

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 **<^>**, **<v>** (or **<<>**, **>>>**) push-buttons the **INPUT** text and finally pressing the **<ENTER>** one.



Main list with INPUT text selected

The **INPUT** list in the **LEVEL METER** contains the elements that enable one:

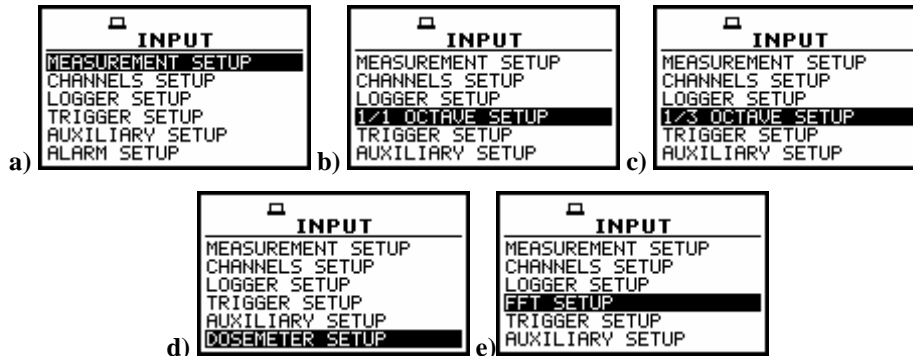
- the independent programming of the measurement parameters (**MEASUREMENT SETUP**),
- settings in channels (**CHANNELS SETUP**),
- settings in logger (**LOGGER SETUP**),
- trigger function (**TRIGGER SETUP**) and
- auxiliary functions (**AUXILIARY SETUP**).

In the case of **1/1 OCTAVE** and **1/3 OCTAVE**, on the display appears **1/1 OCTAVE SETUP** or **1/3 OCTAVE SETUP** position.


In the case of the **DOSE METER** function selected, there is **DOSEMETER SETUP** position.

In the case of **FFT analyser**, on the display appears **FFT SETUP** position.

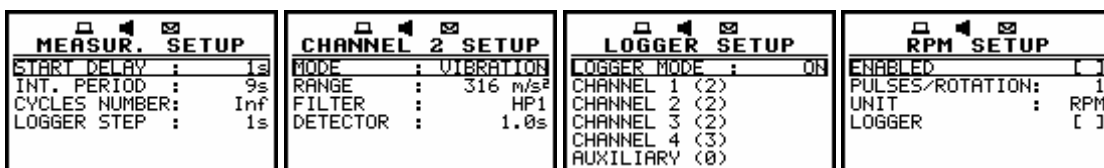
In the case of **RT60** function, the special position appears in the **SETUP** list.



INPUT list in LEVEL METER (a), in 1/1 OCTAVE analyser (b), 1/3 OCTAVE analyser (c), in DOSE METER (d) and in FFT analyser (e)



Notice: The user can change any parameter in the **INPUT** list only when the **instrument does not execute a measurement**. Parameter's field, which is displayed inversely, signals the possibility of a change. Moreover, the parameter in the frame means that it cannot be changed. The **“Loudspeaker” icon** indicates that the **instrument is performing the measurements**.



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



Notice: In the case of settings for vibration measurements, the parameters can be presented in LOGARITHMIC (decibels) or LINEAR (m/s^2) units. It depends on the **DISPLAY SCALE** setting (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, namely:

- delay of the start of measurements (**START DELAY**), the integration period (**INT. PERIOD**),
- number of the measurement cycles (**CYCLES NUMBER**) and
- logging period (**LOGGER STEP**).

The selection of the line with the parameter to be changed is made with <▲>, <▼> push-buttons. The selection of the required parameter value is made with <◀>, <▶> 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.

| MEASUR. SETUP | MEASUR. SETUP | MEASUR. SETUP | MEASUR. SETUP |
|--------------------|--------------------|--------------------|--------------------|
| START DELAY : 1s | START DELAY : 1s | START DELAY : 1s | START DELAY : 1s |
| INT. PERIOD : 10s | INT. PERIOD : 10s | INT. PERIOD : 1s | INT. PERIOD : 10s |
| CYCLES NUMBER: Inf | CYCLES NUMBER: Inf | CYCLES NUMBER: Inf | CYCLES NUMBER: Inf |
| LOGGER STEP : 1s | LOGGER STEP : 1s | LOGGER STEP : 1s | LOGGER STEP : 1s |

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).

The delay period can be set from **0 second** to **60 seconds** with 1-second step (by means of the <◀>, <▶> push-buttons) or 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.

| MEASUR. SETUP | MEASUR. SETUP | MEASUR. SETUP |
|--------------------|--------------------|--------------------|
| START DELAY : 1s | START DELAY : 2s | START DELAY : 3s |
| INT. PERIOD : 10s | INT. PERIOD : 10s | INT. PERIOD : 10s |
| CYCLES NUMBER: Inf | CYCLES NUMBER: Inf | CYCLES NUMBER: Inf |
| LOGGER STEP : 1s | LOGGER STEP : 1s | LOGGER STEP : 1s |

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

| MEASUR. SETUP | MEASUR. SETUP | MEASUR. SETUP |
|--------------------|--------------------|--------------------|
| START DELAY : 3s | START DELAY : 13s | START DELAY : 23s |
| INT. PERIOD : 10s | INT. PERIOD : 10s | INT. PERIOD : 10s |
| CYCLES NUMBER: Inf | CYCLES NUMBER: Inf | CYCLES NUMBER: Inf |
| LOGGER STEP : 1s | LOGGER STEP : 1s | LOGGER STEP : 1s |

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



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

5.1.2 Setting integration period - INT. PERIOD

The **INT. PERIOD** defines the period in which the signal is being averaged during the measurements (cf. App. D for the definitions of the measurement results and integration period). The required value of this parameter can be set by means of the <<<, >>> (or by pressing the <<< or >>> with <SHIFT> push- buttons) and confirmed by the <ENTER> push-button:

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

| MEASUR. SETUP | MEASUR. SETUP | MEASUR. SETUP |
|--------------------|--------------------|--------------------|
| START DELAY : 1s | START DELAY : 1s | START DELAY : 1s |
| INT. PERIOD : 1s | INT. PERIOD : 2s | INT. PERIOD : 3s |
| CYCLES NUMBER: Inf | CYCLES NUMBER: Inf | CYCLES NUMBER: Inf |
| LOGGER STEP : 1s | LOGGER STEP : 1s | LOGGER STEP : 1s |

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

| MEASUR. SETUP | MEASUR. SETUP | MEASUR. SETUP |
|--------------------|--------------------|--------------------|
| START DELAY : 1s | START DELAY : 1s | START DELAY : 1s |
| INT. PERIOD : 3s | INT. PERIOD : 13s | INT. PERIOD : 23s |
| CYCLES NUMBER: Inf | CYCLES NUMBER: Inf | CYCLES NUMBER: Inf |
| LOGGER STEP : 1s | LOGGER STEP : 1s | LOGGER STEP : 1s |

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

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

| MEASUR. SETUP | MEASUR. SETUP | MEASUR. SETUP | MEASUR. SETUP |
|--------------------|--------------------|--------------------|--------------------|
| START DELAY : 1s | START DELAY : 1s | START DELAY : 1s | START DELAY : 1s |
| INT. PERIOD : 1m | INT. PERIOD : 2m | INT. PERIOD : 4m | INT. PERIOD : 14m |
| CYCLES NUMBER: Inf | CYCLES NUMBER: Inf | CYCLES NUMBER: Inf | CYCLES NUMBER: Inf |
| LOGGER STEP : 1s | LOGGER STEP : 1s | LOGGER STEP : 1s | LOGGER STEP : 1s |

MEASUREMENT SETUP windows; the setting of INT. 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.

| MEASUR. SETUP | MEASUR. SETUP | MEASUR. SETUP | MEASUR. SETUP |
|--------------------|--------------------|--------------------|--------------------|
| START DELAY : 1s | START DELAY : 1s | START DELAY : 1s | START DELAY : 1s |
| INT. PERIOD : 2h | INT. PERIOD : 3h | INT. PERIOD : 4h | INT. PERIOD : 14h |
| CYCLES NUMBER: Inf | CYCLES NUMBER: Inf | CYCLES NUMBER: Inf | CYCLES NUMBER: Inf |
| LOGGER STEP : 1s | LOGGER STEP : 1s | LOGGER STEP : 1s | LOGGER STEP : 1s |

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



Notice: In the case of switching on **AUTO SAVE** function, the minimum value of the integration period should be equal to 25 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 equal or greater than 25 seconds. When **AUTO SAVE** option was switched on and new entered integration period value is less than 25 seconds, **AUTO SAVE** option switches off and **AUTO SAVE DISABLED / INTEGRATION PERIOD TOO SHORT** message appears on the display.

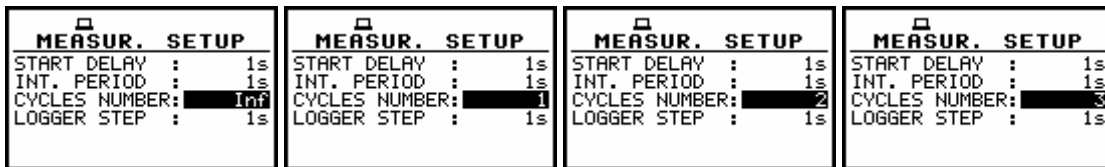


Display, when the **INTEGRATION PERIOD** is too short for **AUTO SAVE** option

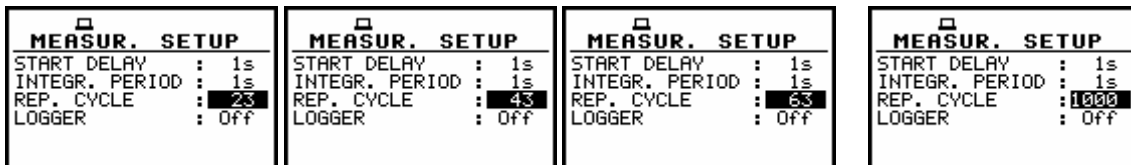
5.1.3 Setting the number of repetition of measurement cycles - CYCLES NUMBER

The **CYCLES NUMBER** defines the number of cycles (with the measurement period defined in the **INT. 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 pressing the <START / STOP> push-button or after receiving the remote control code). The **REP. CYCLE** number values are within the limits [1, 1000].



CYCLES NUMBER setting with the step equal to one

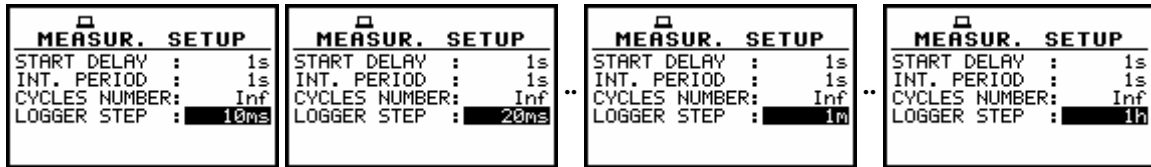


CYCLES NUMBER setting with the step equal to 20

5.1.4 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 **10 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.

