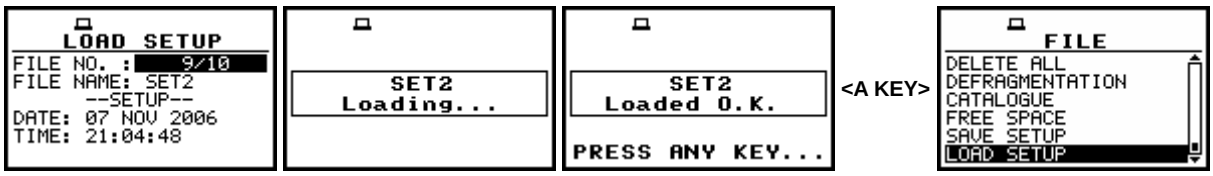
The date and time of the **SAVE SETUP** operation is displayed in the fourth and fifth line respectively. The change of the current file with the unit step can be done after pressing the **<◄>**, **<►>** push-buttons. The first file is available after pressing the **<◄>** with **<SHIFT>** push-button (or **<▼>** with **<SHIFT>**) and the last one is displayed after pressing the **<►>** with **<SHIFT>** push-button (or **<▲>** with **<SHIFT>**).



Exemplary contents of the LOAD SETUP window

The name of the file is accepted and the file is loaded after pressing the **<ENTER>** push-button. The message with the name of the selected file is displayed during the execution of the loading operation. The next message is displayed after successful end of loading operation. The instrument waits

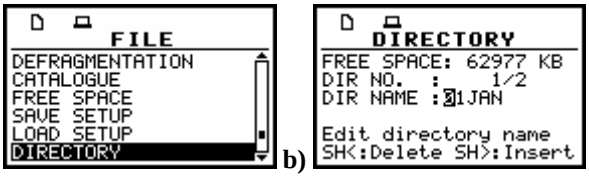
for the reaction of the user (any push-button should be pressed except the **<SHIFT>** or **<ALT>** one) and after pressing a push-button it returns to the **FILE** list.



Displays after the execution of the LOAD SETUP operation

7.11 Connecting the external USB memory stick- DIRECTORY

The **DIRECTORY** text appears in the **FILE** list when the USB memory stick is connected to the device. (It is necessary to select in the **USB–HOST PORT** window the **USB DISK** position, *path: MENU / SETUP / USB–HOST PORT / USB DISK*). In order to enter the window the user has to select the **DIRECTORY** text in the **FILE** list, using the **<▲>**, **<▼>** (or **<◄>**, **<►>**) push-buttons and press the **<ENTER>** one. The return to the **FILE** list is possible after pressing the **<ESC>** push-button.



FILE list with the DIRECTORY text selected (a) and the DIRECTORY window opened (b)

The **FREE SPACE** denotes the available free memory on the connected disk. The **DIR NO.** shows the number of the selected directory (the 1st number) and the number of the existing directories (the 2nd number). In the case the directories do not exist, these numbers are equal to zero. The **DIR NAME** enables one to edit the directory name (the 1st number) or displays its name. The help lines are placed at the display's bottom.

There are two ways of the current directory selection:

- the name edition in the **DIR NAME** line. The default name consists of the day number and the month abbreviation. The not existing directory will be created.
- the selection of the existing directory by means of the **<◄>**, **<►>** push-buttons pressed in the line with the **DIR NO.** text. The name of the selected directory is displayed in the **DIR NAME** line.

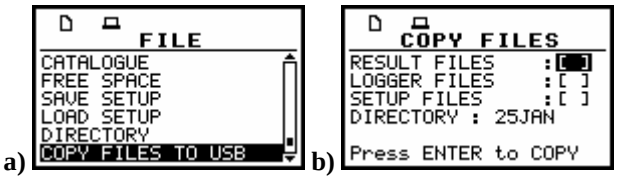
The selection is confirmed after pressing the **<ENTER>** push-button which closes the window and returns to the **FILE** list. The return to this list is also possible after pressing the **<ESC>** push-button but the selection is not confirmed. The selection of the directory is obligatory during the initialisation process. In this case also the **<ESC>** push-button confirms the settings.

FILE list, the DIRECTORY window

Notice: *After connecting a USB memory stick to the device the **paper sheet** icon appears in the top of the display.*

7.12 Copying files to the external USB memory stick- COPY FILES TO USB

The **COPY FILES TO USB** is used for copying files to the external USB memory stick. The position is opened after pressing the **<ENTER>** push-button when the **COPY FILES TO USB** text in the **FILE** list is displayed inversely. The return to the **FILE** list is possible after pressing the **<ESC>** push-button.

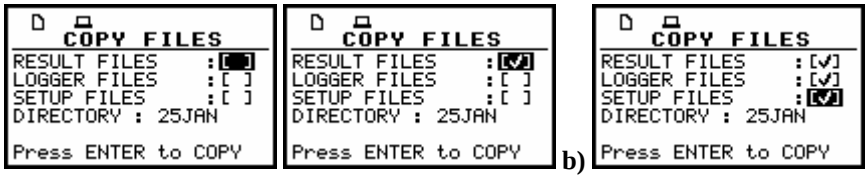


a) b)

FILE list with the COPY FILES TO USB text selected (a) and the COPY FILES window opened (b)

The **COPY FILES TO USB** sub-list consists of three positions to be selected: **RESULT FILES**, **LOGGER FILES** and **SETUP FILES** and **DIRECTORY** position with the name of the directory in which the files from the internal memory of the instrument will be stored.

In order to copy required type of the files the user has to place the special character in the line with the **RESULT FILES**, **LOGGER FILES** or **SETUP FILES** text using the **<➤>** or **<▼>** push-button. After next pressing the **<ENTER>** push-button, when no option is selected, the window is closed and the instrument returns to the **FILE** list. The return to the **FILE** list is also possible after pressing the **<ESC>** push-button.



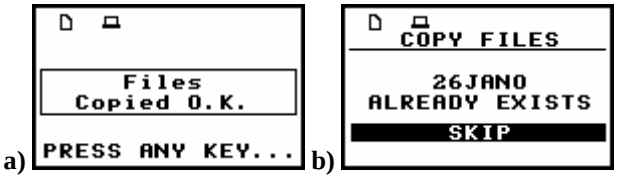
a) b)

RESULT FILES selection to the execution of the COPY FILES TO USB operation (a); the RESULT, LOGGER and SETUP files selected to the execution of the COPY FILES TO USB operation (b)

After pressing the **<ENTER>** push-button the instrument checks its current state. When the measurements are performed, the execution of the **COPY FILES TO USB** operation is not allowed. In such case, the message is displayed for a few seconds and the instrument returns to the **FILE** list.

Display after the attempt to perform an unavailable operation during measurement in progress

If the measurements are not performed, the instrument starts the operation. After the operation **Files Copied O.K.** message is presented on the display. If a file has been already copied to the USB stick, a message **ALREADY EXIST** is presented on the display as well as the name of the file.



a) b)

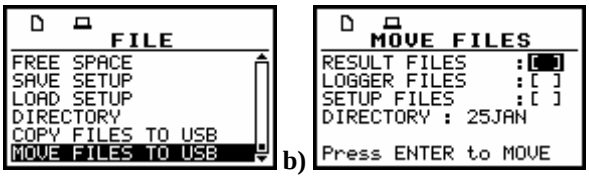
Display after the execution of COPY FILES TO USB operation (a) and when the file exists already (b)

7.13 Moving files to the USB memory stick- MOVE FILES TO USB

The **MOVE FILES TO USB** is used for moving files from internal instrument's memory to the USB memory stick.

The proper window is opened after pressing the **<ENTER>** push-button when the **MOVE FILES TO USB** text in the **FILE** list is displayed inversely.

The return to the **FILE** list is possible after pressing the **<ESC>** push-button.

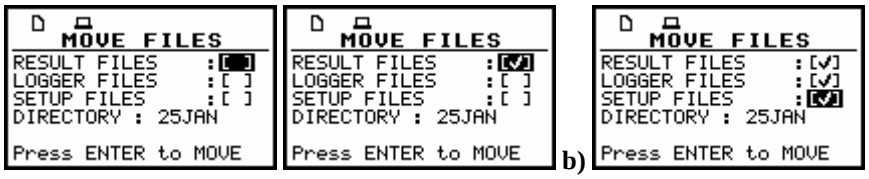


a) b)

FILE list with the MOVE FILES TO USB text selected (a) and the MOVE FILES window opened (b)

The **MOVE FILES TO USB** sub-list consists of three positions: **RESULT FILES**, **LOGGER FILES**, **SETUP FILES** and **DIRECTORY** position with the name of the file in which the files from the internal memory of the instrument will be stored.

In order to activate required position the user has to place the special character in the line with the **RESULT FILES**, **LOGGER FILES** or **SETUP FILES** text using the **<➤>** or **<▼>** push-button. After next pressing the **<ENTER>** push-button, when no option is selected, the window is closed and the instrument returns to the **FILE** list. The return to the **FILE** list is also possible after pressing the **<ESC>** push-button.



a) b)

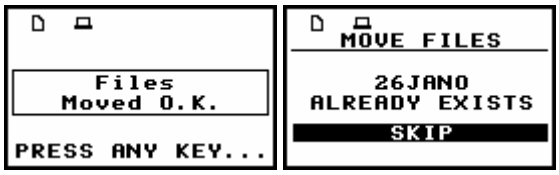
RESULT FILES selection to the execution of the MOVE FILES TO USB operation (a) the RESULT, LOGGER and SETUP files selected to the execution of the MOVE FILES TO USB operation (b)

After pressing the **<ENTER>** push-button the instrument checks its current state. In the case when the measurements are performed, the execution of the **MOVE FILES TO USB** operation is not possible. In such case, the message is displayed for few seconds and the instruments returns to the **FILE** list.

Display after the attempt to perform an unavailable operation during measurement in progress

If the measurements are not performed, the instrument starts the operation. After the operation **Files Moved O.K**. message is presented on the display.

If the file already exist in the USB memory stick the message with the name of the file and **ALREADY EXIST** text is presented on the display.



Display after the execution of MOVE FILES TO USB operation (a) and when the file already exists in the USB memory (b)

Notice: *After the execution of the* ***MOVE FILES TO USB*** *operation, files, which have been moved, do not exist in the internal instrument's memory any more.*

8 REPORTS PRINTING - REPORT

The printed reports of the vibration measurement results in the predefined format can be obtained by means of the **REPORT** list. In order to open the **REPORT** list the user has to:

- press the **<MENU>** push-button,
- select from the main list, using the **<▲>**, **<▼>** (or **<◀>**, **<▶>**) push-buttons, the **REPORT** text (highlight it inversely),
- press the **<ENTER>** push-button.

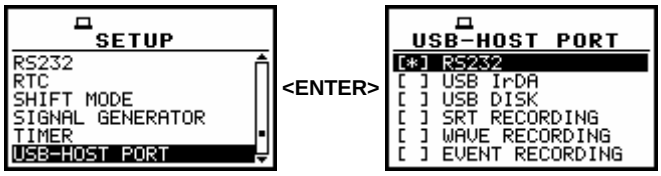
Display in the main list; the REPORT text highlighted (displayed inversely)

In order to obtain the report the user has to connect the instrument to the printer's RS 232 port using the **SV 55** RS 232 interface. This hardware interface is hidden in the Cannon type, 9-pin RS 232 plug-in. On the other end of the **SV 55** interface, which itself looks like a cable, there is the USB Host plug-in. This plug-in should be placed in the USB Host socket of the instrument.

It is also possible to **connect the instrument to the USB port** of a PC using the proper cable. Measurement results can be easy **downloaded to any PC** (**using USB interface and SvanPC software**) and printed out on the printer attached to a PC.

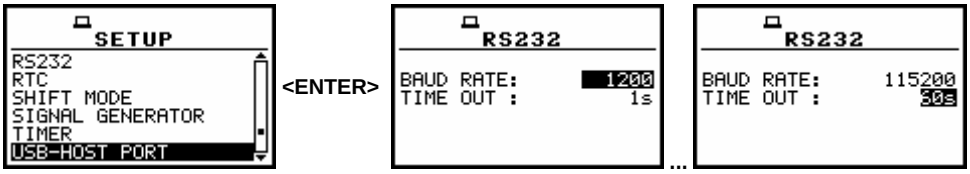
Notice: *The converter **SV 55** serves as the RS 232 interface. The **SV 55** connection to the **USB Host** socket is detected and after successful detection the headphone icon is switched on. The transmission using the **SV 55** is possible only in the case when the instrument is not connected to a PC with the **USB Device** port.*

The **RS232** is the default setting in the **USB–HOST PORT** in the **SETUP** list. Only in this option the USB host controller is awaken and the power consumption is the lower one.



SETUP list with the USB–HOST PORT selected and this window with the activated RS232

The user has to be sure that the **RS232** is activated (*path: MENU / SETUP / USB–HOST PORT / RS232*) before starting printing reports. Additionally, in the **RS232** list (*path: MENU / SETUP / RS232*) the user has to select the proper speed of the transmission and the parameter called **TIME OUT**.



SETUP list with the RS232 selected and the exemplary contents of this window

The RS 232 interface transmission (**BAUD RATE**) speed can be selected from the following available values: **1200** (bits / second), **2400** (bits / s), **4800** (bits / s), **9600** (bits / s), **19200** (bits / s), **38000** (bits / s), **57600** (bits / s) or **115200** (bits / s).

The selection is made by means of the **<◄>**, **<►>** push-buttons. The transmission speed should correspond to the one selected in a printer. The other RS 232 transmission parameters are fixed to **8 bits for data**, **No parity** & **1 Stop bit**. The default value of the **TIME OUT** parameter is equal to one but it can be too short period for the printers, which are not too fast. In such case, this parameter has to be increased.

The description of the **SV 55** pin-outs is given in App. C. The printers with the different connections on the RS 232 socket require the special, individual RS 232 – RS 232 cable that should fulfil the suitable wire crossing.

The printers, in which the Centronics interface is available instead of the RS 232 one, can be connected to the instrument by means of the **SV 52** RS 232 – Centronics interface.

The printers, which have only USB interface, are currently not driven by the instrument.

***Notice**: Switch the power off before connecting the instrument to any external device (e.g. a printer or a Personal Computer).*

The **REPORT** list contains the following elements:

TITLE that enables the user to give the header to the printed report;

PRINT RESULTS that enables the user to print out the measurement results on the default printer or to send the measurement result s to a PC using SvanPC software and USB interface;

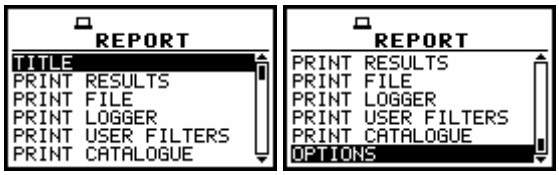
PRINT FILE that enables the user to print out on a printer the selected file with the measurement results or to send it to a PC using SvanPC software and USB interface

PRINT LOGGER that enables the user to print out on a printer connected directly to the instrument the measurement results in a selected file from the logger or to send it to a PC using SvanPC software and USB interface

PRINT USER FILTERS that enables the user to print out on a printer connected directly to the instrument the values of the user filters introduced in the instrument or to send them to a PC using SvanPC software and USB interface;

PRINT CATALOGUE that enables the user to print out the catalogue of the files

OPTIONS that enables the user to determine the options of the report.

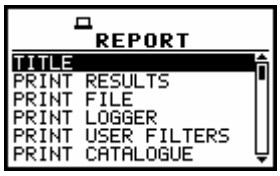


REPORT list

***Notice**: All reports are printed in the character format using the ASCII set.*

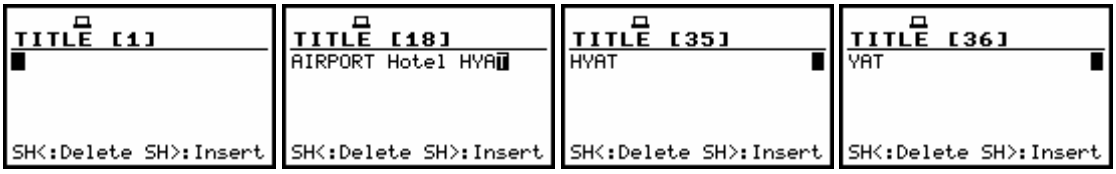
8.1 Edition of the user's text to be added to the reports - TITLE

The **TITLE** enables the user to edit the text added to the file and to the report to be printed. This operation is performed in the same way as it was described in the case of the **FILE NAME** window. In order to enter the position the user has to select the **TITLE** text in the **REPORT** list, using the **<▲>**, **<◄>** (or **<▲>**, **<◄>** with **<SHIFT>**) push-buttons and press the **<ENTER>** one.



REPORT windows with the TITLE selected

The text edition is made using the **<▲>**, **<▼>**, **<◄>**, **<►>** and **<SHIFT>** push-buttons. The **<◄>**, **<►>** push-buttons are used for changing the position of the edited character. The number (counted from the beginning of the text) of the edited character is displayed in the first line of the display, in the brackets. The text is limited to 128 characters.



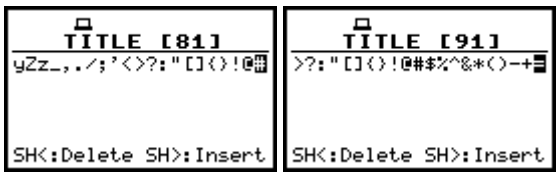
Displays in the text edition of the report's header

The **<▲>**, **<▼>** push-buttons are used for the selection of the ASCII characters. Digits, small and big letters as well as special characters, all together 91, are available (cf. the view of the displays below). Small and big letters are placed one after another.

Pressing the **<SHIFT>** and **<◄>** push-buttons causes that the highlighted character is erased from the text (**DEL** function). Pressing the **<SHIFT>** and **<►>** causes that the whole text is shifted one position to the right (**INSERT** function).

The window is closed and the instrument returns to the **REPORT** list after pressing the **<ENTER>** or **<ESC>** push-button. In the first case, the edited text is saved and will be added to the printed reports. In the latter case newly introduced text or the amendments made in the old one are ignored.

Displays with all available characters



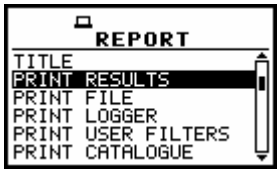
Displays with all available characters (cont.)

8.2 Printing of the measurement results - PRINT RESULTS

The **PRINT RESULTS** enables the user to print the report on the attached printer or to send out the report to a PC using the SvanPC software and the USB interface.

In order to enter the position the user has to select the **PRINT RESULT** text in the **REPORT** list, using the **<▲>**, **<▼>** (or **<◀>**, **<▶>**) push-buttons and press the **<ENTER>** one.

a)



REPORT windows with the PRINT RESULTS selected

After pressing the **<ENTER>** push-button the instrument checks its current state. In the case when the measurements are performed, the printing is impossible and the message is displayed.

Display after the attempt to perform an unavailable operation during measurement in progress

In the case when a measurement was already performed and a result is available, the message presented below is displayed.

Display in the REPORT list; the execution of the PRINT RESULTS

When the message is on the display, the data are transferred from the instrument to the attached printer. The instrument returns to the **REPORT** list after transferring all data.

The exemplary report printed in A5 format *(path: MENU / REPORT / OPTION / FORMAT A5)* with the **TITLE** "20JUL" *(path: MENU / REPORT / TITLE / 20JUL)* looks as follows:

```
 (C) SVANTEK     SVAN 956       No.12001
2007/07/20   (v6.05/6.05.2)   17:09:24

TITLE:
    20JUL


------------ SETTINGS -----------

Device mode........: VIBR. METER
Input..............: Accelerometer
Device function....: LEVEL METER
LEVEL METER version: 6.05
Meas. start date...: 2007/07/20
Meas. start hour...: 17:01:00
Range..............: HIGH
Ref.level for Acc..: 1 um/s2
Ref.level for Vel..: 1 nm/s
```

```
Ref.level for Dil..: 1 pm
Measure trigger....: Off
Logger trigger.....: Off
Repeat cycle.......: 1
Start delay........: 1 s
Integration time...: 10 s
Calibr. factor.....: -20.0 dB
Calibration by.....: Sensitivity
Calibration date...: 2007/07/20
Calibration hour...: 16:38:20
RMS integration....: Linear

Profile:     #1     #2     #3
Filter:      HP1    HP3    HP10
Detector:    1.0s   1.0s   1.0s
Logger:      None   PEAK   PEAK
                    RMS    RMS

--------------- RESULTS --------------

Measurement time: 00:00:10

Prof.:   #1          #2          #3
PEAK   8.61 m/s2   6.24 m/s2   4.90 m/s2
P-P    12.7 m/s2   10.0 m/s2   7.67 m/s2
MAX    2.04 m/s2   1.35 m/s2    624mm/s2
RMS    1.33 m/s2    923mm/s2    452mm/s2

---------------------------------------
```

Example of the printed results - A5 format

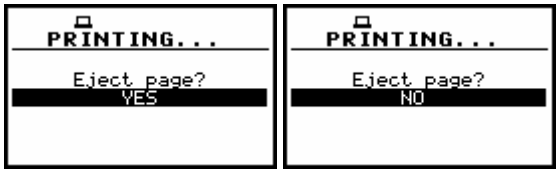
The same result's report printed in A4 format is presented below:

```
(C) SVANTEK     SVAN 956       No.12001 2007/07/20   (v6.05/6.05.2)   17:03:27

TITLE:
    20JUL


------------ SETTINGS -----------       ------------ SETTINGS -----------

Device mode........: VIBR. METER
Input..............: Accelerometer
Device function....: LEVEL METER        LEVEL METER version: 6.05
Meas. start date...: 2007/07/20         Meas. start hour...: 17:01:00
Range..............: HIGH                Ref.level for Acc..: 1 um/s2
Ref.level for Vel..: 1 nm/s             Ref.level for Dil..: 1 pm
Measure trigger....: Off                Logger trigger.....: Off
Repeat cycle.......: 1                  Start delay........: 1 s
Integration time...: 10 s               Calibr. factor.....: -20.0 dB
Calibration by.....: Sensitivity        Calibration date...: 2007/07/20
Calibration hour...: 16:38:20           RMS integration....: Linear

Profile:     #1     #2     #3          Profile:     #1     #2     #3
Filter:      HP1    HP3    HP10        Detector:    1.0s   1.0s   1.0s
Logger:      None   PEAK   PEAK
                    RMS    RMS

-------------------- RESULTS --------------------

Measurement time: 00:00:10

Prof.:     #1            #2            #3
PEAK     8.61  m/s2     6.24  m/s2     4.90  m/s2
P-P      12.7  m/s2     10.0  m/s2     7.67  m/s2
```

```
     MAX      2.04  m/s2     1.35  m/s2      624 mm/s2
     RMS      1.33  m/s2      923 mm/s2      452 mm/s2

     ------------------------------------------------
```

Example of the printed results from the VLM mode - A4 format

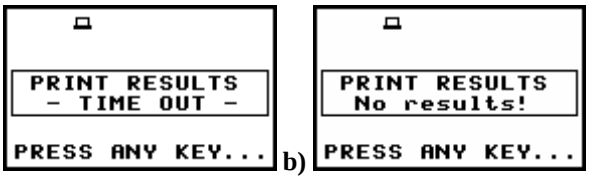
The following confirmation question is displayed after the printing, if the **Prompt** parameter was selected in the **EJECT P.** (*path: MENU / REPORT / OPTIONS / EJECT P.*). The user has to answer in this case if the paper in the printer has to be ejected to the new page. The change of the available answers is possible after pressing the **<◄>**, **<►>** push-buttons. The return to the **REPORT** list is performed after pressing the **<ENTER>** push-button with the possible ejection of the paper to the new page.



Displays with the confirmation request of the paper ejection

The similar message is displayed after sending out the statistics of the results, the contents of the selected file, the contents of the selected file in the logger and the catalogue of the files (**PRINT STATISTICS**, **PRINT FILE**, **PRINT LOGGER**, **PRINT USER FILTERS** and **PRINT CATALOGUE**).

The message about the time limit is displayed in the case when the printer (or a PC) is not connected or there is any other reason that it does not receive the data. The instrument waits for the reaction of the user (any push-button should be pressed except the **<SHIFT>** and **<ALT>** one) and after pressing a push-button it returns to the **REPORT** list. Another message is presented and the instrument waits for the reaction of the user in the case when there is no data to be printed.

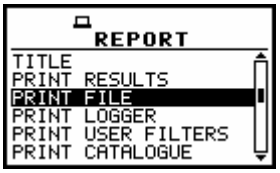


a) **b)**

Displays during the results printing when there is no transfer (a) and no data (b)

8.3 Printing of the measurement results from the selected file - PRINT FILE

The **PRINT FILE** enables the user to print out on a printer connected directly to the instrument the selected file with the measurement results or to send it to a PC using SvanPC software and the USB interface. In order to enter the position the user has to select the **PRINT FILE** text in the **REPORT** list, using the **<▲>**, **<▼>** (or **<◄>**, **<►>**) push buttons and press the **<ENTER>**.

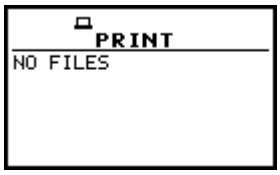


REPORT windows with the PRINT FILE selected

After pressing the **<ENTER>** push-button the instrument checks its current state. In the case when the measurements are performed, the printing is impossible and the message is displayed.

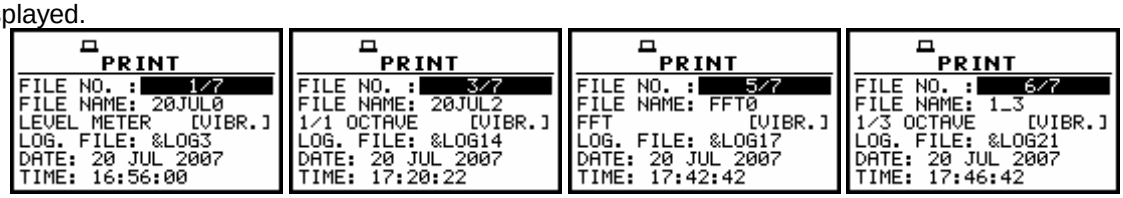
Display after the attempt to perform an unavailable operation during measurement in progress

If no files were saved in the instrument's memory then after pressing **<ENTER>** a special message is displayed and the unit waits for the reaction of the user. In this time any push-button should be pressed except the **<SHIFT>** and **<ALT>** one and after pressing a push-button the instrument returns to the **REPORT** list.



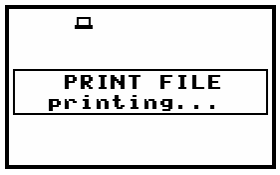
Display in the REPORT list; the PRINT FILE position when no files were saved

In the consecutive lines of the display the current file number, the total number of the files, the file name, file type, date and time of registration are presented. The change of the current file with the unit step can be done pressing the **<◄>**, **<►>** push-buttons. After pressing the **<◄>** with **<SHIFT>** push-button the first file is available and after pressing the **<►>** with **<SHIFT>** push-button - the last one is displayed.



Displays during the selection of the file to be printed

The contents of the selected file is sent out to a PC after pressing the **<ENTER>** push-button. The following message is displayed on the display during the printing:



Display during the execution of the PRINT FILE operation

The instrument returns to the **REPORT** list when all data are transferred but if the **Prompt** parameter was selected (*path: MENU / REPORTS / OPTIONS / EJECT P. / Prompt*), the described in the **PRINT RESULTS** message is displayed on the display after the printing. The user has to answer in this case if the Line Feed has to be added to the transferred data. The change of the available answers is possible after pressing the **<◄>**, **<►>** push-buttons. The return to the **REPORT** list is performed after pressing the **<ENTER>** push-button with the possible Line Feed addition.

Display during the file sending out when there is no data transfer

The message about the time limit is displayed in the case when the printer (or PC) is not connected or there is any other reason that it does not receive the data. The instrument waits for the reaction of the user (any push-button should be pressed except the **<SHIFT>** and **<ALT>** one) and it returns to the **REPORT** list after pressing a push-button.

The exemplary printed file contents are presented below.

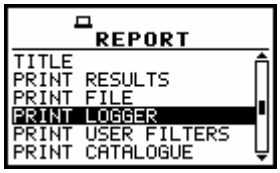
```
 (C) SVANTEK     SVAN 956       No.12001
2007/08/18   (v6.06/6.06.3)   16:32:37

File name: @RES14

TITLE:

------------ SETTINGS -----------

Device mode........: VIBR. METER
Input..............: Accelerometer
Device function....: LEVEL METER
LEVEL METER version: 6.06
Meas. start date...: 2007/08/17
Meas. start hour...: 18:01:04
Range..............: HIGH
Ref.level for Acc..: 1 um/s2
Ref.level for Vel..: 1 nm/s
Ref.level for Dil..: 1 pm
Measure trigger....: Off
Logger trigger.....: Off
Repeat cycle.......: Infinity
Start delay........: 1 s
Integration time...: 10 s
Calibr. factor.....: 0.0 dB
RMS integration....: Linear

Profile:     #1     #2     #3
Filter:      HP1    HP3    HP10
Detector:    1.0s   1.0s   1.0s
Logger:      None   None   None

--------------- RESULTS --------------

Measurement time: 00:00:10

Prof.:   #1          #2          #3
PEAK    115mm/s2  97.7mm/s2  90.2mm/s2
P-P     211mm/s2   188mm/s2   176mm/s2
MAX    24.3mm/s2  20.9mm/s2  18.2mm/s2
RMS    20.0mm/s2  18.0mm/s2  16.2mm/s2
VDV    49.5mm/sX  44.2mm/sX  39.4mm/sX

Remark:  X = 1.75
```

Example of the printed file from the VIBRATION LEVEL METER mode - format A5

8.4 Printing of the logger results - PRINT LOGGER

The **PRINT LOGGER** enables the user to print out on a printer connected directly to the instrument the measurement results in a selected file from the logger or to send them to a PC using SvanPC software and USB interface. In order to enter the position the user has to select the **PRINT LOGGER** text

in the **REPORT** list, using the **<▲>**, **<▼>** (or **<◀>**, **<▶>**) push buttons and press the **<ENTER>**. This option is under development - **Function not available** text appears on the display.

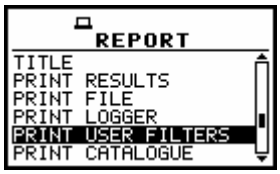


REPORT windows with the PRINT LOGGER selected

PRINT LOGGER window opened - Function not available message

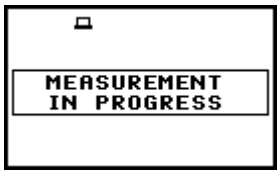
8.5 Printing of the coefficients of the user filters - PRINT USER FILTERS

The **PRINT USER FILTERS** enables the user to print out the values of the user filters introduced in the instrument: **S1**, **S2**, **S3**.



REPORT windows with the PRINT USER FILTERS selected

In order to enter the position the user has to select the **PRINT USER FILTERS** text in the **REPORT** list, using the **<▲>**, **<▼>** (or **<◀>**, **<▶>**) push buttons and press the **<ENTER>**. After pressing the **<ENTER>** push-button the instrument checks its current state. In the case when the measurements are performed, the printing is impossible and the message is displayed.



Display after the attempt to perform an unavailable operation during measurement in progress

The selection of the **USER FILTER** is made by means of the **<◀>**, **<▶>** push buttons.

PRINT USER FILTERS windows; the user filter selection

The contents of the selected file is sent out to the attached printer (or to a PC) after pressing the **<ENTER>** push-button. The following message is displayed on the display during the printing:

Display in the REPORT list; the execution of the PRINT USER FILTERS

When the message is on the display, the data are transferred from the instrument to the attached printer (or PC). The instrument returns to the **REPORT** list after transferring all data.

In the case when the printer or PC is not connected or there is any other reason that it does not receive the data the message about the time limit is displayed. The instrument waits for the reaction of the user (any push-button should be pressed except the **<SHIFT>** and **<ALT>**) and after pressing a push-button it returns to the **REPORT** list.