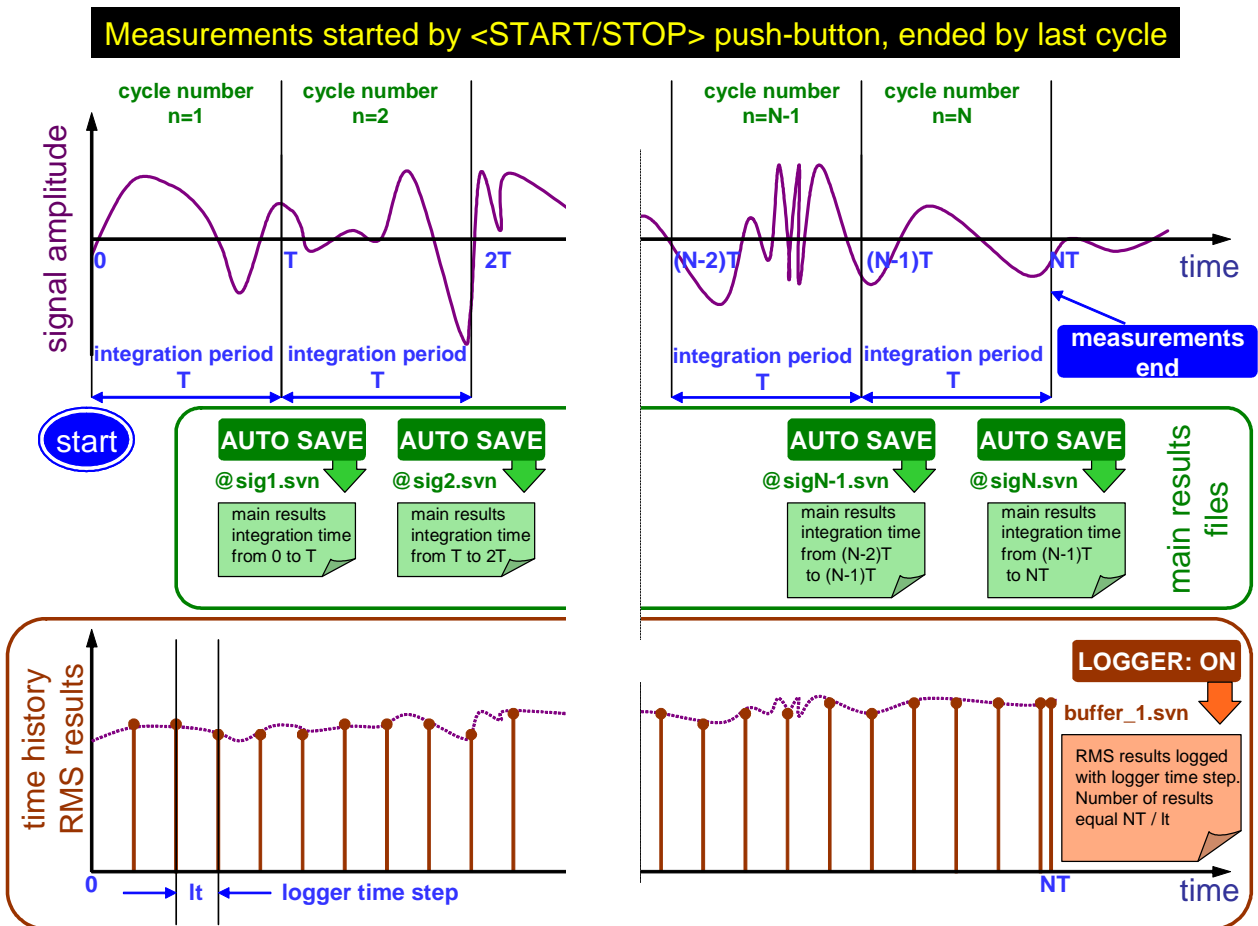
The required parameter can be set by means of the <<>, <>> push-buttons with the single step and by means of the <<>, <>> with <SHIFT> with the incremented one. The selection is accepted by the <ENTER> one, which closes simultaneously the **MEASUREMENT SETUP** window. Any changes are ignored after pressing the <ESC> push-button.



MEASUR. SETUP windows, LOGGER STEP selection

The main measurement results (depending on the sound or vibration mode measurements) can be saved in the result files of the instrument's memory by means of the **SAVE** or **AUTO NAME** function (*path: MENU / FILE / SAVE*). The structure of the files is described in App. B. In the case when the **INT. 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 **CYCLES NUMBER** is greater than one, the **AUTO SAVE** operation will be performed after the period set in the **INT. 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**. During sound measurements, from each profile of the channel, the user can select up to four results (**PEAK / MAX / MIN / RMS**) to be logged with logger step down to 10 ms. So, up to 48 results can be logged simultaneously from four channels of the instrument and from each profile (*path: MENU / INPUT / PROFILE y, where y = 1, 2 and 3*).



Relations between INTEGR. PERIOD and LOGGER STEP

During vibration measurements, from each channel, the user can select up to five results. (**PEAK / P-P / MAX / RMS / VDV**). Additionally, two **AUXILIARY** results can be also logged in this mode, namely **VECTOR** and **RPM**. So, up to 22 results can be logged simultaneously from four channels of the instrument. These results are saved in one logger's file of the instrument's memory in the **SOUND** or **VIBRATION LEVEL METER** as well as for other functions. The name of the file is predefined. The registration in the logger's memory is stopped after the period, which is equal to **INT. PERIOD** multiplied by **CYCLES NUMBER**, after pressing the **<START/STOP>** or after stopping the measurements remotely.

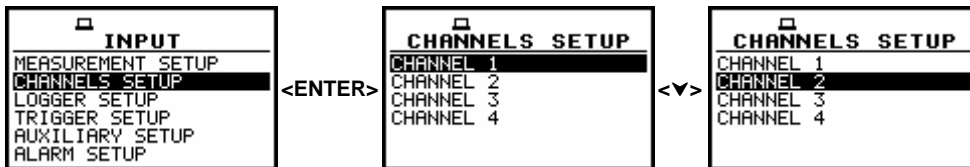
5.2 Setting parameters in channels - CHANNELS SETUP

The user enters the **CHANNELS SETUP** after pressing the **<ENTER>** push-button on the displayed inversely **CHANNELS SETUP** text, which has to be selected by means of the **<▲>**, **<▼>**. In the **CHANNELS SETUP** window the user has to select channel number (**CHANNEL x**) using **<▲>**, **<▼>** push-buttons and press **<ENTER>**.

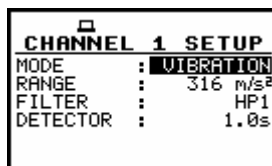
In the **CHANNEL x** sub-list the following parameters can be programmed independently for each channel: **MODE (SOUND or VIBRATION)** and measurement range (**RANGE**).

In the case of vibration mode, the user can select weighting filter (**FILTER**) and detector time constant (**DETECTOR**).

In the case of sound mode, it is possible to set parameters for microphone (**MICROPHONE CORRECTION**) and to set parameters in profiles (**PROFILE y**).



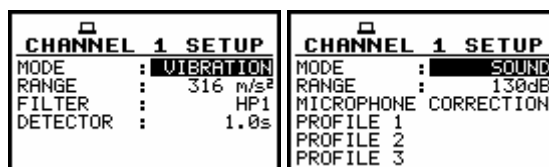
INPUT list with CHANNELS SETUP selected and channel selection



CHANNEL 1 SETUP window in vibration mode

5.2.1 Selection of measurement mode for sound or vibration - MODE

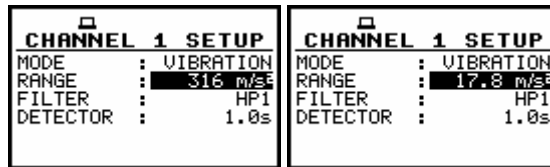
In the **MODE** the user can select the mode of measurements for selected channel. Two modes are available: **VIBRATION** and **SOUND**. The selection is made by **<◀>**, **<▶>** push-buttons and pressing the **<ENTER>** one.



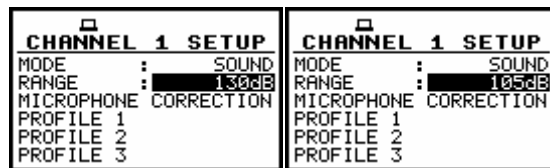
CHANNEL 1 SETUP windows with MODE selection

5.2.2 Measurement range setting - RANGE

The **RANGE** is used to set one of the available measurement ranges in the instrument. The **RANGE** selection is made by means of the <<>, <>> push-buttons. The confirmation is made by pressing the <ENTER> one.



CHANNEL 1 SETUP windows in VIBRATION MODE with RANGE selection

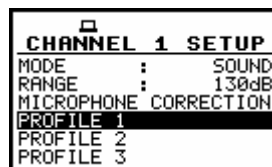


CHANNEL 1 SETUP windows in SOUND MODE with RANGE selection

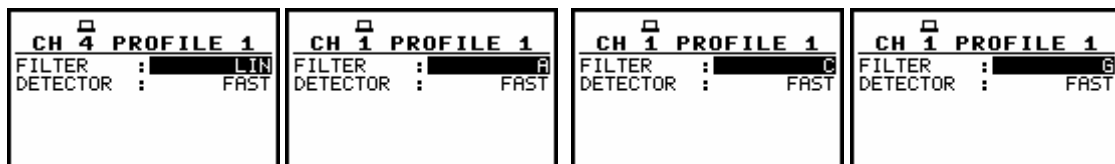
5.2.3 Weighting filter selection in a profile - FILTER

The weighting filters are different for the available measurement modes of the instrument. In the case of sound measurements the filter is selected in the **CH x PROFILE y** window (*path: MENU / INPUT / CHANNELS SETUP / CHANNEL x SETUP / PROFILE y / FILTER*) where the following filters are selectable:

- **LIN** type 1 according to the IEC 61672-1 standard,
- **A** type 1 according to the IEC 651 and IEC 61672-1 standards,
- **C** type 1 according to the IEC 651 and IEC 61672-1 standards,
- **G** type 1 according to the ISO 7196 standard.