The exemplary **USER FILTER** coefficients printed in A4 format look as follows:

(C) SVANTEK SVAN 956 No.12001 2007/07/20 (v6.05/6.05.2) 17:03:27

Vibration meter mode filter

------- S1 ------		------- S1 ------		------- S1 ------	
[Hz]	[dB]	[Hz]	[dB]	[Hz]	[dB]
0.80	-INF	25.00	40.0	800.00	10.0
1.00	-100.0	31.50	50.0	1000.00	0.0
1.25	-90.0	40.00	60.0	1250.00	-10.0
1.60	-80.0	50.00	70.0	1600.00	-20.0
2.00	-70.0	63.00	80.0	2000.00	-30.0
2.50	-60.0	80.00	90.0	2500.00	-40.0
3.15	-50.0	100.00	100.0	3150.00	-50.0
4.00	-40.0	125.00	90.0	4000.00	-60.0
5.00	-30.0	160.00	80.0	5000.00	-70.0
6.30	-20.0	200.00	70.0	6300.00	-80.0
8.00	-10.0	250.00	60.0	8000.00	-90.0
10.00	0.0	315.00	50.0	10000.00	-100.0
12.50	10.0	400.00	40.0	12500.00	-INF
16.00	20.0	500.00	30.0	16000.00	-INF
20.00	30.0	630.00	20.0	20000.00	-INF

Example of the printed coefficients of the user filter S1- format A4

(C) SVANTEK SVAN 956 No.12001
2007/08/18 (v6.06/6.06.3) 16:32:37

Vibration meter mode filter

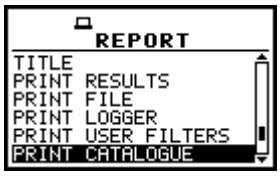
------- S2 ------		------- S2 ------	
[Hz]	[dB]	[Hz]	[dB]
0.80	-INF	160.00	1.0
1.00	-INF	200.00	1.0
1.25	-INF	250.00	1.0
1.60	-INF	315.00	3.0
2.00	0.0	400.00	3.0
2.50	0.0	500.00	3.0
3.15	0.0	630.00	1.0
4.00	0.0	800.00	1.0
5.00	0.0	1000.00	1.0
6.30	0.0	1250.00	1.0
8.00	0.0	1600.00	1.0

10.00	0.0	2000.00	0.0
12.50	0.0	2500.00	0.0
16.00	0.0	3150.00	0.0
20.00	0.0	4000.00	0.0
25.00	0.0	5000.00	0.0
31.50	0.0	6300.00	0.0
40.00	0.0	8000.00	0.0
50.00	0.0	10000.00	-INF
63.00	0.0	12500.00	-INF
80.00	0.0	16000.00	-INF
100.00	1.0	20000.00	-INF
125.00	0.0		

Example of the printed coefficients of the user filter S2 - format A5

8.6 Printing of the file's catalogue - PRINT CATALOGUE

The **PRINT CATALOGUE** enables the user to print the catalogue of the files stored in the instrument on the attached printer. In order to enter the position the user has to select the **PRINT CATALOGUE** text in the **REPORT** list, using the **<▲>**, **<▼>** (or **<◀>**, **<▶>**) push buttons and press the **<ENTER>**.

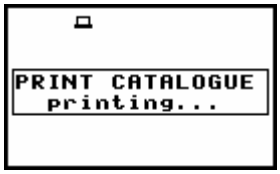


REPORT windows with the PRINT CATALOGUE selected

After pressing the **<ENTER>** push-button the instrument checks its current state. In the case when the measurements are performed, the printing is impossible and the message is displayed.

Display after the attempt to perform an unavailable operation during measurement in progress

After pressing the **<ENTER>** push-button the following message is displayed:



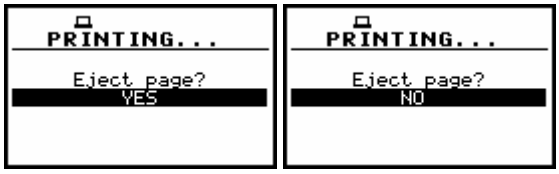
Display in the REPORT list; the execution of the PRINT CATALOGUE

When the message is on the display, the data are transferred from the instrument to the attached printer.

The instrument returns to the **REPORT** list after transferring all data but if the **Prompt** parameter was selected in the **EJECT P.** (*path: MENU / REPORT / OPTIONS / EJECT P.*), the confirmation question is displayed after the printing. The user has to answer in this case if the paper in the printer has to be

ejected to the new page. The change of the available answers is possible after pressing the **<◄>**, **<►>** push-buttons.

The return to the **REPORT** list is performed after pressing the **<ENTER>** push-button with the possible ejection of the paper to the new page.



Displays with the confirmation request of the paper ejection

The exemplary printed catalogue is presented below.

```
(C) SVANTEK     SVAN 956       No.12001 2007/08/18   (v6.06/6.06.3)   16:38:08

CATALOGUE CONTENTS                        Number of files: 15

Name      Mf  Length    Date    Time     Name      Mf  Length    Date    Time
@RES1    <Vo>    426  07/08/17  17:59   @RES2    <Vo>    426  07/08/17  17:59
@RES3    <Vo>    426  07/08/17  17:59   @RES4    <Vo>    426  07/08/17  17:59
@RES5    <Vo>    426  07/08/17  17:59   @RES6    <Vo>    426  07/08/17  17:59
@RES7    <Vo>    426  07/08/17  18:00   @RES8    <Vo>    426  07/08/17  18:00
@RES9    <Vo>    426  07/08/17  18:00   @RES10   <Vo>    426  07/08/17  18:00
@RES11   <Vo>    426  07/08/17  18:00   @RES12   <Vl>    380  07/08/17  18:00
@RES13   <Vl>    380  07/08/17  18:01   @RES14   <Vl>    380  07/08/17  18:01
SET0     <  >   2280  07/08/17  18:05

-------------------------------------  -------------------------------------
```

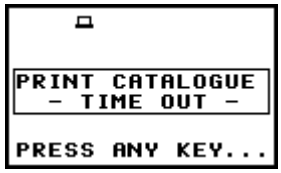
Example of the printed catalogue - format A4

The same catalogue printed in A5 format looks as follows:

```
(C) SVANTEK     SVAN 956       No.12001
2007/08/18   (v6.06/6.06.3)   16:36:59

CATALOGUE CONTENTS
Number of files: 15

Name      Mf  Length    Date    Time
@RES1    <Vo>    426  07/08/17  17:59
@RES2    <Vo>    426  07/08/17  17:59
@RES3    <Vo>    426  07/08/17  17:59
@RES4    <Vo>    426  07/08/17  17:59
@RES5    <Vo>    426  07/08/17  17:59
@RES6    <Vo>    426  07/08/17  17:59
@RES7    <Vo>    426  07/08/17  18:00
@RES8    <Vo>    426  07/08/17  18:00
@RES9    <Vo>    426  07/08/17  18:00
@RES10   <Vo>    426  07/08/17  18:00
@RES11   <Vo>    426  07/08/17  18:00
@RES12   <Vl>    380  07/08/17  18:00
@RES13   <Vl>    380  07/08/17  18:01
@RES14   <Vl>    380  07/08/17  18:01
SET0     <  >   2280  07/08/17  18:05

-------------------------------------
```

Example of the printed catalogue - format A5

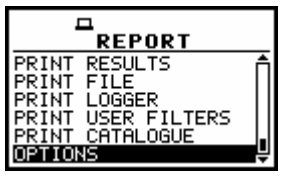
When the catalogue of the files is empty (the measurement results were not saved), the instrument returns to the **REPORT** list without any reaction.



Display during the catalogue printing when there is no data transfer

8.7 Selection of the printing options - OPTIONS

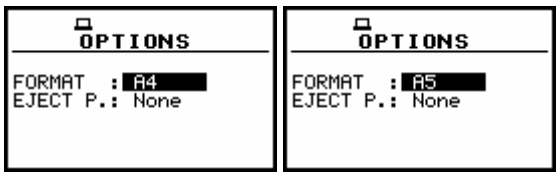
Using the **OPTIONS** the user can select the format of the listing (**FORMAT**), can control the way the paper is ejected in the printer (**EJECT P.**). In order to enter the position the user has to select the **OPTIONS** text in the **REPORT** list, using the **<▲>**, **<▼>** (or **<◀>**, **<▶>**) push-buttons and press the **<ENTER>**.



REPORT windows with the OPTION selected

8.7.1 Selection of the format of the print out - FORMAT

The **FORMAT** enables the user to select the format of the listing (**A4** and **A5** options are available). In order to confirm the selection the **<ENTER>** push-button has to be pressed. After this confirmation, the **OPTIONS** sub-list is closed. In order to ignore any changes made in the **OPTIONS** sub-list the user has to press the **<ESC>** push-button.

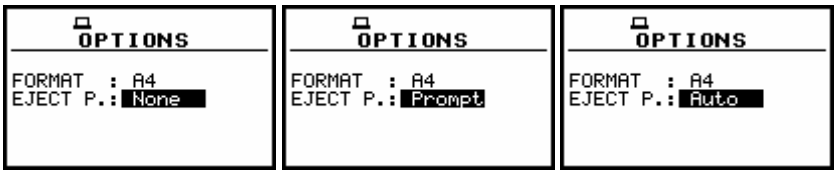


OPTIONS windows; the selection of the format

8.7.2 Controlling the paper ejection after print out - EJECT P.

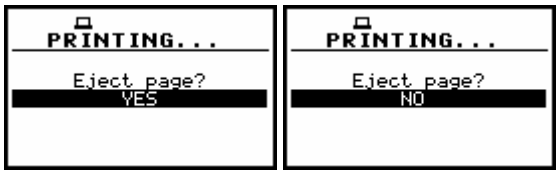
The **EJECT P.** enables the user to control the ejection of the paper after the listing is done. The following options are available: **Prompt** (the instrument asks whether to eject the page after printing report, statistics or catalogue), **Auto** (after printing, the paper is ejected) and **None** (the paper is not ejected after printing). In particular, it is possible to have one result after another using the **None** or **Prompt** options.

In the **EJECT P.** position any change is performed by means of the **<◀>**, **<▶>** push-buttons. In order to confirm the selection the **<ENTER>** push-button has to be pressed. After this confirmation, the **OPTIONS** sub-list is closed. In order to ignore any changes made in the **OPTIONS** sub-list the user has to press the **<ESC>** push-button.



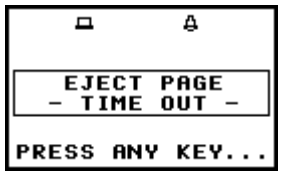
OPTIONS windows; the selection of the paper ejection

The request is displayed after the printing of the measurement results, the statistics of the results, the contents of the selected file, the contents of the selected file in the logger and the catalogue of the files (**PRINT RESULTS**, **PRINT FILE**, **PRINT LOGGER**, **PRINT USER FILTERS**, **PRINT CATALOGUE**) if the **Prompt** parameter was selected in the **EJECT P.** position of the **OPTIONS** sub-list. The user has to answer in this case if the paper in the printer has to be ejected to the new page. The change of the available answers is possible after pressing the **<◄>**, **<►>** push-buttons. The return to the **REPORT** list is performed after pressing the **<ENTER>** push-button with the possible ejection of the paper to the new page.



Displays with the request for the confirmation of the paper ejection

The message about the time limit is displayed in the case when the printer is not connected or there is any other reason that it does not eject a paper. The instrument waits for the reaction of the user (any push-button should be pressed except the **<SHIFT>** one) and after pressing a push-button it returns to the **REPORT** list.



Display after a printing when there is not possible to eject a paper

9 SETUP MENU - SETUP

The **SETUP** list contains different sub-lists and positions. Some of them are directly related with vibration measurements, and some - with the settings of the hardware components of the instrument. In order to open the **SETUP** list the user has to:

- press the **<MENU>** push-button,
- select from the main list, using the **<▲>**, **<▼>** (or **<◄>**, **<►>**) push-buttons, the **SETUP** text (highlight it inversely),
- press the **<ENTER>** push-button.

Display in the main list; the SETUP text highlighted (displayed inversely)

In the **SETUP** list, the following items are available:

LANGUAGE	it enables the user to set language of the user interface.
CLEAR SETUP	it enables the user to return to the default, factory setup.
EXTERNAL I/O SETUP	it enables the user to select the available functionality of the **Ext. I/O** port.
HUMAN VIB. FILT.	it enables the user to activate **HUMAN VIBRATION FILTERS.** This position appears only before activation of those filters.
IEPE CURRENT	it enables the user to choose current IEPE supply.
REFERENCE LEVELS	it enables the user to select the reference level for calculation of the vibration measurement results
REMOTE COMMUNICATION	it enables the user to select the type of remote communication and packet size for data transmission.
RMS INTEGRATION	it enables the user to select the way of integration for the **RMS** measurement.
RPM MEASUREMENT	it enables the user to activate the **RPM** (**R**evolution **P**er **M**inute) measurement option. This position does not appear after activation of the function.
RS232	it enables the user to set the transmission speed and the timeout in the RS232 interface.
RTC	it enables the user to set the **R**eal **T**ime **C**lock.
SHIFT MODE	it enables the user to set the operating mode of the **<SHIFT>** and the **<START / STOP>** push-buttons.
SIGNAL GENERATOR	it enables the user to activate **SIGNAL GENERATOR** function.
TIMER	it enables the user to set the Timer function.
USB–HOST PORT	it enables the user to select the available functionality of the **USB Host** port.
USER FILTERS	it enables the user to select and set the correcting values for all real-time and 1/1 and 1/3 octave filters.
VIBRATION UNITS	it enables the user to select the vibration units in which the results of the measurements are to be given. This position is taken off from the menu in the sound meter and voltage (sound) mode.
WARNINGS	it enables the user to switch on or off the warnings that can be displayed during the operation of the instrument.

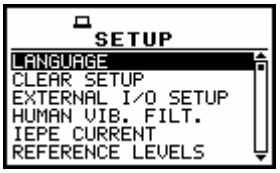
Pressing the **<SHIFT>** and **<▲>** (or **<SHIFT>** and **<◄>**) push-buttons results in a movement to the first position of the opened list and pressing the **<SHIFT>** and **<▼>** (or **<SHIFT>** and **<►>**) – results in a movement to the last position of the opened list.

In each available position any change is performed by means of the **<◄>**, **<►>** push-buttons. In order to confirm the selection the **<ENTER>** push-button has to be pressed. After this confirmation, the opened window or list is closed. In order to ignore any changes made in the opened window or list the user has to press the **<ESC>** push-button.

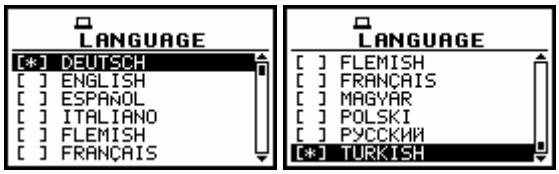
SETUP list

9.1 Setting the language of the user interface - LANGUAGE

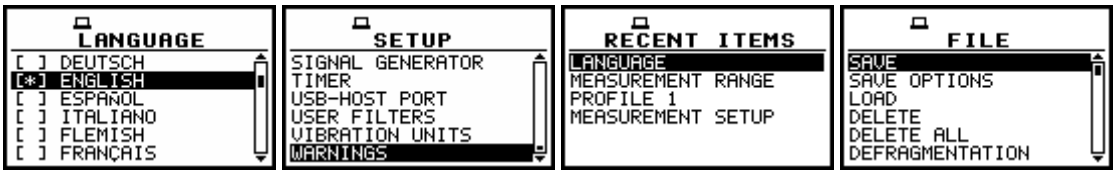
The **LANGUAGE** enables one to select the language of the user interface. In order to enter the list one has to press the **<ENTER>** push-button on the inversely displayed **LANGUAGE** text of the **SETUP** list. The selection is made by placing a special character by means of the **<◄>**, **<►>** push-buttons in the line with the selected language. Pressing the **<SHIFT>** and **<▲>** (or **<SHIFT>** and **<◄>**) push-buttons results in a movement to the first position of the opened list and pressing the **<SHIFT>** and **<▼>** (or **<SHIFT>** and **<►>**) – results in a movement to the last position of the opened list. The selection is confirmed and the list is closed after pressing the **<ENTER>** push-button. The list is closed without any confirmation after pressing the **<ESC>** push-button.



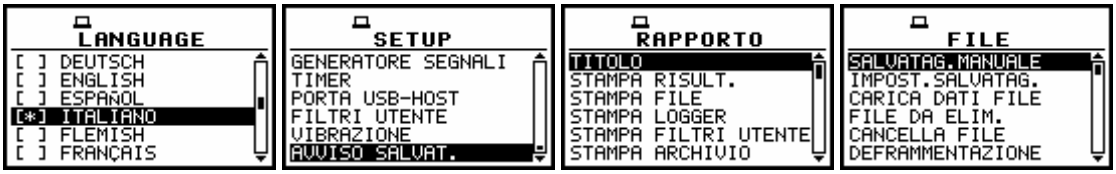
SETUP list; the LANGUAGE text highlighted (displayed inversely)



Language windows with all available languages

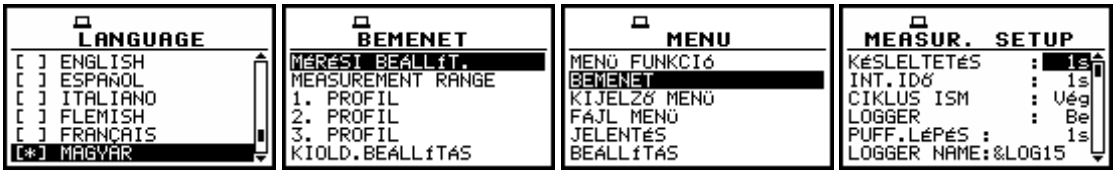


Displays with the English version of the user interface

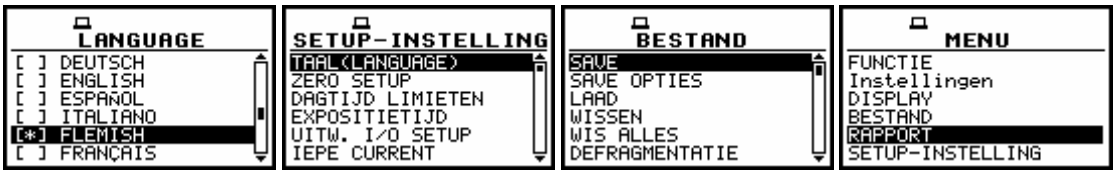


Displays with the Italian version of the user interface

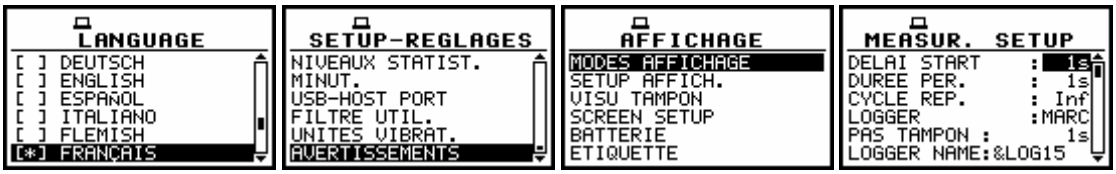
Displays with the Polish version of the user interface



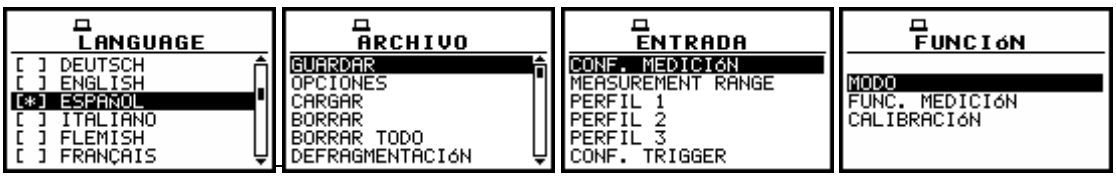
Displays with the Hungarian version of the user interface



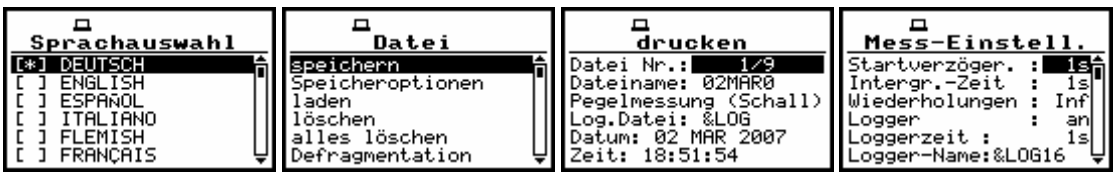
Displays with the Flemish version of the user interface



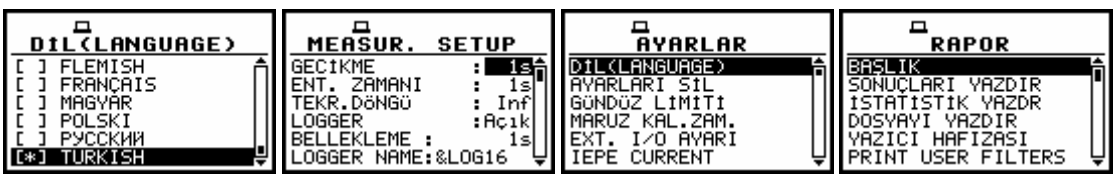
Displays with the French version of the user interface



Displays with the Spanish version of the user interface

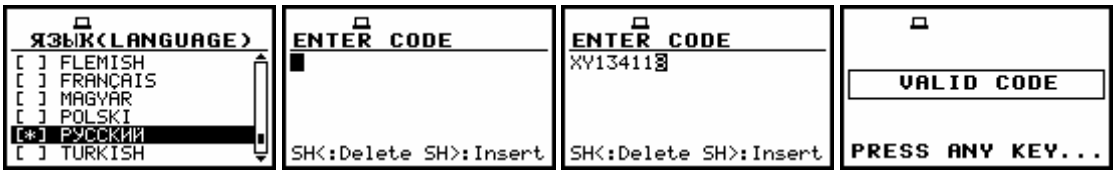


Displays with the German version of the user interface



Displays with the Turkish version of the user interface

For activation of the Russian version of the user interface, the special code has to be entered.



Displays during the entering of the access code to the Russian version of the user interface

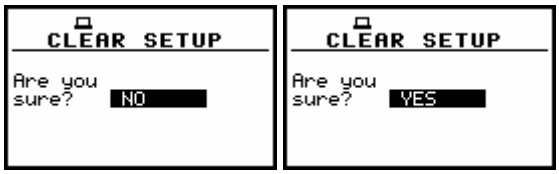
Displays with the Russian version of the user interface available only on some markets

9.2 Return to the factory settings - CLEAR SETUP

The **CLEAR SETUP** enables the user to return to the default set up of the instrument. In order to enter the position the user has to select the **CLEAR SETUP** text in the **SETUP** list, using the **<▲>**, **<▼>** (or **<◀>**, **<▶>**) push-buttons and press the **<ENTER>**.

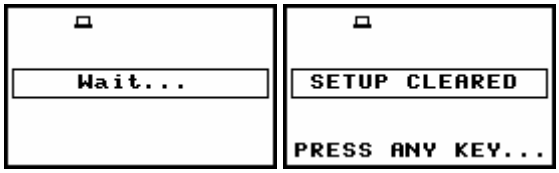
SETUP list; the CLEAR SETUP text highlighted (displayed inversely)

After entering this position, the request for the confirmation is displayed. The proper answer for the request is selected by means of the **<◀>**, **<▶>** push-buttons. The instrument returns to the default set up after pressing the **<ENTER>** push-button in the case when the answer **YES** was chosen.



Displays with the request for the confirmation for the CLEAR SETUP execution

During the clearing process the message **WAIT...** is displayed. The following message is displayed after the return to the default settings and the instrument waits for the user's reaction.



Displays during and after the execution of the CLEAR SETUP function

The window is closed and the instrument returns to the **SETUP** list after pressing any push-button with an exception of the **<SHIFT>** and the **<ALT>** one.

9.3 Setting parameters of the Ext. I/O port - EXTERNAL I/O SETUP

The **EXTERNAL I/O SETUP** enables the user to select the available functionality of the **Ext. I/O** port. In order to enter the window the user has to select the **EXTERNAL I/O SETUP** text in the **SETUP** list, using the **<▲>**, **<▼>** (or **<◄>**, **<►>**) push-buttons and press the **<ENTER>** one.

SETUP list, the EXTERNAL I/O SETUP text highlighted

In order to select a value in a position of the sub-list the **<◄>**, **<►>** should be pressed. The position of the sub-list is changed after pressing the **<▲>**, **<▼>** push-buttons. In order to confirm the selection the **<ENTER>** push-button has to be pressed. Such pressing closes the sub-list. After pressing the **<ESC>** push-button the sub-list is also closed but all changes, which were made, are ignored.

9.3.1 Mode selection of the Ext. I/O port - MODE

In the **MODE**, it is possible to select the function of the instrument's socket named as **Ext. I/O**. This socket can be used as

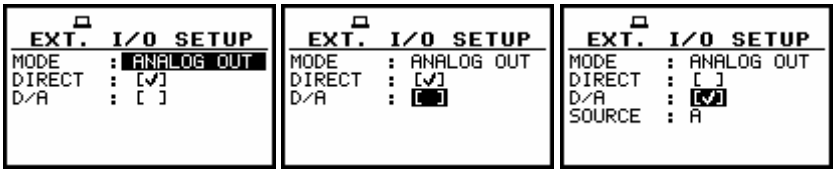
- the output of the analogue signal (**ANALOG OUT**) transmitted from the input of the instrument to its output without any digital processing (i.e. filtering),
- the input of the digital signal used as an external trigger to start the measurements (**DIGITAL IN**) in the "slave" instrument,
- the digital output (**DIGITAL OUT**) used for triggering other "slave" instrument from the "master" one,
- the source of any alarm signal in the case of certain circumstances occurred during the measurements (i.e. the level of the input signal was higher than selected one).

The more detailed description of the **Ext. I/O** is given in App. C.

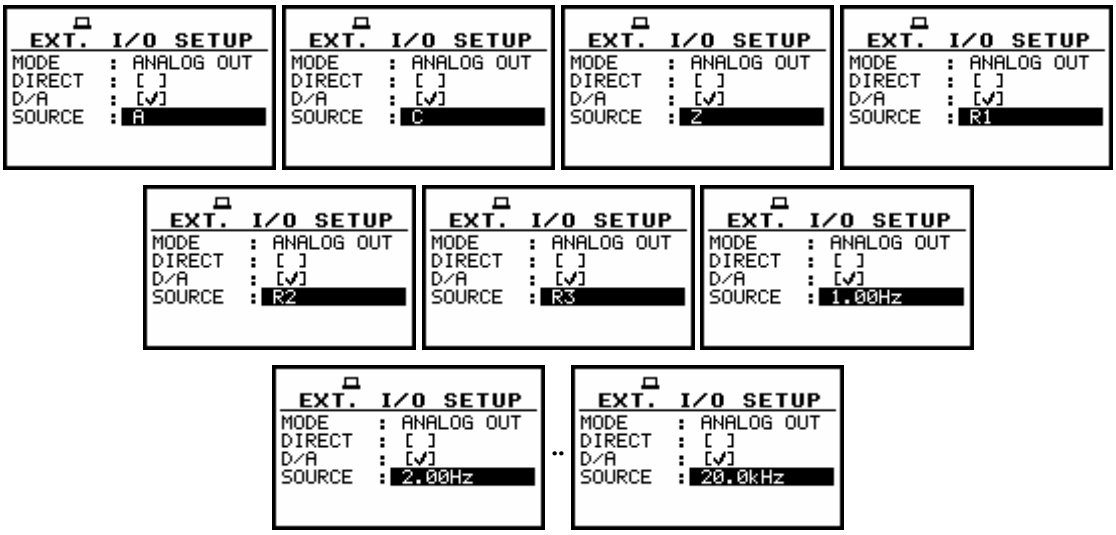
To select the mode, the user has to use the **<◄>**, **<►>** push-buttons in the line with the **MODE** text. The window is closed and the instrument returns to the **SETUP** list after pressing the **<ENTER>** (with the confirmation of all changes made there) or **<ESC>** push-buttons (ignoring all changes).

EXTERNAL I/O SETUP windows; the MODE selection

In the case of **ANALOG OUT** selection there are two options **DIRECT** and **D/A** (**Digital/Analog**). To select the option the user has to place a special character in the line with the option's name using **<◄>**, **<►>** and **<▲>**, **<▼>** push-buttons. In the case of **D/A** option the **SOURCE** position appears on the display. The available sources are as follows: **A**, **C**, **Z**, **R1**, **R2**, **R3**, **1 Hz**, **2 Hz**, **...**, **20kHz**. The selection of the **SOURCE** is made by means of **<◄>**, **<►>** push-buttons and pressing **<ENTER>**.

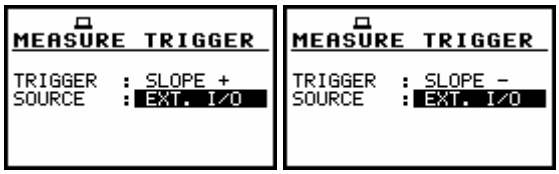


EXTERNAL I/O SETUP windows; D/A selection



EXTERNAL I/O SETUP windows; the source selection for D/A option

In the case of **DIGITAL IN** selection the signal appearing on the **I/O** socket will be treated as the external trigger if the **EXT. I/O** is chosen (*path: MENU / INPUT / TRIGGER SETUP / MEASURE TRIGGER / SOURCE / EXT. I/O*) and it can be set only if **SLOPE +** or **SLOPE –** was set as a **TRIGGER** (*path: MENU / INPUT / TRIGGER SETUP / MEASURE TRIGGER / TRIGGER*).

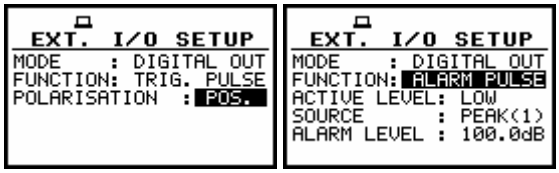


MEASURE TRIGGER windows; the EXT. I/O selection

9.3.2 Digital output function selection of the I/O socket - FUNCTION

In the **FUNCTION,** it is possible to set the function of the digital output of the **I/O** instrument's socket. The socket can be used as the source of the trigger pulse (**TRIG. PULSE**) which starts the measurement in another "slave" instrument linked to the "master" one or the alarm signal which appears there after fulfilling certain measurement conditions (**ALARM PULSE**).

In order to select the function of the digital output the user has to use the **<➤>**, **<➤>** push-buttons in the active line with the **FUNCTION** text. The window is closed and the instrument returns to the **SETUP** list after pressing the **<ENTER>** (with the confirmation of all changes made there) or **<ESC>** push-buttons (ignoring all changes).

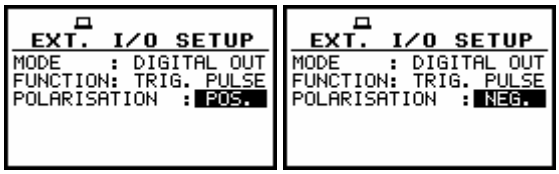


EXTERNAL I/O SETUP windows; the FUNCTION selection

9.3.3 Polarisation selection of the digital output signal - POLARISATION

In the **POLARISATION**, it is possible to select which polarisation of the signal (negative or positive) will be valid.

In order to select the polarisation the user has to use the **<◄>**, **<►>** push-buttons in the active line with the **POLARISATION** text. The window is closed and the instrument returns to the **SETUP** list after pressing the **<ENTER>** (with the confirmation of all changes made there) or **<ESC>** push-buttons (ignoring all changes).

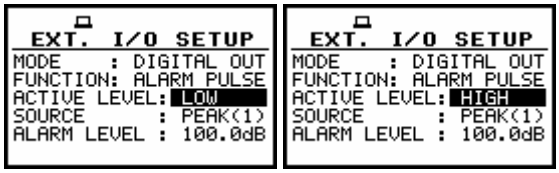


EXTERNAL I/O SETUP windows; the POLARISATION selection

9.3.4 Active level selection of the digital output signal - ACTIVE LEVEL

In the **ACTIVE LEVEL**, it is possible to select which level of the signal should be treated as a valid one (“negative” or “positive” logic).

In order to select the level the user has to use the **<◄>**, **<►>** push-buttons in the active line with the **ACTIVE LEVEL** text. The window is closed and the instrument returns to the **SETUP** list after pressing the **<ENTER>** (with the confirmation of all changes made there) or **<ESC>** push-buttons (ignoring all changes).

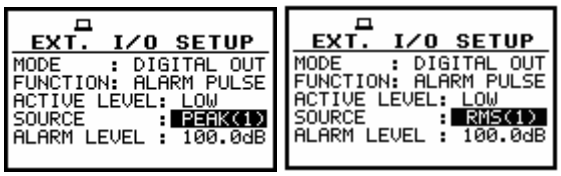


EXTERNAL I/O SETUP windows; the ACTIVE LEVEL selection

9.3.5 Source signal selection for the alarm pulse generation - SOURCE

In the **SOURCE**, it is possible to select the measurement result which level should be checked. If the measured result level is greater than selected alarm level – the instrument will generate alarm signal on the **I/O** socket. The measurement results from the first profile: **PEAK(1)** or **RMS(1)** can be used for the purpose described above.

In order to select the function of the digital output the user has to use the **<◄>**, **<►>** push-buttons in the active line with the **SOURCE** text. The window is closed and the instrument returns to the **SETUP** list after pressing the **<ENTER>** (with the confirmation of all changes made there) or **<ESC>** push-buttons (ignoring all changes).



EXTERNAL I/O SETUP windows; the SOURCE selection

9.3.6 Alarm level selection on the digital output of I/O - ALARM LEVEL

In the **ALARM LEVEL**, it is possible to set the level of the result to be monitored during the measurements. If the result is greater than the one set in this line, the instrument will generate the alarm signal in the selected logic. The available levels are within the range [30.0 dB, 140 dB].