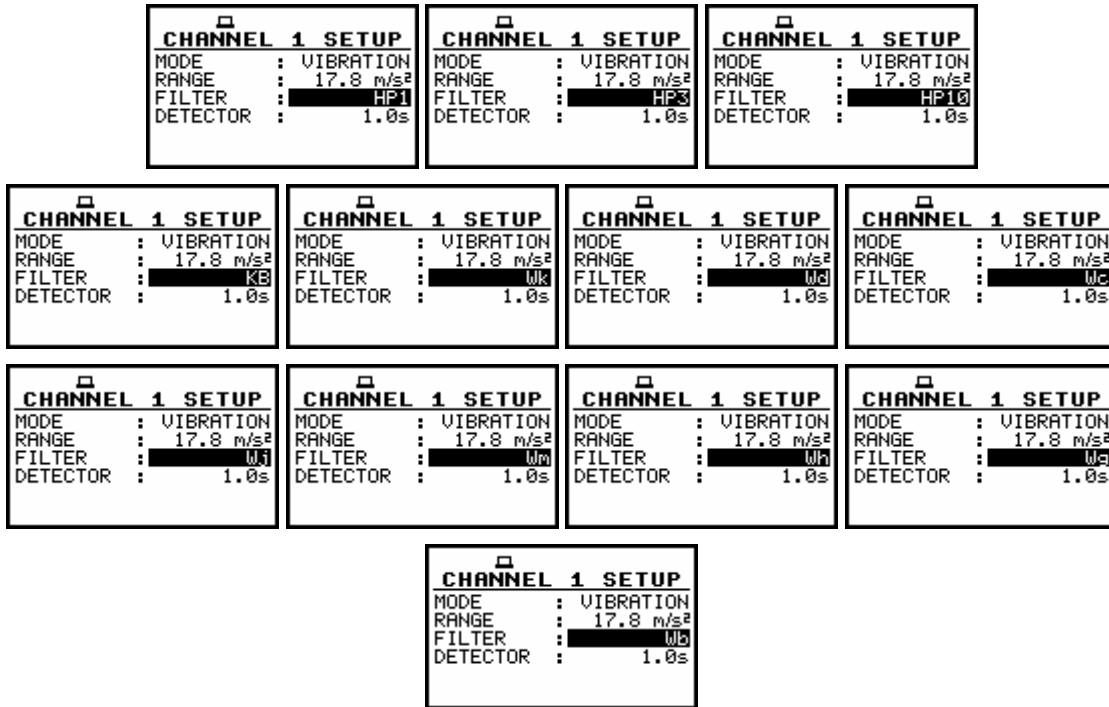


CHANNEL 1 SETUP with PROFILE 1 text highlighted



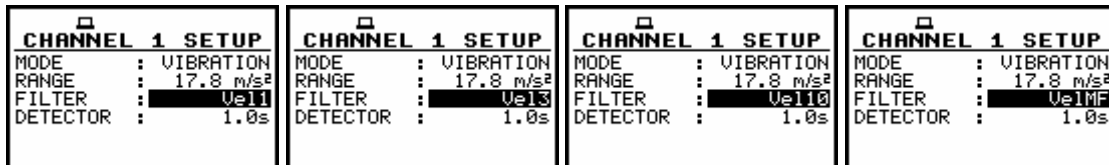
CH x PROFILE y windows with the selection of the weighting filter in SM

In the case of the acceleration measurements (vibration) the following filters are available in the **FILTER** position (*path: MENU / INPUT / CHANNELS SETUP / CHANNEL x SETUP / FILTER*): **HP1, HP3, HP10, KB, Wk, Wd, Wc, Wj, Wm, Wh, Wg** and **Wb**.



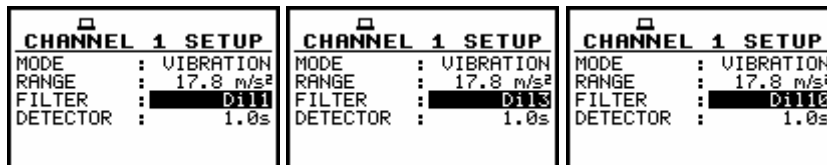
CHANNEL 1 SETUP windows with the selection of the weighting filter in acceleration measurements

In the case of the velocity measurements (vibration) the following filters are available in the **FILTER** position (*path: MENU / INPUT / CHANNELS SETUP / CHANNEL x SETUP / FILTER*): **Vel1**, **Vel3**, **Vel10** and **VelMF**.



CHANNEL 1 SETUP windows with the selection of the weighting filter in velocity measurements

In the case of the displacement measurements (vibration) the following filters are available in the **FILTER** position (*path: MENU / INPUT / CHANNELS SETUP / CHANNEL x SETUP / FILTER*): **Di11**, **Di13** and **Di110**.



CHANNEL 1 SETUP windows with the selection of the weighting filter in displacement measurements

The characteristics of the filters are given in App. D. The selection of the required filter is made with 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 previous list ignoring any changes made in the sub-list is made after pressing the <ESC> push-button.

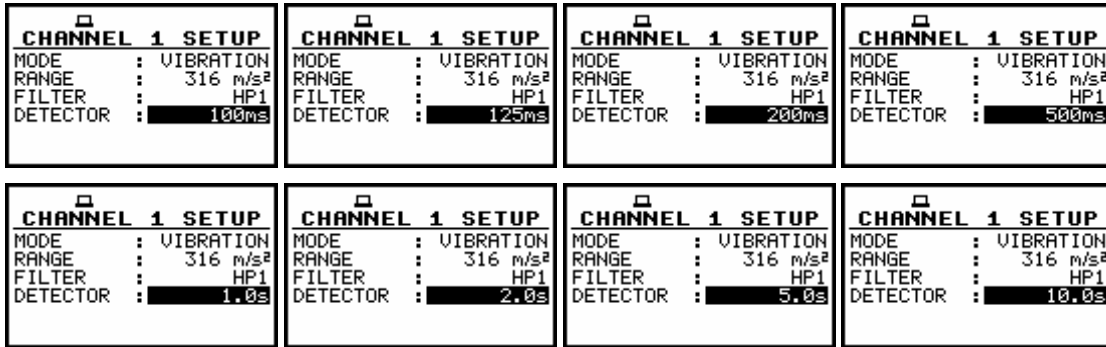
5.2.4 RMS detector selection - DETECTOR

In the instrument, the following RMS detectors are available: **IMPULSE**, **FAST** and **SLOW** (in the case of sound measurements) and **100ms**, **125ms**, **200ms**, **500ms**, **1.0s**, **2.0s**, **5.0s**, **10.0s** (in the case of vibration measurements).

The selection of the required detector is made with the <<>, <>> push-buttons. In the case of sound mode the user can enter the **DETECTOR** line in the **PROFILE y** sub-list pressing the <^>, <v> 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 previous list ignoring any changes made in the sub-list is made after pressing the <ESC> push-button.



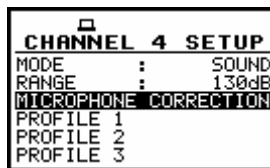
CHANNEL x PROFILE y windows (SM) with the selection of the RMS detector



CHANNEL x PROFILE y windows (VM) with the selection of the RMS detector

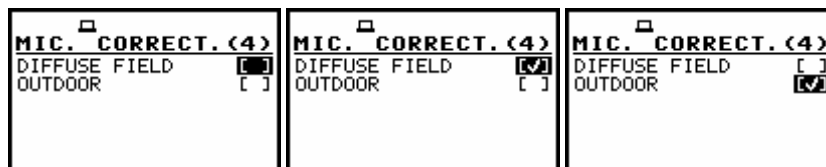
5.2.5 Setting the parameters of microphone (SM) - MICROPHONE CORRECTION

It enables the user to switch on/off **DIFFUSE FIELD** correction or **OUTDOOR** filter correction. In order to enter the window the user has to select the **MICROPHONE CORRECTION** text in the **SETUP** list, using the <^>, <v> (or <<>, <>>) push-buttons and press the <ENTER> one. The characteristics of those filters are given in Appendix D.



CHANNEL 4 SETUP, MICROPHONE CORRECTION text selected

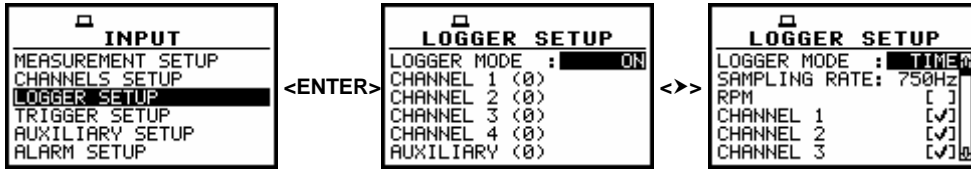
The selection of required compensation filter is made with <<>, <>> and the confirmation is made by pressing <ENTER>.



MICROPHONE CORRECTION window, DIFFUSE FIELD selection and OUTDOOR selection

5.3 Results selection for saving in a logger's file - **LOGGER SETUP**

In the **LOGGER SETUP**, it is possible to select logger results to be saved in the logger memory (when in the logger mode position is selected **ON**) and to set parameters of time domain signal recording (**TIME** mode). In order to enter the **LOGGER SETUP** window the user has to select the **LOGGER SETUP** text in the **INPUT** list and press **<ENTER>**.



LOGGER SETUP option selected and available **LOGGER MODES**

5.3.1 Selecting results to be saved in instrument's logger memory - **LOGGER MODE**

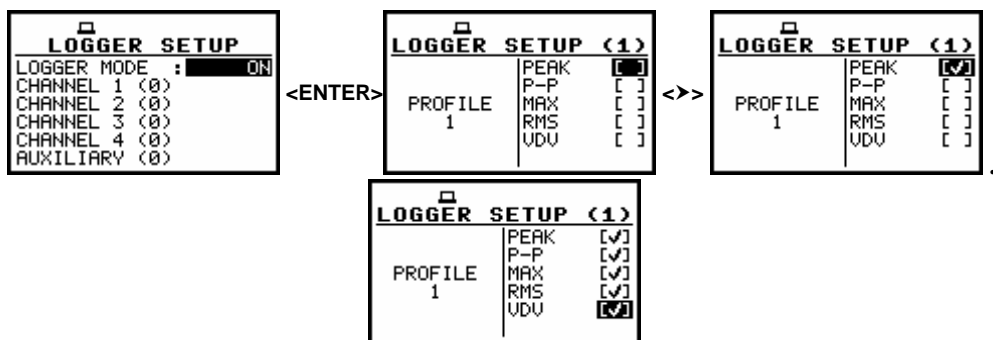
In **LOGGER MODE** position, it is possible to select **OFF**, **ON**, **TIME** modes. In the **OFF** mode the logger functionality is switched off. When **ON** is selected, it is possible to choose logger results to be saved in memory of the instrument. Selecting **TIME** mode activates low sampling rate time-domain signal recording. Activation of this option requires introduction of a special code.