The **ALARM LEVEL** current value decreasing / increasing by 0.1 dB is possible by means of the **<◄>/ <►>**push-buttons. The step can be decreased / increased up to 1 dB after pressing simultaneously the **<◄>/ <►>** push-buttons with the **<SHIFT>** one. The window is closed and the instrument returns to the **SETUP** list after pressing the **<ENTER>** (with the confirmation of all changes made in the window) or **<ESC>** push-buttons (ignoring all changes).

EXTERNAL I/O SETUP windows; the ALARM LEVEL setting

9.4 Activation of human vibration filters - HUMAN VIB. FILT.

In the **HUMAN VIBR. FILT.** it is possible to activate the human vibration filters (**Wk**, **Wd**, **Wc**, **Wj**, **Wm**, **Wh**, **Wg**, **Wb**), which are not included in the standard set of the instrument. This option can be bought together with the instrument or can be purchased by the user in the future. In the latter case, after selecting the **HUMAN VIB. FILT.** text in the **SETUP** list (in vibration modes), using the **<▲>**, **<▼>** (or **<◄>**, **<►>**) push-buttons, and pressing **<ENTER>**, the user has to introduce special code for activation of the function. After successful activation the **HUMAN VIBRATION** filters, this text does not appear on the **SETUP** list any more and the instrument never more asks for the code.

SETUP list, the HUMAN VIB. text highlighted (displayed inversely)

Displays during the entering of the access code to a function

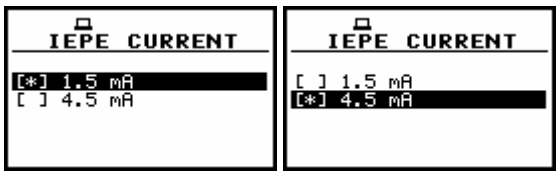
9.5 Selection of the current IEPE supply - IEPE CURRENT

The **IEPE CURRENT** enables the user to choose current IEPE supply.

In order to enter the window the user has to select the **IEPE CURRENT** text in the **SETUP** list, using the **<▲>**, **<▼>** (or **<◄>**, **<►>**) push-buttons and press the **<ENTER>** one.

SETUP list, the IEPE CURRENT text highlighted (displayed inversely)

Two options are available: **1.5 mA** and **4.5 mA**. The selection is made by placing a special character in the required position by means of the **<◄>**, **<►>** (or **<▲>**, **<▼>**) push-buttons. The window is closed and the instrument returns to the **SETUP** list after pressing the **<ENTER>** (with the confirmation of a change made in the position) or **<ESC>** push-buttons (ignoring a change made in the position).



IEPE CURRENT windows; the IEPE supply selection

9.6 Reference signal in vibration measurements - REFERENCE LEVELS

The **REFERENCE LEVELS** sub-list enables the user to set the reference level of the vibration signal. The values, which are set here, are taken into account during the calculations of the measurement results expressed in the logarithmic scale (with the dB as the units).

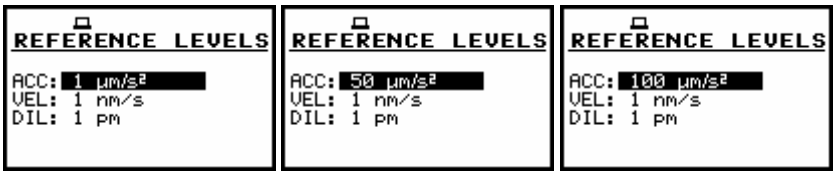
In order to enter the position the user has to select the **REFERENCE LEVELS** text in the **SETUP** list, using the **<▲>**, **<▼>** (or **<◄>**, **<►>**) push-buttons and press the **<ENTER>** one. The selection of a parameter which level has to be set is done by means of the **<▲>**, **<▼>** push-buttons.

SETUP list, the REFERENCE LEVELS text highlighted (displayed inversely)

9.6.1 Setting the reference level of the acceleration signal - ACC

In the **ACC** position the user can set the reference level of the acceleration signal. It is possible to set this level from 1 μms^{-2} to 100 μms^{-2} with 1 μms^{-2} step pressing the **<◄>**, **<►>** push-buttons. The step can be increased to 10 μms^{-2} pressing the **<SHIFT>** with the **<◄>**, **<►>** push-buttons.

In order to confirm the setting the **<ENTER>** push-button has to be pressed. Such pressing closes the sub-list. After pressing the **<ESC>** push-button the sub-list is also closed but all changes, which were made, are ignored.

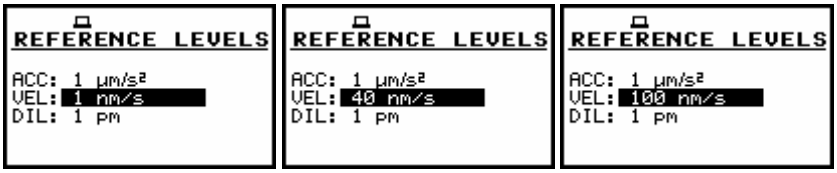


REFERENCE LEVELS windows; the reference level setting of acceleration signal

9.6.2 Setting the reference level of the velocity signal - VEL

In the **VEL** position, the user can set the reference level of the velocity signal. It is possible to set this level from 1 nms^{-1} to 100 nms^{-1} with 1 nms^{-1} step pressing the **<◄>**, **<►>** push-buttons. The step can be increased to 10 nms^{-1} pressing the **<SHIFT>** with the **<◄>**, **<►>** push-buttons.

In order to confirm the setting the **<ENTER>** push-button has to be pressed. Such pressing closes the sub-list. After pressing the **<ESC>** push-button the sub-list is also closed but all changes, which were made, are ignored.

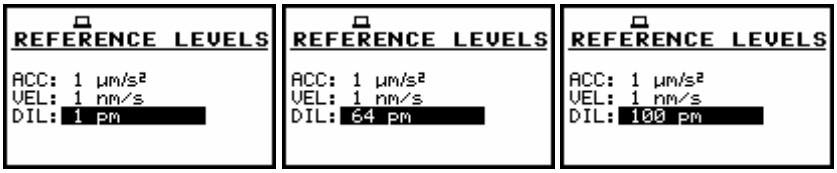


REFERENCE LEVEL windows; setting the reference level of velocity signal

9.6.3 Setting the reference level of the displacement signal - DIL

In the **DIL** position, the user can set the reference level of the displacement signal. It is possible to set this level from 1 pm to 100 pm with 1 pm step pressing the **<◄>**, **<►>** push-buttons. The step can be increased to 10 pm pressing the **<SHIFT>** with the **<◄>**, **<►>** push-buttons.

In order to confirm the setting the **<ENTER>** push-button has to be pressed. Such pressing closes the sub-list. After pressing the **<ESC>** push-button the sub-list is also closed but all changes, which were made, are ignored.



REFERENCE LEVELS windows; setting the reference level of displacement signal

9.7 Parameters of remote communication - REMOTE COMMUNICATION

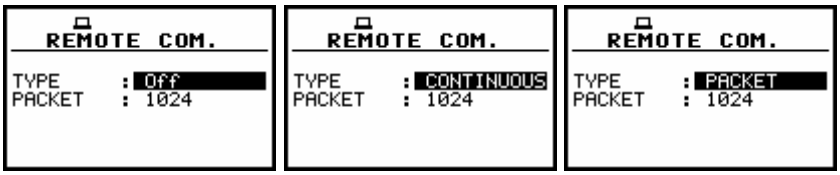
The **REMOTE COMMUNICATION** enables the user to select the type and set the packet size of the packet communication.

In order to enter the position the user has to select the **REMOTE COMMUNICATION** text in the **SETUP** list, using the **<▲>**, **<▼>** (or **<◄>**, **<►>**) push-buttons and press the **<ENTER>**.

SETUP list, the REMOTE COMMUNICATION text highlighted (displayed inversely)

9.7.1 Selecting the type of remote communication - TYPE

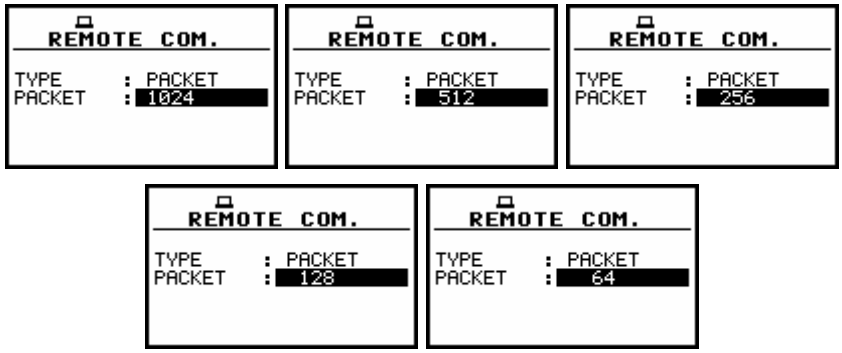
The **TYPE** enables the user to select the type of the **REMOTE COMMUNICATION**. Three options are available: **Off**, **CONTINUOUS** and **PACKET**. The selection of the required option is made by **<◄>**, **<►>** push-buttons. The confirmation is made by pressing **<ENTER>** push button.



REMOTE COMMUNICATION windows; the TYPE selection

9.7.2 Setting the packet size of the remote communication - PACKET

In the case of the **PACKET** type it is possible to select the packet size. The available options are **1024**, **512**, **256**, **128** and **64**. The selection is made by the **<◄>**, **<►>** push-buttons. The confirmation is made by pressing the **<ENTER>** push button.



REMOTE COMMUNICATION windows; packet size selection

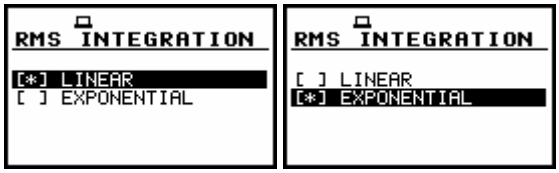
9.8 Detector's type selection in the RMS calculations - RMS INTEGRATION

The **RMS INTEGRATION** enables the user to select the detector type for the calculations of the **RMS** function.

In order to enter the position the user has to select the **RMS INTEGRATION** text in the **SETUP** list, using the **<▲>**, **<▼>** (or **<◄>**, **<►>**) push-buttons and press the **<ENTER>**.

SETUP list with the RMS INTEGRATION text highlighted (displayed inversely)

Two options are available: **LINEAR** and **EXPONENTIAL**. The required parameter can be selected by means of the **<▲>**, **<▼>** (or **<◄>**, **<►>**) push-buttons. The window is closed and the instrument returns to the **SETUP** list after pressing the **<ENTER>** (with the confirmation of a change made in the position) or **<ESC>** push-buttons (ignoring a change made in the position).



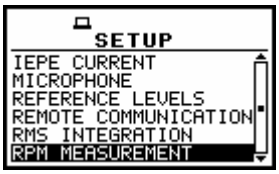
Displays and with the available options of the RMS INTEGRATION

The formulae used for the **RMS** calculation are given in Appendix D. Setting **LINEAR** is required for getting the true RMS value of the measured signal. When this option is selected the value of the **RMS** function do not depend on the detector time constant: 100ms, 125ms, 200ms, 500ms, 1.0s, 2.0s, 5.0s, 10.0s**.** In this case, the indicator **Lin.** (or **L**) is displayed in the different modes of the result presentation.

Setting **EXPONENTIAL** enables the user to fulfil the requirements of another standard for the **RMS** measurements. When this option is selected the value of the **RMS** function depends on the detector time constant (the results are displayed **with** the indicator of the detectors selected in the profiles (*path: MENU / INPUT / PROFILE x / DETECTOR:* 100ms, 125ms, 200ms, 500ms, 1.0s, 2.0s, 5.0s, 10.0s).

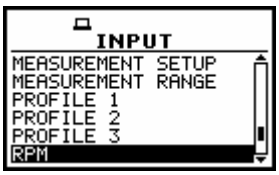
9.9 Activation of RPM measurement function - RPM MEASUREMENT

The **RPM MEASUREMENT** (**RPM - R**evolutions **P**er **M**inute) position enables the user to activate the **RPM** measurement function, which is not included in the standard set of the instrument. It can be bought together with the instrument or can be purchased by the user in the future. In the latter case, after selecting the **RPM MEASUREMENT** text in the **SETUP** list, using the **<▲>**, **<▼>** (or **<◄>**, **<►>**) push-buttons, and pressing **<ENTER>**, the user has to introduce special code for activation of the function. After successful activation the **RPM MEASUREMENT**, this text does not appear on the **SETUP** list any more (**RMP** position appears then in the **INPUT** list) and the instrument never more asks for the code.



SETUP list, the RPM MEASUREMENT text highlighted (displayed inversely)

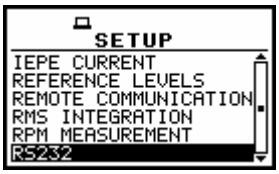
Displays during the entering of the access code to a function



INPUT list after activation of the RPM MEASUREMENT function

9.10 Setting the parameters of the serial interface - RS232

The **RS232** enables the user to programme the RS 232 interface transmission speed (**BAUD RATE**) and to set the time limit before which the interface operation should be performed (**TIME OUT**). In order to enter the position the user has to select the **RS232** text in the **SETUP** list, using the **<▲>**, **<▼>** (or **<◄>**, **<►>**) push-buttons and press the **<ENTER>**.

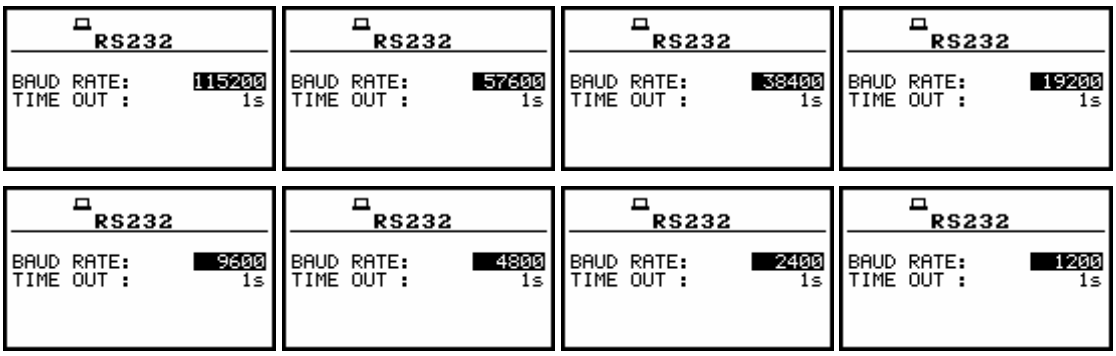


SETUP list, the RS232 text highlighted (displayed inversely)

9.10.1 Setting the transmission speed of the serial interface - BAUD RATE

The RS 232 interface transmission (**BAUD RATE**) speed can be selected from the following available values: **1200** (bits / second), **2400** (bits / s), **4800** (bits / s), **9600** (bits / s), **19200** (bits / s), **38000** (bits / s), **57600** (bits / s) or **115200** (bits / s). The selection is made by means of the **<◄>**, **<►>** push-buttons.

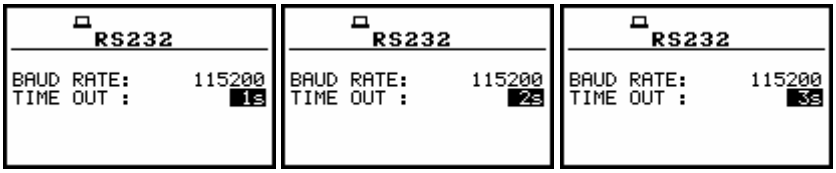
The other RS 232 transmission parameters are fixed to **8 bits for data**, **No parity** & **1 Stop bit**. The selected value has to be confirmed by pressing the **<ENTER>** push-button, which causes the simultaneous return to the **SETUP** list. All settings are ignored after the return to the **SETUP** list by pressing the **<ESC>** push-button.