5.3.2 Selecting time history results to be saved in the memory - **LOGGER MODE: ON**

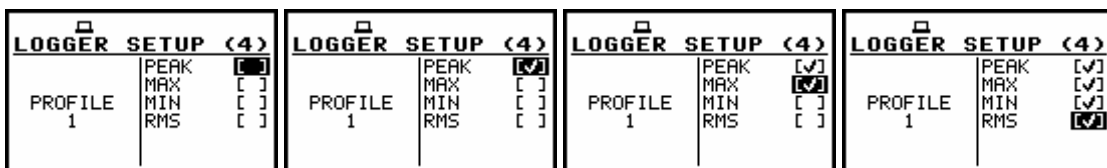
Up to five measurement results from each profile can be saved in the logger's file of the instrument **PEAK**, **P-P**, **MAX**, **RMS**, **VDV** in the case of vibration measurements and four results: **PEAK**, **MAX**, **MIN** and **RMS** in the case of sound measurements.

In order to save the required results (cf. the definition in App. D) the user has to choose the proper channel and place special characters in the lines with the names of results 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.



LOGGER SETUP windows (VM) with the selection of the results to be saved or saved in a logger's file

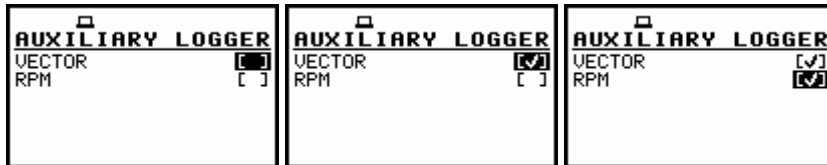


LOGGER SETUP windows (SM) with the selection of the results to be saved in a logger's file

It is also possible to save **VECTOR** calculation and **RPM** measurement results in a logger file. In order to save the required results the user has to enter the **AUXILIARY** window and place special characters in the lines with the names of results 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 performed after pressing the <ESC> push-button.



AUXILIARY LOGGER window with the selection of **VECTOR** and **RPM** result to be saved in a logger's file

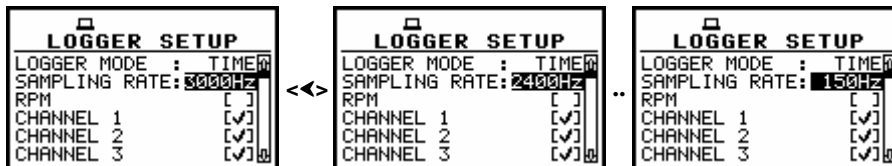
5.3.3 Selecting parameters of low sampling rate time domain signal recording (svn format) in memory of the instrument - **LOGGER MODE: TIME**

The time domain signal can be stored in the logger memory of the instrument with a sampling rate from **150 Hz** to **3000 Hz**.

The selection of the **SAMPLING RATE** is made with the <<>, <>> push-buttons. Available options in this position are as follows: **3000 Hz**, **2400 Hz**, **1500 Hz**, **1200 Hz**, **750 Hz**, **600 Hz**, **375 Hz**, **300 Hz**, **187 Hz**, **150 Hz**.

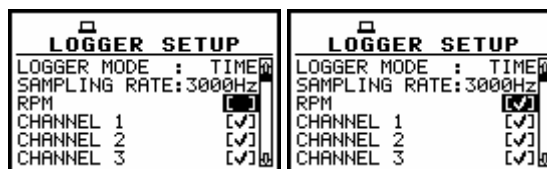
The confirmation of the selection requires pressing the <ENTER> push-button.

It is also possible to save **RPM** result and to select the channels from which the time domain signal is to be recorded.



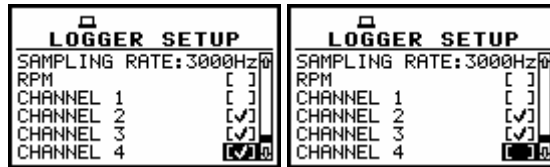
LOGGER SETUP window, **SAMPLING RATE** selection

To save **RPM** measurement results the user has to place a special character in the line with **RPM** text and also has to enable the **RPM** function in **AUXILIARY SETUP** window (*path: MENU / INPUT / AUXILIARY SETUP / RPM SETUP / ENABLED: [✓]*) and change **EXT.I/O** settings into **DIGITAL IN** (*path: MENU / SETUP / EXT. I/O SETUP / MODE: DIGITAL IN*).



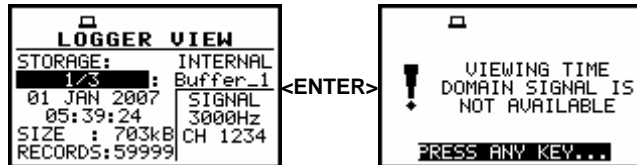
LOGGER SETUP window, **RPM** selection

The selection of the channels for recording time domain signal from them is made with <<>, <>> push-buttons. The confirmation of the selection made in the window requires pressing the <ENTER> push-button.



LOGGER SETUP window, CHANNEL 4 deactivation

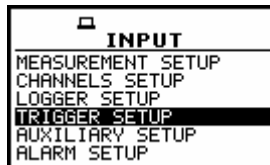
The results from selected channels are recorded in the logger memory and the files are visible in the **LOGGER VIEW** (*path: MENU / FILE / LOGGER VIEW*) window. The results of the **TIME DOMAIN** signal are not available in the instrument - they are available in svn format and can be examined after downloading them to a PC using SvanPC software.



LOGGER VIEW window with the file with time domain signal recorded and message on the display after attempt to open the file

5.4 Triggering mode and parameters selection - TRIGGER SETUP

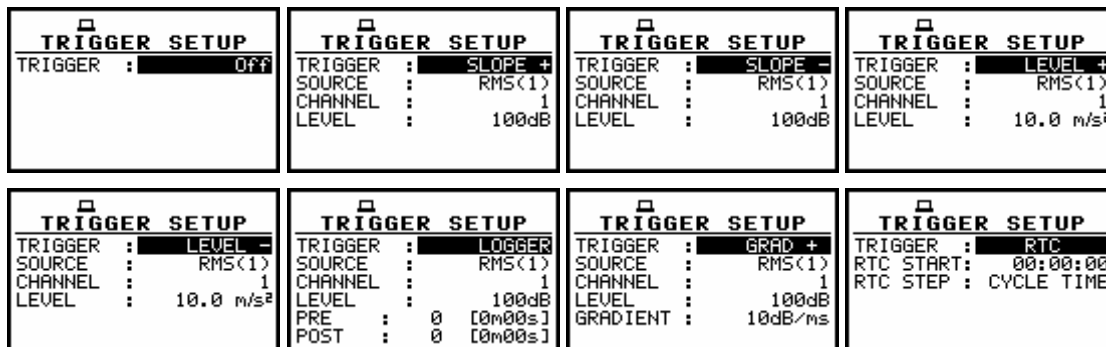
The **TRIGGER SETUP** sub-list enables the user to set the triggering parameters. This sub-list is opened after the selection of the **TRIGGER SETUP** text from the **INPUT** list by means of the <<<, >>> push-buttons and pressing the <ENTER> one.



INPUT window with TRIGGER SETUP text selected

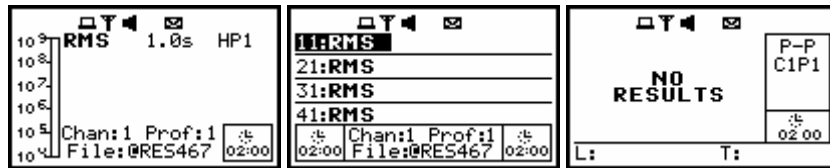
5.4.1 Switching the triggering on and off - TRIGGER

The triggering of the measurements (**TRIGGER**) can be switched off/on using the <<<, >>> push-buttons. The triggering is switched on if one of its seven modes is selected: **SLOPE +**, **SLOPE -**, **LEVEL +**, **LEVEL -**, **LOGGER**, **GRAD +** or **RTC**. The selection of the triggering mode is made using the <<<, >>> push-buttons. The confirmation is made by pressing <ENTER>.



TRIGGER SETUP window with TRIGGER mode selection

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.

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.

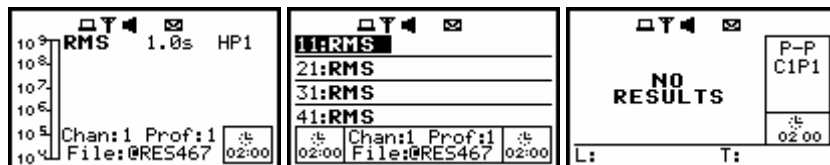
In the case when the **LEVEL -** is selected, in each second of the measurement the triggering condition is checked; the measurement is registered only when the signal has the lower level than this determined in the **LEVEL** and in the other case the measurement result is skipped.

In the case when the **LOGGER** is selected, in each logger step 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. The user can set also **PRE** and **POST** parameters. 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. In the **POST** line, the user can set the number of the results registered in the logger's file after the fulfilment of the triggering condition.

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.

In the case when **RTC (Real Time Clock)** is selected, the trigger condition is the time set in **RTC START**. The measurement is repeated with the step selected in **RTC STEP**. The number of repetition is equal to **CYCLE NUMBER** (*path: MENU / INPUT / MEASUREMENT SETUP / CYCLE NUMBER*). The user has to press **<START>** push-button and the measurement will be triggered on time selected in **RTC START**.

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

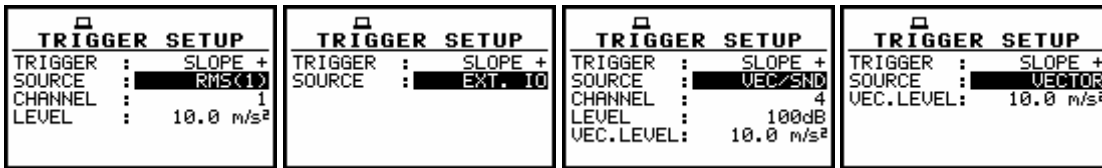
5.4.2 Selection of the triggering signal - SOURCE

In the **SOURCE** position four options are available: **RMS(1)**, **EXT. IO** (in the case of **SLOPE +** and **SLOPE -**), **VEC/SND, VECTOR**.

In the case of **GRAD +** mode only the output signal from the RMS detector coming from the first profile of the selected channel can be used as a source of triggering signal (**RMS(1)**).

In the case of **SLOPE +** and **SLOPE -** as a source of the triggering signal can be used the signal connected to the extended input/output socket named **EXT. IO**.

The selection of the source of the triggering signal is performed using the <<>, <>> push-buttons. The confirmation is made with <ENTER>.



TRIGGER SETUP windows with SOURCE selection

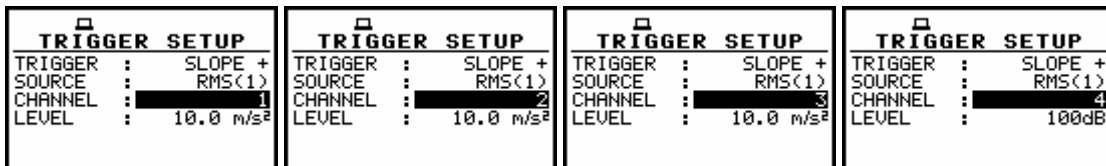


Notice: Only one signal measured in the instrument - the RMS detector in the first profile of selected channel - can be used as the triggering signal.