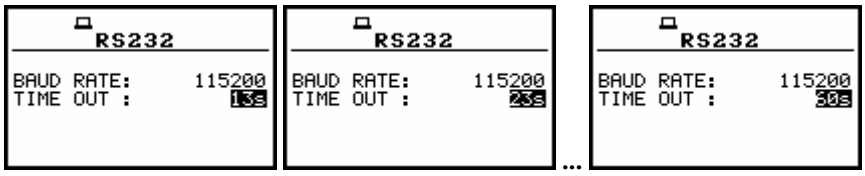
RS232 windows; the possible settings of the BAUD RATE

9.10.2 Setting time limit for the performance of serial interface operation - TIME OUT

The **TIME OUT** value shown in the inversely displayed line is increased or decreased by one with each pressing the **<🡄>**, **<🡆>** push-buttons. The step is increased / decreased to ten after pressing the **<🡄>**, **<🡆>** push-buttons together with the **<SHIFT>** one. The default value of this parameter is equal to one but it can be too short period for the printers, which are not too fast. In such case, the **TIME OUT** parameter has to be increased. The window is closed and the instrument returns to the **SETUP** list after pressing the **<ENTER>** (with the confirmation of all changes made in the window) or **<ESC>** push-buttons (ignoring all changes made there).



RS232 window; the setting of the TIME OUT with 1-second step



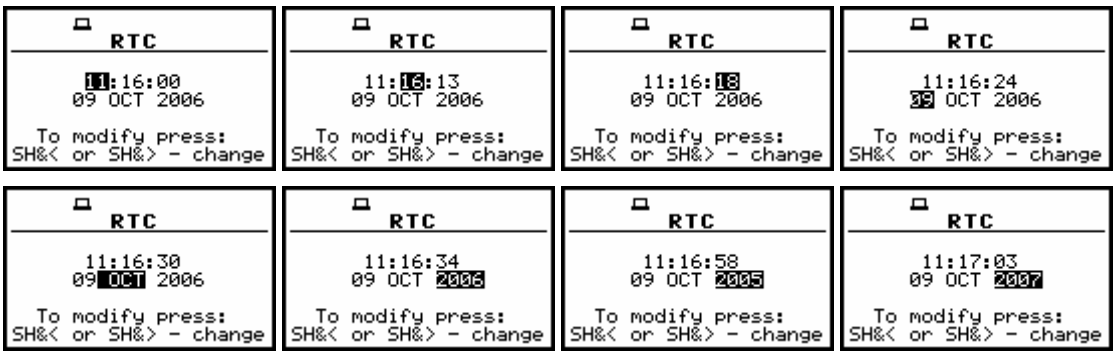
RS232 window; the setting of the TIME OUT with 10-seconds step

9.11 Programming the instrument's internal Real Time Clock - RTC

The **RTC** enables one to programme the internal **Real Time Clock**. This clock is displayed in the different places depending on the selected presentation mode. In order to enter the position the user has to select the **RTC** text in the **SETUP** list, using the **<🡅>**, **<🡇>** (or **<🡄>**, **<🡆>**) push-buttons and press the **<ENTER>** one.

SETUP list, the RTC text highlighted (displayed inversely)

The selection of the setting parameter (hour, minute, second, day, month and year) is performed using the **<◄>**, **<►>** push-buttons and the change of its value – using the **<◄>**, **<►>** push-buttons pressed together with the **<SHIFT>**.



RTC windows with the different parameters to be set

Notice: *The new value of a parameter is confirmed after each pressing of the* **<◄>** or **<►>** *together with the* ***<SHIFT>*** *push-buttons (new value is selected without any confirmation from the* ***<ENTER>*** *push-button).*

The window is closed and the instrument returns to the **SETUP** list after pressing the **<ENTER>** or **<ESC>** push-button.

9.12 Selection of few push-buttons mode - SHIFT MODE

The **SHIFT MODE** enables the user to programme the operation mode of the **<SHIFT>**, **<ALT>** and **<START / STOP>** push-buttons.

In order to enter the position the user has to select the **SHIFT MODE** text in the **SETUP** list, using the **<▲>**, **<▼>** (or **<◄>**, **<►>**) push-buttons and press the **<ENTER>** one. The selection of a parameter in both positions is done by means of the **<◄>**, **<►>** push-buttons and confirmed by the **<ENTER>** one. Any changes made in the window are not confirmed in the case of pressing the **<ESC>** push-button but the window is closed.

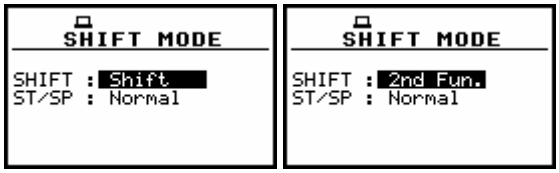
SETUP list, the SHIFT MODE text highlighted (displayed inversely)

9.12.1 <SHIFT> / <ALT> push-button working mode selection - SHIFT

In the **SHIFT**, the user can choose between **2nd Fun.** and **Shift**. When the **Shift** text is selected, the **<SHIFT>** and **<ALT>** push-buttons operates as in the keyboard of a computer – in order to achieve the desired result, the second push-button has to be pressed in conjunction with the **<SHIFT>/<ALT>** one. When the **2nd Fun.** text is selected the **<SHIFT>/<ALT>** push-button operates in the sequence with the other one.

In order to select a desired mode of the **<SHIFT>** push-button the **<◄>**, **<►>** should be pressed. In order to confirm the selection the **<ENTER>** push-button has to be pressed. Such pressing closes

the sub-list. After pressing the **<ESC>** push-button the sub-list is also closed but all changes, which were made, are ignored.



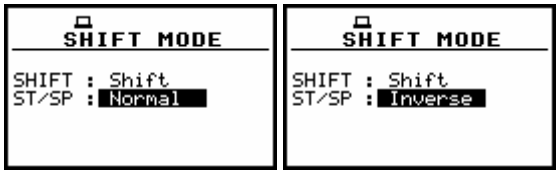
SHIFT MODE windows; the available SHIFT settings

9.12.2 <START / STOP> push-button working mode selection - ST/SP

In the **ST/SP** the user can choose between **Normal** and **Inverse**. When the **Normal** text is selected the instrument reacts on each of the **<START / STOP>** push-button pressing, starting or stopping the measurements.

When the **Inverse** text is selected the **<START / STOP>** push-button operates in conjunction or in a sequence with the **<SHIFT>** one. The measurements are started or stopped after pressing both push-buttons.

In order to select a desired mode of the **<START / STOP>** push-button the **<🡄>**, **<🡆>** should be pressed. In order to confirm the selection the **<ENTER>** push-button has to be pressed. Such pressing closes the sub-list. After pressing the **<ESC>** push-button the sub-list is also closed but all changes, which were made, are ignored.

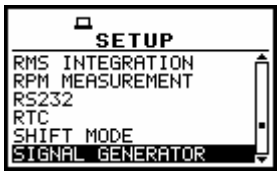


SHIFT MODE windows; the available ST/SP settings

9.13 Activation of the signal generation option - SIGNAL GENERATOR

The **SIGNAL GENERATOR** position enables the user to activate the built-in signal generator. This function is under development.

In order to enter the sub-list the user has to select the **SIGNAL GENERATOR** text in the **SETUP** list, using the **<🡅>**, **<🡇>** (or **<🡄>**, **<🡆>**) push-buttons and press the **<ENTER>** one.



SETUP list, the SIGNAL GENERATOR selected (highlighted inversely)

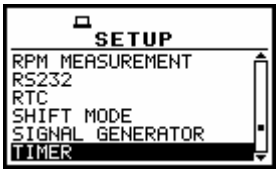
Display in the opened SIGNAL GENERATOR window

9.14 Programming the instrument's internal timer - TIMER

The **TIMER** enables one to programme the internal timer. The instrument can be switched on by itself in the programmed time and it can perform the measurements using the setup, which was used before its switching off.

The selection of the parameter to be set is performed using the **<▲>**, **<▼>** and the change of its value – using the **<◄>**, **<►>** push-buttons pressed together with the **<SHIFT>**.

In order to enter the position the user has to select the **TIMER** text in the **SETUP** list (using the **<▲>**, **<▼>** or **<◄>**, **<►>** push-buttons) and press the **<ENTER>** one.



SETUP list, the TIMER text highlighted (displayed inversely)

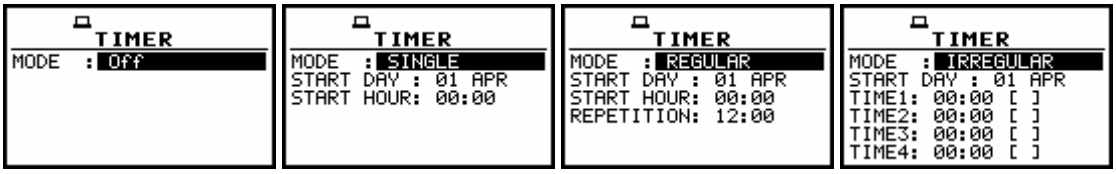
9.14.1 Selecting the mode of the timer function - MODE

The **MODE** of the timer function is selected pressing the **<◄>**, **<►>** push-buttons when the **MODE** text is displayed inversely in the **TIMER** sub-list.

The timer can be switched off – **Off**, switched on only once – **SINGLE**, switched on many times regularly – **REGULAR** with the period between two consecutive measurements set in the **REPETITION** line or switched on up to four times, not regularly – **IRREGULAR** in the time set in the **TIMEx** positions.

The selected value has to be confirmed by pressing the **<ENTER>** push-button, which causes the simultaneous return to the **SETUP** list. All settings are ignored after the return to the **SETUP** list by pressing the **<ESC>** push-button.

In the case the timer function is active (**SINGLE**, **REGULAR** or **IRREGULAR**) the clock icon starts blinking up to switching timer function off or up to finishing programmed measurements.



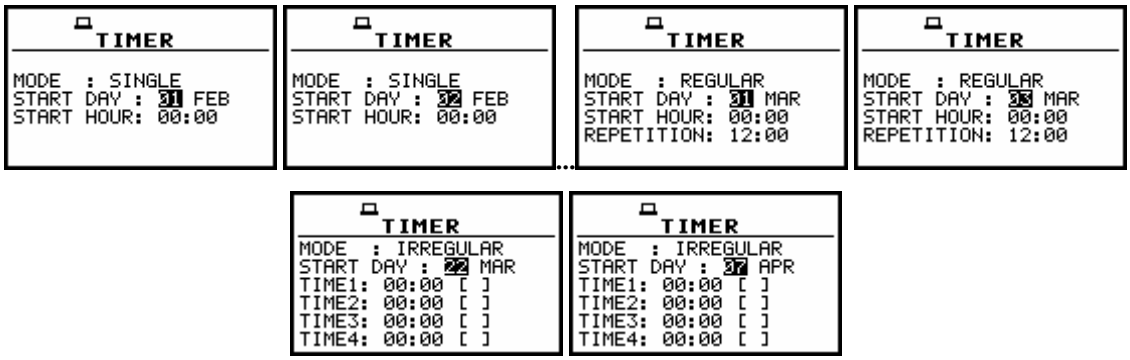
TIMER windows; the mode selection

9.14.2 Setting day of the instrument's switch on - START DAY

The **START DAY** determines the date of the measurement start. The timer can be programmed up to one month ahead and during the date setting the current state of the **R**eal **T**ime **C**lock is taken into account.

The required date can be selected pressing the **<◄>**, **<►>** push-buttons when the **START DAY** text is displayed inversely in the **TIMER** sub-list.

The selected value has to be confirmed by pressing the **<ENTER>** push-button, which causes the simultaneous return to the **SETUP** list. All settings are ignored after the return to the **SETUP** list by pressing the **<ESC>** push-button.

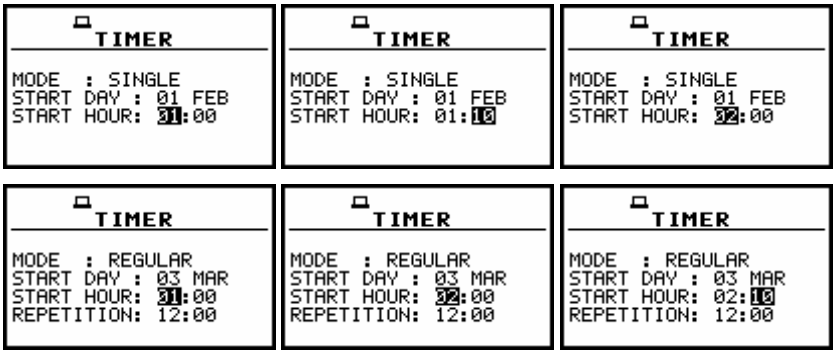


TIMER windows; setting day of the instrument's switch on

9.14.3 Setting hour of the instrument's switch on - START HOUR

The **START HOUR** determines hour of the measurement start. The required hour can be selected pressing the **<<>**, **<>>** push-buttons when the **START HOUR** text is displayed inversely in the **TIMER** sub-list.

In order to set minutes one has to enter their position pressing the **<^>**, **<v>** pushbuttons and then pressing the **<<>**, **<>>** push-buttons to select the proper value. The selected value has to be confirmed by pressing the **<ENTER>** push-button, which causes the simultaneous return to the **SETUP** list. All settings are ignored after the return to the **SETUP** list by pressing the **<ESC>** push-button.



TIMER windows; setting hour and minute of the instrument's switch on

9.14.4 Selecting the start hours for four irregular automatic measurements - TIMEx

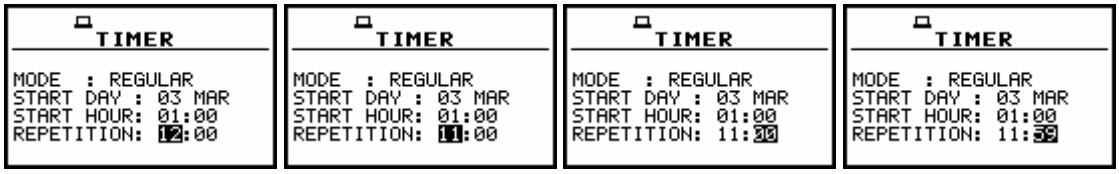
The **TIMEx** (**TIME1**, **TIME2**, **TIME3**, **TIME4**) is used to determine four irregular automatic starts of the measurements. The required hour can be selected pressing the **<<>**, **<>>** push-buttons when the **TIMEx** text is displayed inversely in the **TIMER** sub-list (mode **IRREGULAR**).

In order to set minutes one has to enter the proper line pressing the **<^>**, **<v>** push-buttons and then pressing the **<<>**, **<>>** push-buttons to select the proper value. The selected value has to be confirmed by pressing the **<ENTER>** push-button, which causes the simultaneous return to the **SETUP** list. All settings are ignored after the return to the **SETUP** list by pressing the **<ESC>** push-button.

9.14.5 Selecting the period between two consecutive measurements - REPETITION

The **REPETITION** of the timer function is selected pressing the **<<>**, **<>>** push-buttons when the **REPETITION** text is displayed inversely in the **TIMER** sub-list (mode **REGULAR)**. This parameter can be programmed from **00:00** up to **99:59**.

In order to set the proper value one has to select hours or minutes pressing the **<▲>**, **<▼>** push-buttons and then, pressing the **<◄>**, **<►>** push-buttons, to select the proper value. The selected value has to be confirmed by pressing the **<ENTER>** push-button, which causes the simultaneous return to the **SETUP** list. All settings are ignored after the return to the **SETUP** list by pressing the **<ESC>** push-button.

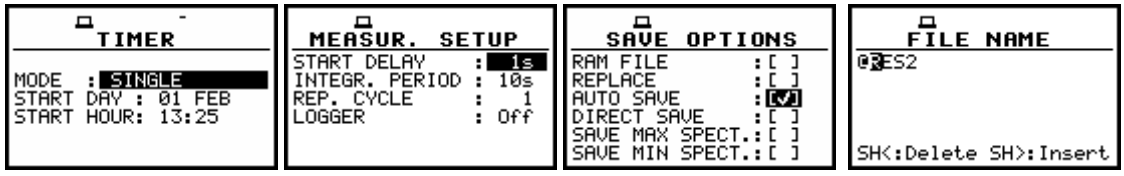


TIMER windows; setting REPETITION parameter

9.14.6 Description of the exemplary timer function execution

The **TIMER** function is used to programme the instrument's switch on at the given time and perform the measurements with the parameters set in the **INPUT** sub-list. Let us assume that the user wants to switch on the instrument the 1st of February, at 13:25, measure vibration during 10 seconds without using logger and save the results in a file @RES2.

In order to do this the user has to set the parameters of the **TIMER** function (*path: MENU / SETUP / TIMER*), the measurement parameters (*path: MENU / INPUT / MEASUREMENT SETUP*), activate the **AUTO SAVE** function (*path: MENU / FILE / SAVE OPTIONS*), name the file (the **FILE NAME** window is opened after switching on the **AUTO SAVE** function) and finally – switch off the instrument.