Additionally, the signal from **Ext. I/O** can be also used as the trigger source in the **SLOPE +** and **SLOPE -** modes.

5.4.3 Selection of channel for triggering condition - CHANNEL

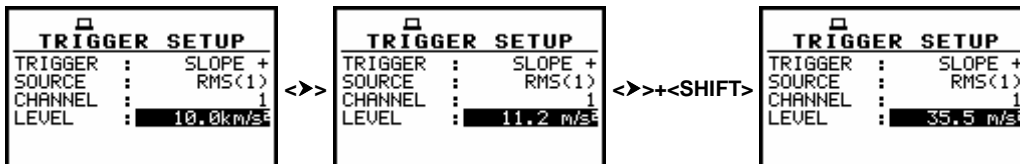
In the **CHANNEL**, the user can select the **CHANNEL** for triggering condition. The selection is made using <<>, <>> push-buttons. To confirm the selection the user has to press <ENTER>.



TRIGGER SETUP windows with CHANNEL selection

5.4.4 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 24 dB to 136 dB range or from 1 mm/s² to 10.0 km/s² using the <<>, <>> push-buttons (or <<>, <>> with <SHIFT>).



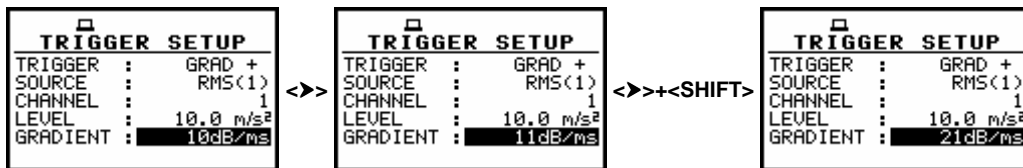
TRIGGER SETUP windows with LEVEL selection in VM



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

5.4.5 Setting the speed of the triggering signal changes - GRADIENT

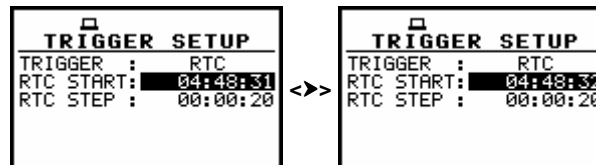
The speed of the triggering signal changes (**GRADIENT**) can be set in 1 dB/millisecond step (or 10 dB/millisecond steps) from 1 dB/ms to 100 dB/ms range using the <<>, >>> push-buttons (or <<>, >>> with <SHIFT>).



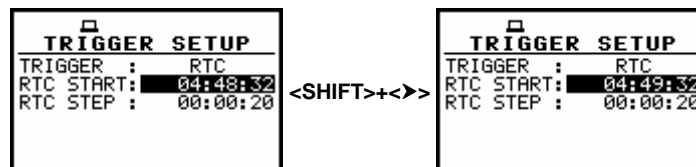
TRIGGER SETUP windows with GRADIENT selection (1 dB/ms and 10 dB/ms step up)

5.4.6 Setting the start of time-triggered measurement - RTC START

The measurement can be triggered with the time selected in **RTC START**. The selection of the required time is made with <<>, >>> push-buttons (with 1-second step) or by pressing <<>, >>> push-buttons together with <SHIFT> (with 1-minute step). The confirmation of the selection requires pressing the <ENTER> push-button, which simultaneously closes the sub-list. In order to activate waiting for trigger time the user has to press the <START> push-button.



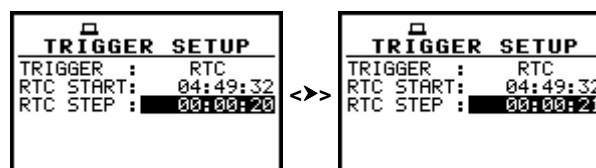
TRIGGER SETUP windows with RTC START selection with 1-second step



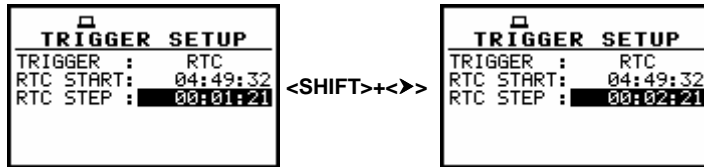
TRIGGER SETUP windows with RTC START selection with 1-minute step

5.4.7 Setting the step for repetition of time-triggered measurement - RTC STEP

Time-triggered measurement can be repeated with the step selected in the **RTC STEP**. The number of repetition is the number of cycles set in the **CYCLES NUMBER** (*path: MENU / INPUT / MEASUREMENT SETUP*). The selection of the required time is made with <<>, >>> push-buttons (with 1-second step) or by pressing <<>, >>> push-buttons together with <SHIFT> (with 1-minute step). The confirmation of the selection requires pressing the <ENTER> push-button, which simultaneously closes the sub-list. The “Antenna” icon on the top of the display indicates that the instrument waits for the next measurement.



TRIGGER SETUP windows, RTC STEP selection with 1-second step



TRIGGER SETUP windows, RTC STEP selection with 1-minute step

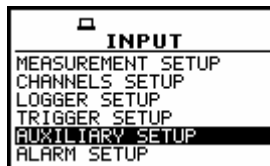
5.5 Setting parameters of auxiliary functions - AUXILIARY SETUP

The **AUXILIARY SETUP** is opened after the selection of the **AUXILIARY SETUP** text from the **INPUT** list by means of the <v>, <>> (or <v>, <>> with <SHIFT>) push-buttons and pressing the <ENTER> one.

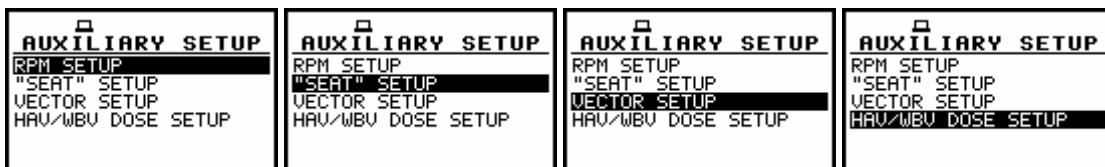
The **AUXILIARY SETUP** consists of four positions, namely: the **RPM SETUP**, **"SEAT" SETUP**, **VECTOR SETUP** and **HAV/WBV DOSE SETUP**. The selection of the line with the option to be set is made with <^>, <v> push-buttons.

The selection of the required parameter value is made with <^>, <v> and <<>, <>> 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 **AUXILIARY SETUP** is closed ignoring any changes made in there, after pressing any time the <ESC> push-button.



INPUT list with AUXILIARY SETUP text highlighted (displayed inversely)



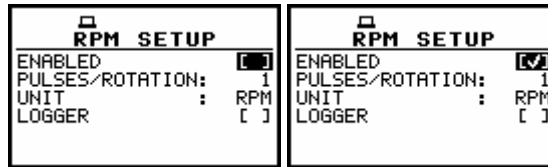
AUXILIARY SETUP windows with all available positions

5.5.1 Setting the parameters of RPM function - RPM SETUP

5.5.1.1 Enabling the RPM measurement - ENABLED

Placing a special character [√] in the line with **ENABLED** text allows one to switch on 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 **RPM** window is closed ignoring any changes made in there, after pressing any time the <ESC> push-button.

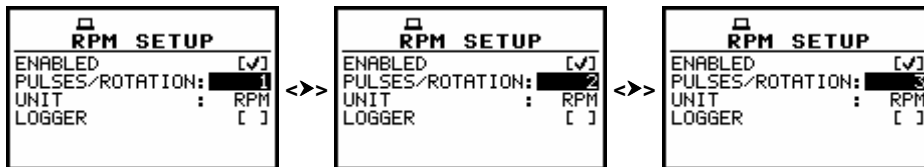


RPM SETUP window with enabling RPM function

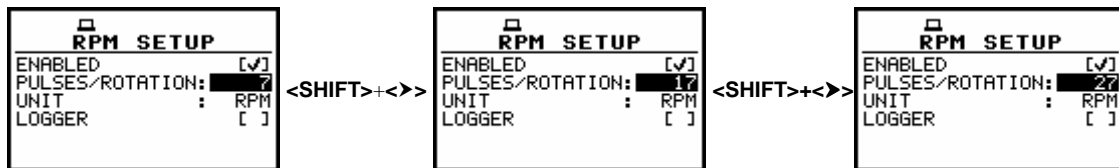
5.5.1.2 Selecting the number of pulses / rotations - PULSES / ROTATION

The **PULSES / ROTATION** enables the user to select the number of pulses / rotations during **RPM** measurement. 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 SETUP window with PULSES/ROTATION selection with 1-unit step



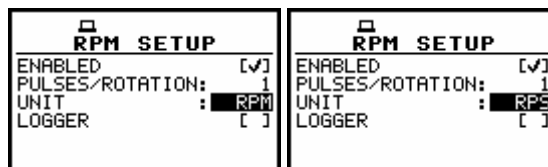
RPM SETUP window with PULSES/ROTATION selection with 10-units step

5.5.1.3 Selecting the unit of RPM measurement - UNIT

The **UNIT** enables the user to select the unit of the measurement. In this position two options 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 SETUP** window is closed ignoring any changes made in there, after pressing any time the <ESC> push-button.

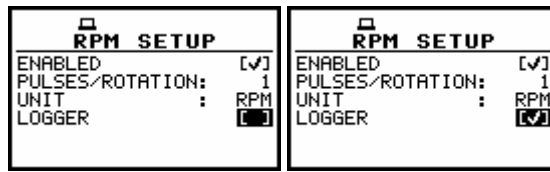


RPM SETUP window; the UNIT selection

5.5.1.4 Activation of logger for RPM measurements - LOGGER

The **RPM** measurement results can be saved in the logger's file of the instrument. 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 **RPM SETUP** window is closed ignoring any changes made in there, after pressing any time the **<ESC>** push-button.



RPM SETUP windows with **LOGGER** activation

5.5.2 Setting the parameters of attenuation measurements - “SEAT” SETUP

The “**SEAT**” **SETUP** option may be used for attenuation measurements of vibration. One of the channels (**BASE CHANNEL**) measures the signal before attenuation and other (**SEAT CHANNEL**) measures the signal after attenuation (e.g. as in the case of the seat suspension in vehicles).

The “**SEAT**” **SETUP** is opened after the selection of the “**SEAT**” **SETUP** text from the **AUXILIARY SETUP** list by means of the **<▲>**, **<▼>** push-buttons and pressing the **<ENTER>** one.

The “**SEAT**” **SETUP** consists of three positions, namely: **ENABLED**, **SEAT CHANNEL**, **BASE CHANNEL**. The selection of the line with the option to be set is made with **<▲>**, **<▼>** push-buttons. The selection of the required parameter value is made with **<<>**, **<>>** 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 “**SEAT**” **SETUP** is closed ignoring any changes made in there, after pressing any time the **<ESC>** push-button.

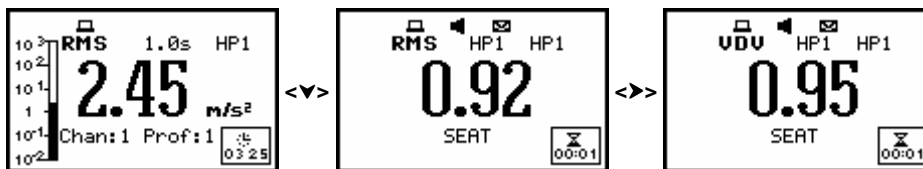


AUXILIARY SETUP window with “**SEAT**” **SETUP** text highlighted

The **SEAT** result is presented in one profile presentation mode. It is calculated by dividing **RMS** result from **SEAT CHANNEL** by **RMS** result from **BASE CHANNEL**.

Additionally, if **VDV** result is available for filters selected in **CHANNELS SETUP** window, the **SEAT** result is calculated by dividing **VDV** result from **SEAT CHANNEL** by **VDV** result from **BASE CHANNEL**.

The **SEAT** result is available after pressing **<▼>** and **<>>** push-buttons in one profile view.

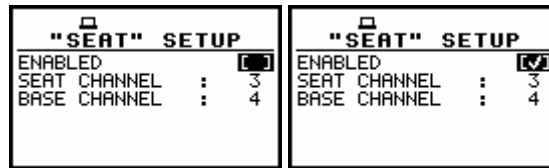


Selection of **SEAT** results presentation

5.5.2.1 Enabling the attenuation measurements - **ENABLED**

Placing a special character **[√]** in the line with **ENABLED** text means that the “**SEAT**” **SETUP** settings are activated. The change is made by means of the **<<>**, **<>>** push-buttons.

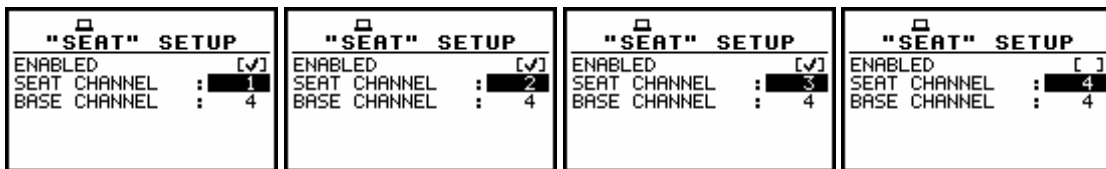
The confirmation of the activation/deactivation requires pressing the **<ENTER>** push-button, which simultaneously closes the window. The **"SEAT" SETUP** window is closed ignoring any changes made in there, after pressing any time the **<ESC>** push-button.



"SEAT" SETUP windows with the enabling of the function

5.5.2.2 Selection of the seat channel for attenuation measurements - SEAT CHANNEL

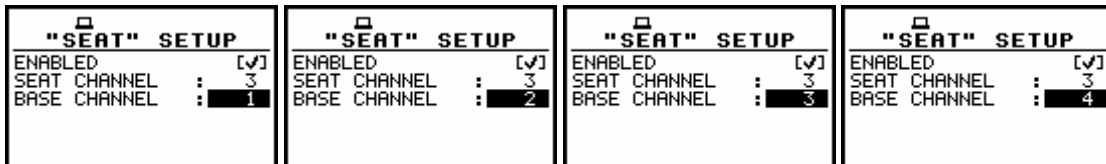
In the **SEAT CHANNEL**, the user can select the "seat" channel for attenuation measurements. The selection is made with **<←>**, **<→>** push-buttons. The confirmation of the selection requires pressing the **<ENTER>** push-button, which simultaneously closes the window. The **"SEAT" SETUP** window is closed ignoring any changes made in there, after pressing any time the **<ESC>** push-button.



"SEAT" SETUP windows with SEAT CHANNEL selection

5.5.2.3 Selection of the base channel for attenuation measurements - BASE CHANNEL

In the **BASE CHANNEL**, the user can select the base channel for attenuation measurements. The selection is made with **<←>**, **<→>** push-buttons. The confirmation of the selection requires pressing the **<ENTER>** push-button, which simultaneously closes the window. The **"SEAT" SETUP** window is closed ignoring any changes made in there, after pressing any time the **<ESC>** push-button.

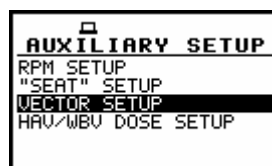


"SEAT" SETUP windows with BASE CHANNEL selection

5.5.3 Settings for vector calculations - VECTOR SETUP

In **VECTOR SETUP** window, the user may select the coefficients to calculate the vector. When the user needs to calculate it with other than standard coefficients, it is possible to select the coefficient within the values from **0.00** to **2.00**.

In order to enter **VECTOR SETUP** window the user has to select **VECTOR SETUP** text in **AUXILIARY SETUP** window and press **<ENTER>**.



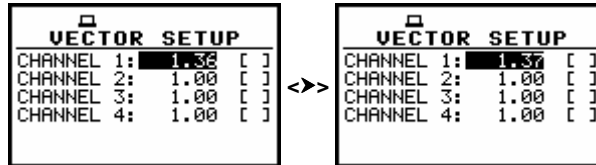
AUXILIARY SETUP window with VECTOR SETUP text highlighted

The values presented below are taken into account during the calculations of the measurement results. **VECTOR** is calculated according to the formulae:

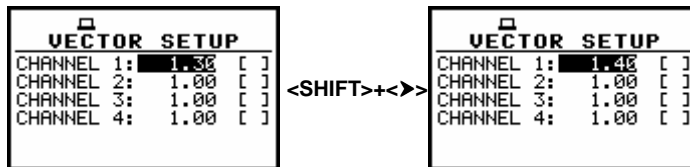
$$\mathbf{VECTOR} = \sqrt{k_1x_1^2 + k_2x_2^2 + k_3x_3^2 + k_4x_4^2}$$

Where k_1, k_2, k_3 and k_4 are the coefficients and x_1, x_2, x_3 and x_4 are RMS results for different channels. It is important that the user should choose only coefficients corresponding with the proper channels.

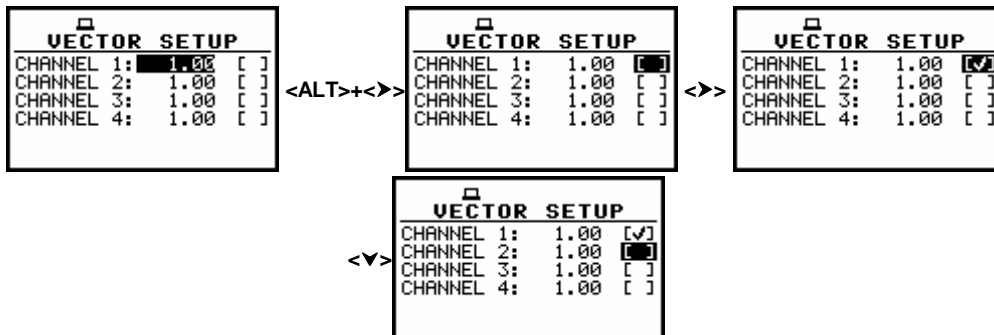
The coefficient selection is made with the <<>, <>> push-buttons. The confirmation of the selection requires pressing the <ENTER> push-button, which simultaneously closes the window. The **VECTOR SETUP** window is closed ignoring any changes made in there, after pressing any time the <ESC> push-button.



VECTOR SETUP windows with the coefficient selection with 1-unit step



VECTOR SETUP windows with the coefficient selection with 10-units step



VECTOR SETUP windows with the selection of results from channels for vector calculation

If **HAV/WBV DOSE** option is also enabled and the filters set in **CHANNELS SETUP** are incorrect for dose calculation the message “**VIBRATION DOSEMETER OFF - INCORRECT DOSEMETER SETTINGS**” appears on the display after pressing <START> push-button. It has no influence on vector calculation – after pressing a push-button the measurement will be started.



Display in the starting measurements when user selects incorrect filters for HAV/WBV calculations

5.5.4 Setting the parameters for dose measurements - HAV/WBV DOSE SETUP

The **HAV/WBV DOSE SETUP** is opened after the selection of the **HAV/WBV DOSE SETUP** text from the **AUXILIARY SETUP** list by means of the <▲>, <◀> (or <▲>, <◀> with <SHIFT>) push-buttons and pressing the <ENTER> one.

The **HAV/WBV DOSE SETUP** consists of three positions, namely: **ENABLED**, **EXPOSURE TIME**, **X (Y, Z) AXIS**. The selection of the line with the option to be set is made with <▲>, <▼> push-buttons. The selection of the required parameter value is made with <◀>, <▶> 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 **HAV/WBV DOSE SETUP** is closed ignoring any changes made in there, after pressing any time the <ESC> push-button.



AUXILIARY SETUP window with HAV/WBV DOSE SETUP text selected

For the **HAV/WBV DOSE** measurements the user should switch on **HAV/WBV DOSE** option (*path: MENU / INPUT / AUXILIARY SETUP / HAV/WBV DOSE / ENABLED: [√]*), select three from four possibilities and select suitable filters in **CHANNELS SETUP**. If the user selects all k-vectors, the result will be incorrect.

If the wrong filters are selected, the “**VIBRATION DOSEMETER OFF- INCORRECT DOSEMETER SETTINGS**” message appears on the display and the **VIBRATION DOSEMETER** is switched off automatically.

Correct filters in the case of Hand-Arm vibration dose measurements are as follows:

- **Wh** for **X** axis
- **Wh** for **Y** axis
- **Wh** for **Z** axis

Commonly used filters for Whole-Body vibration dose are as follows:

- **Wd** for **X** axis
- **Wd** for **Y** axis
- **Wk** for **Z** axis



Display after starting measurements when user selected incorrect filters for HAV/WBV DOSE calculations

5.5.4.1 Enabling HAV/WBV settings - ENABLED

The placing a special character [√] in the line with **ENABLED** text means that the **HAV/WBV DOSE** settings are activated. The change is made by means of the <◀>, <▶> push-buttons.