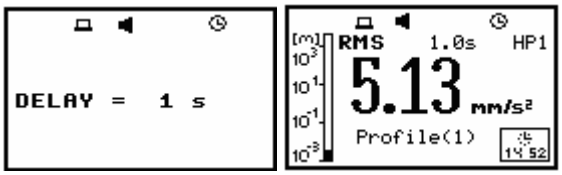


Exemplary settings made for the desired execution of the TIMER function

The instrument will be switched on the 1st of February at 13:25 and will be warmed up for the period of 60 seconds decrementing by one after each second the counter visible on the display.

Counting down during the warming up of the instrument after switching it on

After warming up the instrument and the preset **DELAY** time, the measurements are performed for a period of ten seconds. Then, the results are saved in the file which name was given or accepted (the proper information is displayed) and finally – the instrument is switched off.



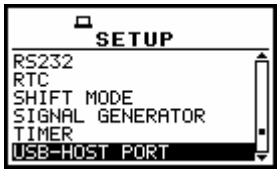
Displays during the executing of the TIMER function (timer icon is active)

***Notice: The instrument's TIMER function can be used for multiply measurements** (at the programmed day and time with the selected repetition). The first switch on of the instrument **must** be within one month ahead.*

9.15 Selection the USB–HOST port functionality - USB–HOST PORT

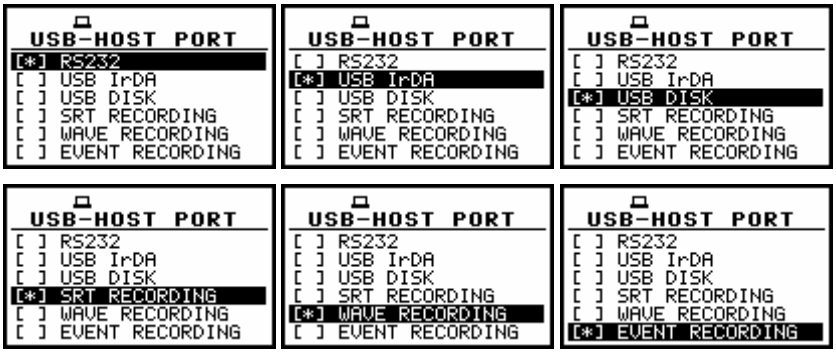
The **USB–HOST PORT** enables one to programme the functionality of the instrument's socket named **USB Host**.

In order to enter the position the user has to select the **USB–HOST PORT** text in the **SETUP** list, using the **<▲>**, **<▼>** (or **<◄>**, **<►>**) push-buttons and press the **<ENTER>** one.



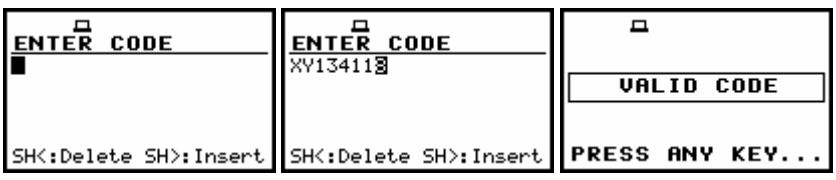
SETUP list, the USB–HOST PORT text highlighted (displayed inversely)

The socket **USB Host** can be used to serve as the input of the different interfaces: **RS 232** or **USB**. The **RS 232** interface in the **SVAN 95x** instrument is available as a hardware option (a special interface, named as the **SV 55**, with a dedicated microprocessor has to be attached to the socket **USB Host**). The RS232 is the default setting in this window. Only in this option the USB host controller is awaken and the power consumption is the lower one. An error occurs in the case of the connection to the socket the peripheral device of the different type than the selected one.



Displays in the USB–HOST PORT

The selection of the socket's functionality is made with the **<▲>**, **<▼>** (or **<◄>**, **<►>**) push-buttons which moves the special character between the available options. The selection is confirmed after pressing the **<ENTER>** push-button which closes the window and returns to the **SETUP** list. The return to this list is also possible after pressing the **<ESC>** push-button but the selection is not confirmed. In order to activate **IrDA**, **SRT RECORDING**, **WAVE RECORDING** or **EVENT RECORDING** the user has to introduce a special code.



Displays during the entering of the access code to SRT RECORDING, WAVE RECORDING or EVENT RECORDING

The USB host interface can be used to control the external USB memory disk (**USB DISK**, **SRT RECORDING**, **WAVE RECORDING**, **EVENT RECORDING**) with the FAT16 or FAT32 file systems or **IrDA** (**I**nfra**r**ed **D**ata **A**ssociation) interface (**USB IrDA**) based on the dedicated circuit STIr4200.

Notice: *The converter **SV 55** serves as the RS 232 interface. The **SV 55** connection to the **USB Host** socket is detected and after successful detection the headphone icon is switched on. The transmission using the **SV 55** is possible only in the case when the instrument is not connected to a PC with the **USB Device** port.*

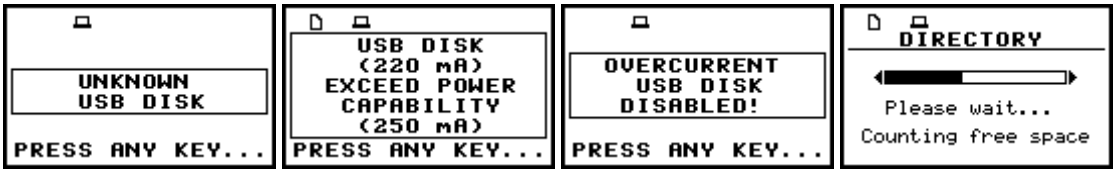
Notice: *The connection to the **USB Host** socket the USB disk switches off the instrument's internal flash memory. All file functions and remote commands are redirected to the USB disk. The internal flash memory is activated after disconnecting USB disk and the instrument.*

After the **USB DISK**, **SRT RECORDING**, **WAVE RECORDING** or **EVENT RECORDING** selection, the device connected to that socket is recognised. The warning appears on the display after the connection of the unknown device.

In the case, the device declares the current consumption greater than 200 mA the dedicated warning is presented.

In the case, the current consumption is greater than 250 mA the connected USB disk is switched off and special warning is displayed.

In other cases, the connected USB disk is initiated and the free space is determined.



Displays with the different USB disk warnings

This operation can last up to few minutes depending on the disk's capacity. The detection of the **USB DISK** is signalised by the paper sheet icon (at the display's left corner). Next, the file's directory should be determined (*path: MENU / FILE / DIRECTORY*). This directory can be created in the instrument or already existing one in the disk is selected.

The **FREE SPACE** denotes the available free memory on the connected disk.

The **DIR NO.** shows the number of the selected directory (the 1st number) and the number of the existing directories (the 2nd number). In the case the directories do not exist, these numbers are equal to zero.

The **DIR NAME** enables one to edit the directory name (the 1st number) or displays its name. The help lines are placed at the display's bottom.

There are two ways of the current directory selection:

- the name edition in the **DIR NAME** line. The default name consists of the day number and the month abbreviation. The not existing directory will be created.
- the selection of the existing directory by means of the **<<>**, **<>>** push-buttons pressed in the line with the **DIR NO.** text. The name of the selected directory is displayed in the **DIR NAME** line.

The selection is confirmed after pressing the **<ENTER>** push-button which closes the window and returns to the **FILE** list. The return to this list is also possible after pressing the **<ESC>** push-button but the

selection is not confirmed. The selection of the directory is obligatory during the initialisation process. In this case also the **<ESC>** push-button confirms the settings.

Contents of the DIRECTORY window

In the case of the **TIMER** function, the directory selection is skipped and the default one is created.

The usage of the USB disk modifies a few windows and lists. First of all, the described above **DIRECTORY** window and **COPY FILES TO USB**, **MOVE FILES TO USB** windows appear in the **FILE** list. Additionally, in some places concerning the file management the info about the name of the current USB disk directory is displayed in the upper line: *DIRECTORY: the name of the current directory.*

These places are as follows: *DISPLAY / LOGGER VIEW, FILE / LOAD, FILE / DELETE / RESULT FILES, FILE / DELETE / LOGGER FILES, FILE / DELETE / SETUP FILES, FILE / CATALOGUE, FILE / LOAD SETUP*.

The usage of the USB disk modifies also the execution of a few functions, namely:

- the **DEFRAGMENTATON** is not executed,
- the REAL TIME transmission is stopped,
- the remote file writing using the #9 function is not available
- in the **FILE** / **FREE SPACE** window the free space and the total capacity of the USB disk are given,
- in the file report the name of the current directory of the USB disk is added,
- the USB disk memory is not divided between the files and the logger, so the free space concerns both: logger and file memory.

The USB disk can be disconnected when the measurements are not performed and the results are presented. The internal instrument's flash memory is initialised after switching off the USB disk.

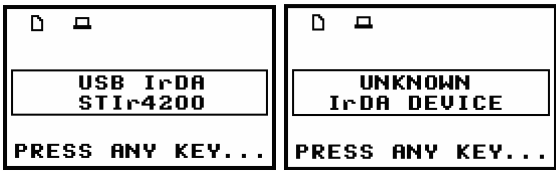
In the USB disk that is divided into partitions its first partition has to serve FAT32 or FAT16 file system. Only short name file (up to 8 characters, similar to DOS system) is implemented. The existing longer names are shortened.

Notice: *The disconnection of the USB disk during the data transmission can cause the lost of data saved in the USB disk as well as in the instrument's internal flash.*

The IrDA is the wireless interface used for the communication between the instrument and a PC. The connection of the IrDA converter results in displaying the info window and switching on the paper sheet icon (at the left side of the upper line).

In the case of the unsuitable settings in the **USB HOST PORT** window or connecting wrong device another info window is displayed.

The transmission parameters are selected automatically during the negotiation process. The fastest available speed equals to 115 200 kb/s. In this case, the real speed is not bigger than 1.5 kB/s. The IrDA programming is based on a virtual COM port emulation in a PC.

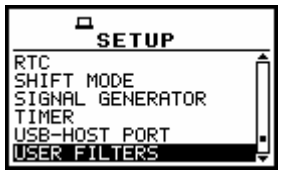


Displays during the IrDA interface connection

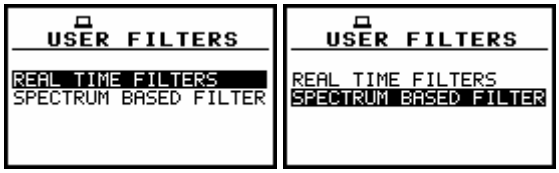
9.16 Setting the coefficients of the user filters - USER FILTERS

The **USER FILTERS** position enables the user to introduce the values of the coefficients of the user filters.

In order to enter the position the user has to select the **USER FILTERS** text in the **SETUP** list, using the **<▲>**, **<▼>** (or **<◄>**, **<►>**) push-buttons and press the **<ENTER>**. The **USER FILTERS** sub-list contains two positions: **REAL TIME FILTERS** and **SPECTRUM BASED FILTERS.**



SETUP list, the USER FILTERS text highlighted (displayed inversely)



USER FILTERS windows, REAL TIME FILTERS selected (a), SPECTRUM BASED FILTERS selected (b)

9.16.1 Introduction the parameters of real time filters - REAL TIME FILTERS

The **REAL TIME FILTERS** sub-list enables the user to introduce the values of the correcting coefficients taken into account in the **real time measurements**.

In order to enter this sub-list the user has to select the **REAL TIME FILTERS** text in the **USER FILTERS** list, using the **<▲>**, **<▼>** (or **<◄>**, **<►>**) push-buttons and press the **<ENTER>**. After pressing **<ENTER>** push-button the window for entering the access code to an option is opened (in the first essay of its execution).

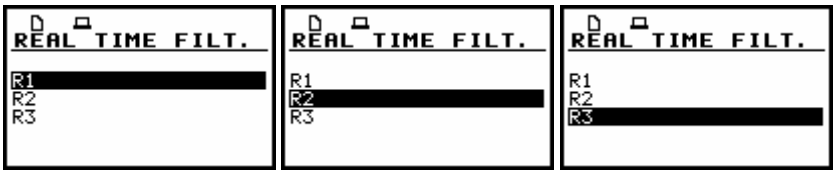
The **REAL TIME FILTERS** (sub-list) contains 3 positions: **R1**, **R2**, **R3**.

USER FILTERS windows, REAL TIME FILTERS selected

Displays during the entering of the access code to REAL TIME FILTERS

9.16.1.1 Selecting real time filter - Rx

The selection of the filter is made by means of the **<▲>**, **<▼>** (or **<◄>**, **<►>**) push-buttons. The confirmation is made after pressing **<ENTER>** push button. The return to the **USER FILTERS** window ignoring any changes made in the sub-list is made after pressing the **<ESC>** push-button.

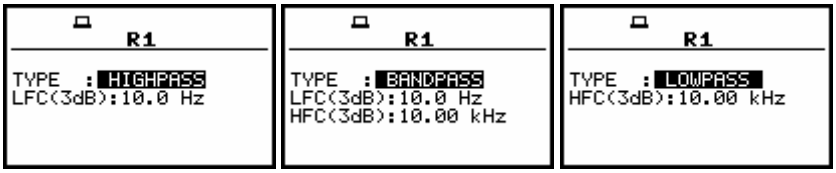


REAL TIME FILTERS windows, the filter selection

In **Rx** (**R1**, **R2**, **R3**) window there are three positions: **TYPE**, **LFC(3dB)**, **HFC(3dB)**. The selection of the position is made by means of **<▲>**, **<▼>** push-buttons.

In order to confirm the selection the user has to press **<ENTER>** push button.

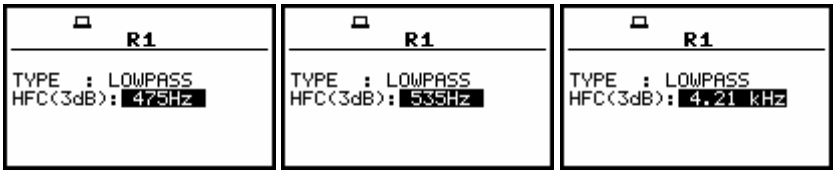
In the **TYPE** position there are three options: **HIGHPASS**, **BANDPASS** and **LOWPASS** denoting the type of the digital filter, which has to be designed and implemented. All mentioned above filters, high-pass, band-pass and low-pass, are the second order, which means that the slope is equal to 12 dB/octave. The selection of the option is made with **<◄>**, **<►>** push-buttons. The confirmation is made after pressing **<ENTER>** push-button. The return to the **REAL TIME FILTERS** list ignoring any changes made in the sub-list is made after pressing the **<ESC>** push-button.



R1 filter windows, the TYPE selection

In the case of a low-pass filter the user has to determine the **HFC(3dB)** parameter which denotes the **HFC** (**H**igh **F**requency **C**orner) of the **Rx** filter at which the amplitude of the input signal is attenuated two times. The available values are from 100 Hz to 10.0 kHz.

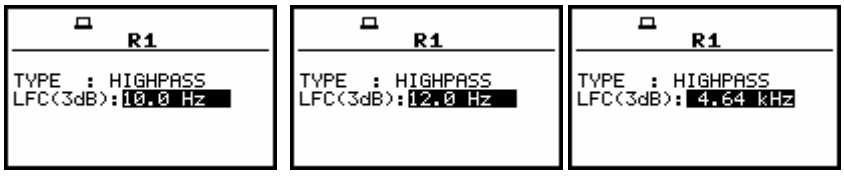
The selection of the required value is made with **<◄>**, **<►>** push-button (pressing **<◄>** or **<►>**push-button with the **<SHIFT>** one increases the step 20 times). The confirmation is made by pressing **<ENTER>.** The return to the **REAL TIME FILTERS** list ignoring any changes made in the sub-list is made after pressing the **<ESC>** push-button.



R1 filter windows, the HFC(3dB) selection for a LOWPASS filter

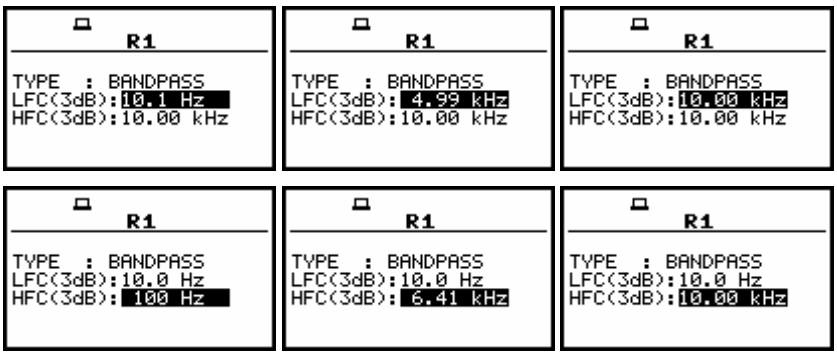
In the case of a high-pass filter the user has to determine the **LFC(3dB)** parameter, which denotes the **LFC** (**L**ow **F**requency **C**orner) of the **Rx** filter at which the amplitude of the input signal is attenuated two times. The available values of the **LFC** are from 10 Hz to 10.0 kHz.