The confirmation of the activation/deactivation requires pressing the <ENTER> push-button, which simultaneously closes the window. The **HAV/WBV DOSE SETUP** window is closed ignoring any changes made in there, after pressing any time the <ESC> push-button.

| HAU/WBV DOSE | | HAU/WBV DOSE | |
|----------------|---------|----------------|---------|
| ENABLED | [] | ENABLED | [X] |
| EXPOSURE TIME: | 08h00 | EXPOSURE TIME: | 08h00 |
| X AXIS | : 1 HP1 | X AXIS | : 1 HP1 |
| Y AXIS | : 2 HP1 | Y AXIS | : 2 HP1 |
| Z AXIS | : 3 HP1 | Z AXIS | : 3 HP1 |
| STANDARDS | | STANDARDS | |

HAU/WBV DOSE windows with the enabling of the option

5.5.4.2 Setting the time of exposure - EXPOSURE TIME

The **EXPOSURE TIME** enables the user to set the desired value of the exposure time that is used for the calculation **HAU/WBV DOSE** results. The **EXPOSURE TIME** values are within the range [00h01, 24h00]. The required value can be set using the <<>, <>> push-buttons with one minute step. The step can be decremented / incremented up to 30 minutes after pressing the <<>, <>> push-buttons together with the <SHIFT> one.

The window is closed and the instrument returns to the **INPUT** 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).

| HAU/WBV DOSE | | HAU/WBV DOSE | | HAU/WBV DOSE | |
|----------------|---------|----------------|---------|----------------|---------|
| ENABLED | [] | ENABLED | [] | ENABLED | [] |
| EXPOSURE TIME: | 07h00 | EXPOSURE TIME: | 07h30 | EXPOSURE TIME: | 08h00 |
| X AXIS | : 1 HP1 | X AXIS | : 1 HP1 | X AXIS | : 1 HP1 |
| Y AXIS | : 2 HP1 | Y AXIS | : 2 HP1 | Y AXIS | : 2 HP1 |
| Z AXIS | : 3 HP1 | Z AXIS | : 3 HP1 | Z AXIS | : 3 HP1 |
| STANDARDS | | STANDARDS | | STANDARDS | |

HAU/WBV DOSE windows with EXPOSURE TIME selection with 30-minutes step

| HAU/WBV DOSE | | HAU/WBV DOSE | | HAU/WBV DOSE | |
|----------------|---------|----------------|---------|----------------|---------|
| ENABLED | [] | ENABLED | [] | ENABLED | [] |
| EXPOSURE TIME: | 06h58 | EXPOSURE TIME: | 06h59 | EXPOSURE TIME: | 07h00 |
| X AXIS | : 1 HP1 | X AXIS | : 1 HP1 | X AXIS | : 1 HP1 |
| Y AXIS | : 2 HP1 | Y AXIS | : 2 HP1 | Y AXIS | : 2 HP1 |
| Z AXIS | : 3 HP1 | Z AXIS | : 3 HP1 | Z AXIS | : 3 HP1 |
| STANDARDS | | STANDARDS | | STANDARDS | |

HAU/WBV DOSE windows with EXPOSURE TIME selection with 1-minute step

5.5.4.3 Selection of channels for HAV/WBV DOSE calculation - X AXIS, Y AXIS, Z AXIS

The **X AXIS**, **Y AXIS**, **Z AXIS** positions enable setting of proper channels to be taken for calculation of **HAU/WBV DOSE** results. The selection is made with the <<>, <>> push-buttons. The confirmation is made by pressing the <ENTER> one. The window is closed ignoring any changes made in there, after pressing any time the <ESC> push-button.

| HAU/WBV DOSE | | HAU/WBV DOSE | | HAU/WBV DOSE | | HAU/WBV DOSE | |
|----------------|---------|----------------|---------|----------------|---------|----------------|---------|
| ENABLED | [] | ENABLED | [] | ENABLED | [] | ENABLED | [] |
| EXPOSURE TIME: | 08h00 | EXPOSURE TIME: | 08h00 | EXPOSURE TIME: | 08h00 | EXPOSURE TIME: | 08h00 |
| X AXIS | : 1 HP1 | X AXIS | : 2 HP1 | X AXIS | : 3 HP1 | X AXIS | : 4 HP1 |
| Y AXIS | : 2 HP1 | Y AXIS | : 2 HP1 | Y AXIS | : 2 HP1 | Y AXIS | : 2 HP1 |
| Z AXIS | : 3 HP1 | Z AXIS | : 3 HP1 | Z AXIS | : 3 HP1 | Z AXIS | : 3 HP1 |
| STANDARDS | | STANDARDS | | STANDARDS | | STANDARDS | |

HAU/WBV DOSE windows with the selection of the channel for X AXIS

5.5.4.4 Standards selection for HAV/WBV dose calculation - STANDARDS

The **STANDARDS** position enables the user to set the standards for the measurements of the **HAU/WBV DOSE**. The available values of this position are **U.K.**, **ITALY**, **POLAND**, **FRENCH** and **USER**. The proper standard can be selected by means of the <<>, <>> push-buttons.

The confirmation of a selection is made by pressing the <ENTER> push-button, which simultaneously closes the window. The **STANDARDS** is closed ignoring any changes made in there, after pressing any time the <ESC> push-button. In the case of **USER** option, it is possible

to select required parameters. The selection is made with the <<>, <>> push-buttons. The confirmation is made by pressing <ENTER>.

| HAU/WBV DOSE | |
|----------------|---------|
| ENABLED | [✓] |
| EXPOSURE TIME: | 08h00 |
| X AXIS | : 1 HP1 |
| Y AXIS | : 2 HP1 |
| Z AXIS | : 3 HP1 |
| STANDARDS | |

HAU/WBV DOSE windows with STANDARDS text highlighted

| STANDARDS | | STANDARDS | | STANDARDS | | STANDARDS | |
|------------|-----------------------|------------|-----------------------|------------|------------------------|------------|-----------------------|
| STANDARD : | U.K. | STANDARD : | ITALY | STANDARD : | POLAND | STANDARD : | FRENCH |
| HA EAV : | 2.50 m/s ² | HA EAV : | 2.50 m/s ² | MNDN8h : | 2.80 m/s ² | HA EAV : | 2.50 m/s ² |
| HA ELV : | 5.00 m/s ² | HA ELV : | 5.00 m/s ² | MNDN30 : | 11.20 m/s ² | HA ELV : | 5.00 m/s ² |
| WB EAV : | 9.10 m/s ² | WB EAV : | 0.50 m/s ² | ONDN8h : | 0.80 m/s ² | WB EAV : | 0.50 m/s ² |
| WB ELV : | 1.15 m/s ² | WB ELV : | 1.15 m/s ² | ONDN30 : | 3.20 m/s ² | WB ELV : | 1.15 m/s ² |

| STANDARDS | |
|------------|-----------------------|
| STANDARD : | USER |
| HA EAV : | 2.50 m/s ² |
| HA ELV : | 5.00 m/s ² |
| WB EAV : | 9.10 m/s ² |
| WB ELV : | 1.15 m/s ² |

STANDARDS windows with STANDARD selection

In the case of **USER** option, it is possible to select the required parameters. The selection is made with the <<>, <>> push-buttons. The confirmation is made by pressing the <ENTER> one.

5.6 Selection of parameters for alarm triggering - ALARM SETUP

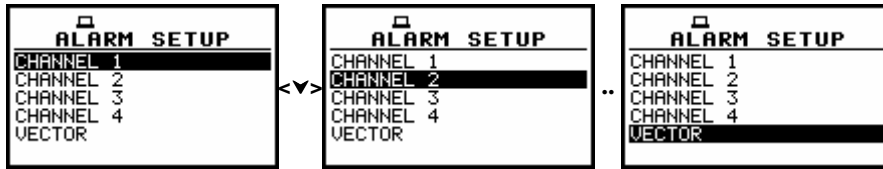
There is a possibility to set two alarms which trigger sending message to the user about overpassing (in plus or in minus) the sound or vibration signal level. In case of **1/1 OCTAVE** or **1/3 OCTAVE** analysis mode it is possible to set third alarm which also triggers sending message to the user if the signal from one of the central frequencies of **1/1 OCTAVE** or **1/3 OCTAVE** mode fulfils the triggering condition.

The alarms work independently from each other. In order to set the alarm parameters the user has to select **ALARM SETUP** text in the **INPUT** list with <<>, <>> push-buttons and press <ENTER>. Then the user has to select **CHANNEL** respectively, to made settings and, if the vector result is to be a source for triggering, to do settings also for **VECTOR**. Next the user has to select **PROFILE x** or, in the case of **1/1 OCTAVE** or **1/3 OCTAVE** analysis, select **1/1 OCTAVE SETUP** or **1/3 OCTAVE SETUP** text.

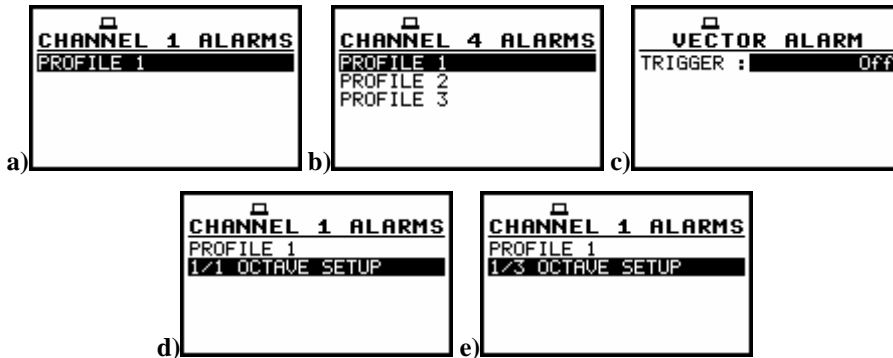
In the window the user can select such parameters as **TRIGGER** mode (**LEVEL +**, **LEVEL -**), **INTEGR.** (integration period with **LOGGER STEP**, **100 ms**, **1.0 s**, **MEASUR. TIME**), **SOURCE** (**PEAK**, **P-P**, **MAX**, **MIN**, **RMS**, **VDV**), **LEVEL** (from **1mm/s²** to **10 km/s²** in the case of vibration measurements and from **24.0 dB** to **136 dB** in the case of sound measurements).

| INPUT | |
|-------------------|--|
| MEASUREMENT SETUP | |
| CHANNELS SETUP | |
| LOGGER SETUP | |
| TRIGGER SETUP | |
| AUXILIARY SETUP | |
| ALARM SETUP | |

INPUT list, ALARM SETUP text highlighted



ALARM SETUP windows, CHANNEL 2 or VECTOR selection

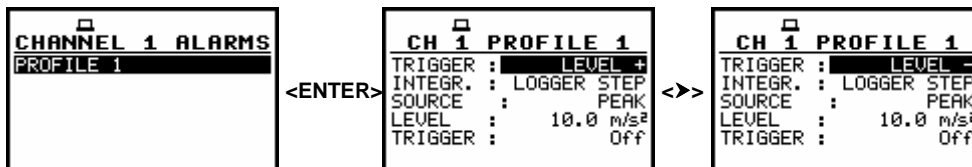


Vibration channel opened in LM (a), sound channel opened in LM (b) VECTOR ALARM window opened in LM (c) vibration channel opened in 1/1 OCTAVE (d) and 1/3 OCTAVE (e) analysis mode

The triggering is switched on if one of its two modes is selected: **LEVEL +**, **LEVEL -**. In the case when the **LEVEL +** is selected, the triggering condition is checked for the time set in **INTEGR.** position; the alarm is switched on. The user receives the message only when the signal has the greater level than this determined in the **LEVEL**.