The selection of the required value is made with **<◄>**, **<►>** push-button (pressing **<◄>** or **<►>**push-button with the **<SHIFT>** one increases the step 20 times). The confirmation is made by pressing **<ENTER>.** The return to the **REAL TIME FILTERS** list ignoring any changes made in the sub-list is made after pressing the **<ESC>** push-button.



R1 filter windows, the LFC(3dB) selection for a HIGHPASS filter

In the case of a band-pass filter, the user has to determine two frequencies: the **LFC(3dB)** which denotes the (**L**ow **F**requency **C**orner) and the **HFC(3dB)** of the **Rx** filter. At these frequencies, the amplitude of the input signal is attenuated two times. The available values of the **LFC** are from 10 Hz to 10.0 kHz, while the **HFC** the available values are from 100 Hz to 10.00 kHz. The selection of the parameter is made by pressing **<🡄>**, **<🡆>** push-buttons (pressing **<🡄>** or **<🡆>** push-button with the **<SHIFT>** one increases the step 20 times). The confirmation is made by pressing **<ENTER>**. The return to the **REAL TIME FILTERS** list ignoring any changes made in the sub-list is made after pressing the **<ESC>** push-button.

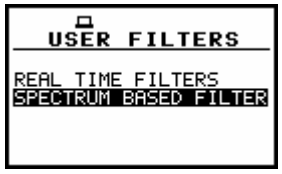


R1 filter windows, the LFC(3dB) selection and the HFC(3dB) selection for BANDPASS filter

9.16.2 Setting filter coefficients for octave analysis - SPECTRUM BASED FILTERS

The **SPECTRUM BASED FILTERS** sub-list enables the user to introduce the values of the filter coefficients correcting the results of **1/1 OCTAVE** or **1/3 OCTAVE** analysis. The results of the analysis (the TOTAL values) can be modified by the introduced factors.

In order to enter the sub-list the user has to select the **USER FILTERS** text in the **SETUP** list, using the **<🡅>**, **<🡇>** (or **<🡄>**, **<🡆>**) push-buttons and press the **<ENTER>**. The **USER FILTERS** (sub-list) contains 3 sub-lists: **VIEW**, **EDIT** and **CLEAR**.

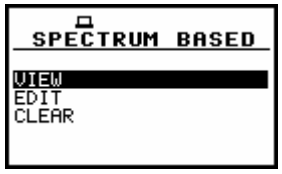


USER FILTERS windows, SPECTRUM BASED FILTERS selected

9.16.2.1 Looking at the coefficients of the user filters set - VIEW

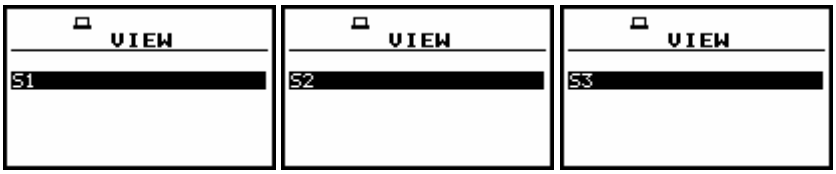
The **VIEW** sub-list enables one to look at the coefficients of the **USER FILTERS** sets saved in the instrument under the names **S1**, **S2**, **S3**. The coefficients can be set by the user in the instrument by means of the **EDIT** option or sent to it (together with the name) by means of the interface using **#6** function (cf. App. A for the description).

In order to enter the sub-list the user has to select in the **SPECTRUM BASED FILTER** sub-list the **VIEW** text, using the **<🡅>**, **<🡇>** (or **<🡄>**, **<🡆>**) push-buttons and press the **<ENTER>**. In the **VIEW** window one can select one of three mentioned above filters (**S1**, **S2** and **S3**). The selection of the filter in this sub-list is performed by means of the **<🡄>**, **<🡆>** push-buttons.



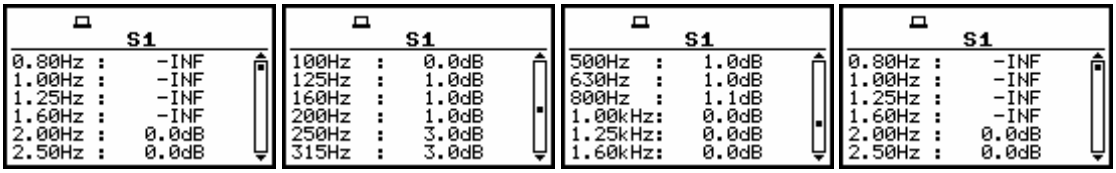
SPECTRUM BASED FILTERS window, the VIEW text highlighted

The sub-list is closed and the instrument returns to the **USER FILTERS** sub-list after pressing the **<ESC>** push-button (ignoring a change made in the position).



VIEW windows, the filter selection

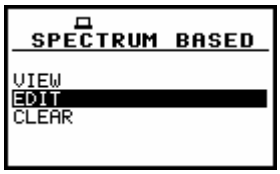
After pressing the **<ENTER>** push-button on the displayed inversely text the proper sub-list is opened containing the values of the coefficients for all **SPECTRUM BASED 1/1 OCTAVE** and **1/3 OCTAVE** filters. It is not possible to change the values. The selection of the displayed coefficients in the selected filter is performed by means of the **<▲>**, **<▼>** push-buttons.



S1 filter windows

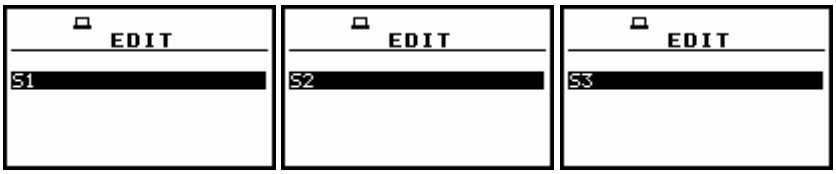
9.16.2.2 Setting the coefficients of the user filters set - EDIT

The **EDIT** sub-list enables the user to select which filters should be edited; the available options are as follows: **S1**, **S2**, **S3** or any other transmitted to the instrument from a PC by means of the interface. In order to enter the sub-list the user has to select the **EDIT** text in the **SPECTRUM BASED FILTER** sub-list, using the **<▲>**, **<▼>** (or **<◄>**, **<►>**) push-buttons and press the **<ENTER>**.



SPECTRUM BASED FILTERS window, the EDIT text highlighted

The selection of the position in this sub-list is performed by means of the **<◄>**, **<►>** push-buttons. After pressing the **<ENTER>** push-button when the **S1**, **S2**, **S3** or any other (in the **EDIT** window) text is displayed inversely, the sub-list containing the values of the coefficients for all **1/1 OCTAVE** and **1/3 OCTAVE** filters is opened.



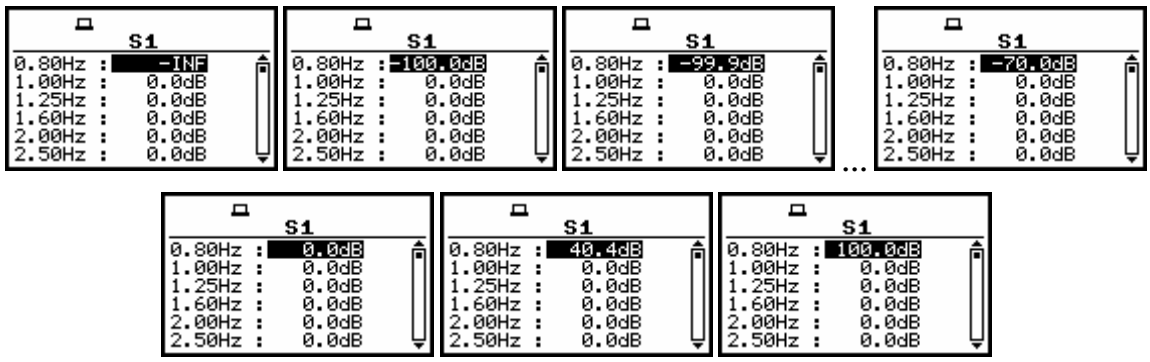
EDIT windows, the filter selection

The opened window contains the centre frequencies of the filters and their coefficients:

- **0.80 Hz:** available values of 0.8 Hz centre frequency filter: **-INF**, **-100.0dB ... 100.0dB**
- **1.00 Hz:** available values of 1Hz centre frequency filter: **-INF**,**-100.0dB ... 100.0dB**
-

- **...**
- **20.0kHz:** available values of 20 kHz centre frequency filter: **-INF**, **-100.0dB ... 100.0dB**

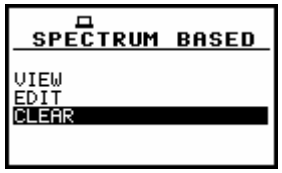
The selection of the position in the set is performed by means of the **<▲>**, **<▼>** push-buttons. The value is introduced by pressing the **<◄>**, **<►>** push-buttons. The sub-list is closed and the instrument returns to the **USER FILTERS** sub-list after pressing the **<ENTER>** (with the confirmation of all settings made in the sub-list) or **<ESC>** push-button (ignoring all settings made in the sub-list).



S1 filter windows; the coefficient selection

9.16.2.3 Clearing the coefficients of the user filters - CLEAR

The **CLEAR** position enables the user to clear the values of the user coefficients of octave or third octave filters. It is possible to clear all sets of coefficients (**ALL**), to clear the first set (**S1**), to clear the second set (**S2**), to clear the third one (**S3**) or any other transmitted to the instrument from a PC by means of the interface.

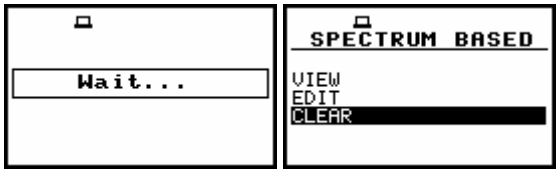


SPECTRUM BASED FILTER window; the CLEAR position selected

In order to enter the sub-list the user has to select in the **SPECTRUM BASED FILTER** sub-list the **CLEAR** text, using the **<▲>**, **<▼>** (or **<◄>**, **<►>**) push-buttons and press the **<ENTER>**. The selection of the position in this sub-list is performed by means of the **<◄>**, **<►>** push-buttons. The coefficients of a set (or sets) are cleared after the selection of the proper text by means of the **<◄>**, **<►>** push-buttons and after pressing the **<ENTER>** one.

CLEAR windows, the selection of the filters to be cleared

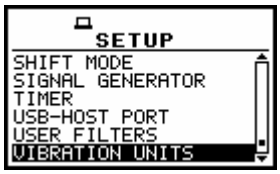
After this, the **WAIT** text appears on the display and the instrument returns to the **SPECTRUM BASED** window. The **CLEAR** sub-list is also closed and the instrument returns to the **SPECTRUM BASED** window after pressing the **<ESC>** push-button (without taking any action).



Displays during and after the execution of CLEAR operation

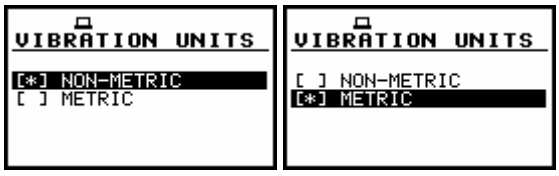
9.17 Selection of the vibration units - VIBRATION UNITS

The **VIBRATION UNITS** position enables the user to select the units for the vibration measurements. In order to enter the position the user has to select the **VIBRATION UNITS** text in the **SETUP** list, using the **<▲>**, **<▼>** (or **<◄>**, **<►>**) push-buttons and press the **<ENTER>**.



SETUP list, the VIBRATION UNITS text highlighted (displayed inversely)

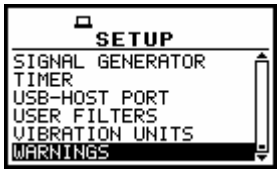
It is possible to select the **NON-METRIC** units (e.g. g, ips, mil etc.) or **METRIC** units (e.g. m/s^2, m/s, m etc.). The selection is done by means of the **<◄>**, **<►>** push-buttons. In order to confirm the selection the **<ENTER>** push-button has to be pressed. Such pressing closes the sub-list. After pressing the **<ESC>** push-button the sub-list is also closed but all changes, which were made, are ignored.



VIBRATION UNITS windows with the available positions

9.18 Warnings selection - WARNINGS

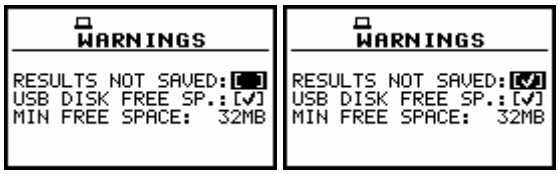
The **WARNINGS** enables the user to select the messages, which could be displayed during the operation of the instrument. In order to enter the window the user has to select the **WARNINGS** text in the **SETUP** list, using the **<▲>**, **<▼>** (or **<◄>**, **<►>**) push-buttons and press the **<ENTER>**. This window contains only one position.



SETUP list, the WARNINGS text highlighted (displayed inversely)

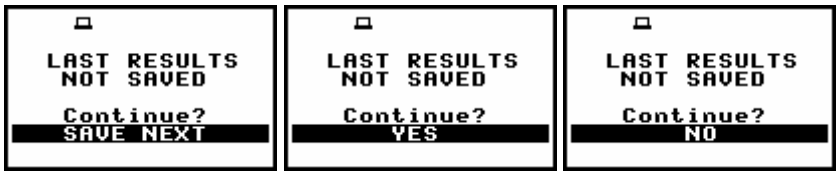
9.18.1 Saving the measurement results in a file - RESULTS NOT SAVED

In order to switch on the displaying of the message the user has to place, by means of the **<◄>**, **<►>** push-buttons, the special character in the warning's position. The window is closed and the instrument returns to the **SETUP** list after pressing the **<ENTER>** (with the confirmation of a change made in the position) or **<ESC>** push-button (ignoring a change made in the position).



WARNINGS windows; RESULTS NOT SAVED selected

When the position is set to be active the special warning can be displayed after pressing the **<START / STOP>** push-button. It will be happened in a case when the result of the previous measurement was not saved in a file of the instrument.

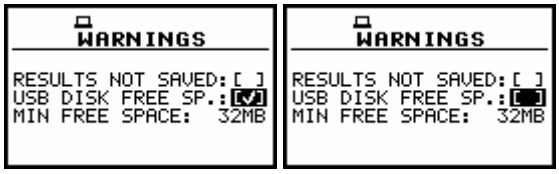


Displays with LAST RESULTS NOT SAVE warning

The question **Continue?** appears with the warning message. The default value of the **CONTINUE** position is **SAVE NEXT**. After pressing the **<ENTER>** push-button the instrument saves last results with the name number increased by one. Using the **<◄>**, **<►>** push-buttons one can change the value of the **CONTINUE** position to **YES** or **NO**. If **YES** is chosen (to confirm the change the **<ENTER>** should be pressed), the instrument returns to the active mode of result presentation starting the new measurement process. If **NO** is chosen (to confirm the change the **<ENTER>** should be pressed), the instrument returns to the active mode of measurement result's presentation without starting the new measurement process.

9.18.2 Checking free space on the USB disk - USB DISK FREE SP.

In order to switch on the displaying of the message the user has to place, by means of the **<◄>**, **<►>** push-buttons, the special character in the warning's position. The window is closed and the instrument returns to the **SETUP** list after pressing the **<ENTER>** (with the confirmation of a change made in the position) or **<ESC>** push-button (ignoring a change made in the position).



WARNINGS windows; USB DISK FREE SP. selected

9.18.3 Minimum USB disk memory free space setting - MIN FREE SPACE

In this line, the user can determine the amount of the USB disk memory free space.

WARNINGS windows; MIN FREE SPACE selection

The selected limit has to be within the range [1 MB, 1024 MB]. If the available memory is not greater than that limit, the warning will be displayed. The limit is set by means of the **<◄>**, **<►>** push-buttons with the step equal to one MB. The step is increased up to ten MB, pressing the **<◄>**, **<►>** push-buttons together with the **<SHIFT>** one. The window is closed and the instrument returns to the **SETUP** list after pressing the **<ENTER>** (with the confirmation of a change made in the position) or **<ESC>** push-button (ignoring a change made in the position).

The exemplary warning is presented below. The return to the programme execution is done after pressing any push-button except the **<SHIFT>** and **<ALT>**.

Display with USB DISK FREE SPACE warning