In the case when the **LEVEL -** is selected, the triggering condition is checked for the time set in **INTEGR..** The measurement is registered only when the signal has the lower level than this determined in the **LEVEL**.

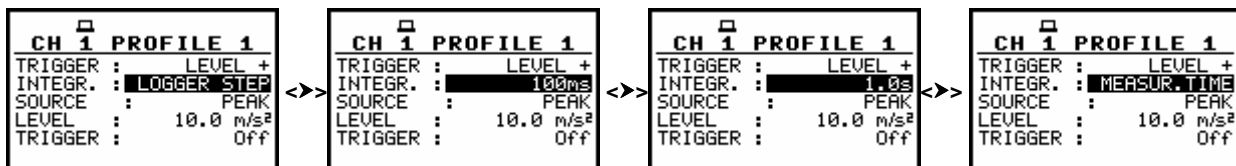
The selection of the triggering mode is performed using the <<>, <>> push-buttons.



Setting ALARM conditions, TRIGGER mode selection

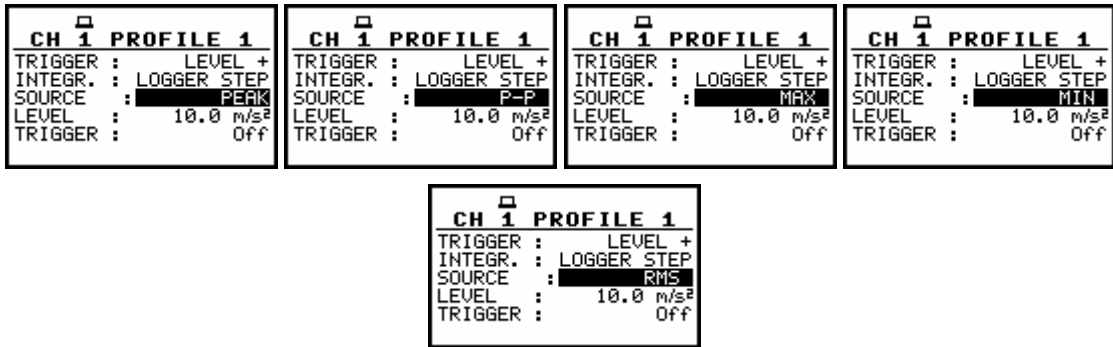
In the **INTEGR.** (integration period) position the user can select the period from which the result is checked with the trigger conditions. Available options are as follows: **LOGGER STEP**, **100 ms**, **1.0 s** and **MEASUR. TIME**.

If the **MEASUR. TIME** is set in the **INTEGR.** position the alarm condition will be checked in each second of the performed measurement.

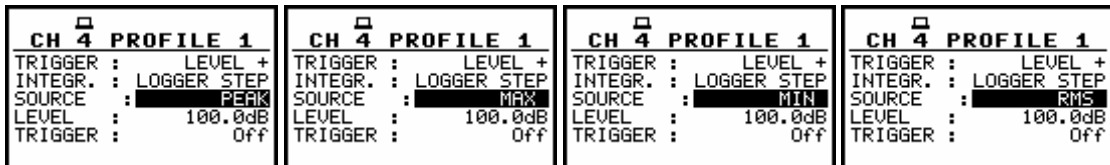


Setting ALARM conditions, INTEGRATION period selection

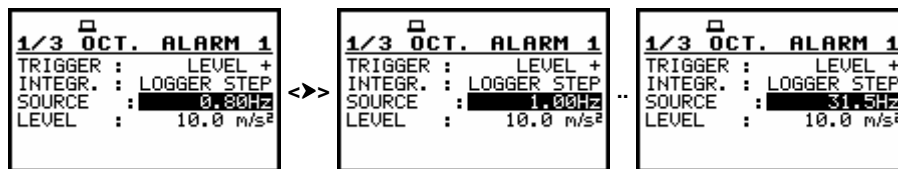
In **SOURCE**, the user sets the source from which the result is taken as an alarm condition.



Source selection in the case of vibration mode



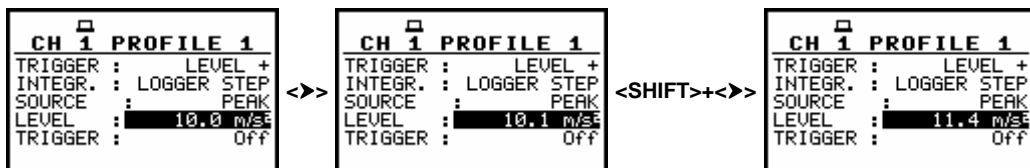
Source selection in the case of sound mode



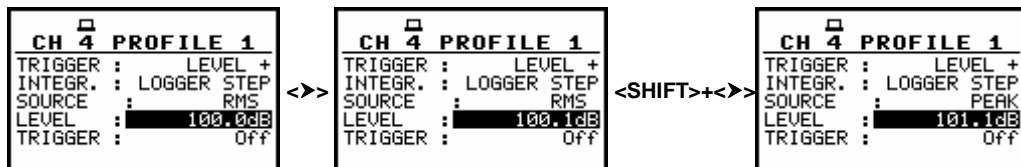
SOURCE selection for 1/3 OCTAVE option

In the **LEVEL** position, the user can select the level of the signal, which activates alarm and causes sending message to the user.

The available values are from **1mm/s²** to **10 km/s²** in the case of vibration measurements and from **24.0 dB** to **136 dB** in the case of sound measurements. The selection is made with <<>, >>>. Pressing **SHIFT** with <<>, >>> increases the step 10 times.



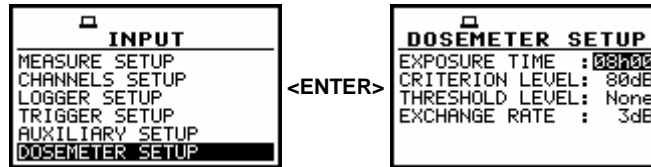
LEVEL selection with 0.1dB step and with 1dB step in the vibration channel/mode



LEVEL selection with 0.1dB step and with 1dB step in sound channel/mode

5.7 Selection of dose meter parameters - DOSEMETER SETUP

The **DOSEMETER SETUP** is accessible in the **INPUT** when the acoustic **DOSE METER** function is selected in **MEASUREMENT FUNCTION** window (path: *MENU / FUNCTION / MEASUREMENT FUNCTION / DOSE METER*). This window is opened after the selection of the **DOSEMETER SETUP** text from the **INPUT** list by means of the <^>, <v> (or <<>, <>>) push-buttons and pressing the <ENTER> one. The **DOSEMETER SETUP** consists of the parameters, which influence the calculation of the dose meter results: **EXPOSURE TIME**, **CRITERION LEVEL**, **THRESHOLD LEVEL** and **EXCHANGE RATE** (the definitions of the dose meter results are given in App. D).

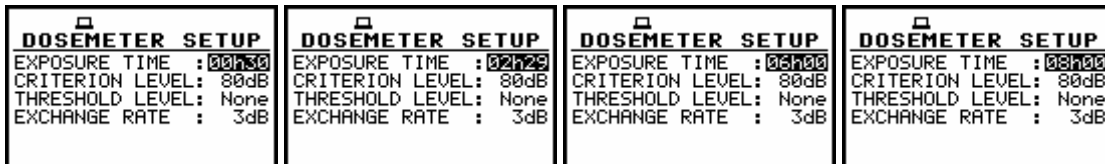


DOSEMETER SETUP selected in **INPUT** list and **DOSEMETER SETUP** window

5.7.1 Setting the exposure time - EXPOSURE TIME

The **EXPOSURE TIME** enables the user to set the desired value of the exposure time that is used for the calculation of different **DOSE METER** functions as well as **LEPd** that is also calculated in the **LEVEL METER** mode (cf. App. D for the definitions of the functions). The **EXPOSURE TIME** values are within the range [00h01, 08h00]. The required value can be set using the <<> / <>> push-buttons – after each pressing the exposure time is decremented / incremented by one second. The step can be decremented / incremented up to 30 minutes after pressing the <<> / <>> push-buttons together with the <SHIFT> one.

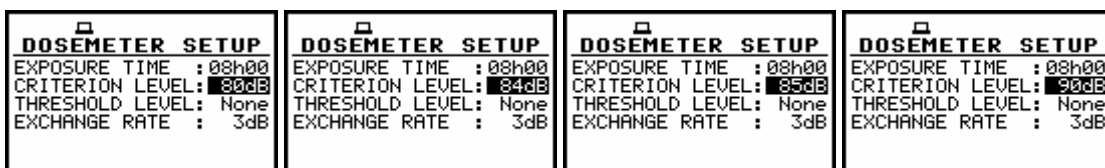
The window is closed and the instrument returns to the **INPUT** list after pressing the <ENTER> (with the confirmation of a change made in the position) or <ESC> push-buttons (ignoring a change made in the position).



DOSEMETER SETUP windows with **EXPOSURE TIME** selection

5.7.2 Setting criterion sound level - CRITERION LEVEL

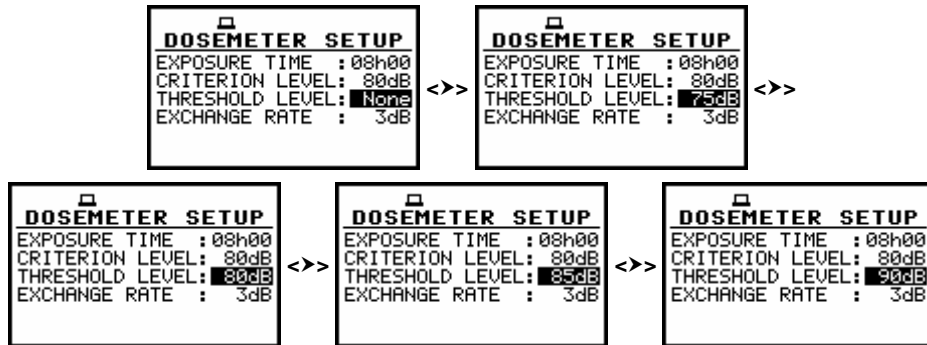
The criterion sound level influences the calculations of the **DOSE** and **D_{8h}** results. The **CRITERION LEVEL** line is accessible after pressing the <^>, <v> push-button in the **DOSEMETER SETUP** window. The available values are as follows: **80 dB**, **84 dB**, **85 dB** or **90 dB**. They can be selected by means of the <<>, <>> push-buttons. The confirmation of any change made in the line requires pressing the <ENTER> push-button, which simultaneously closes the window. The **DOSEMETER SETUP** is closed ignoring any changes made in there, after pressing any time the <ESC> push-button.



DOSEMETER SETUP windows with **CRITERION LEVEL** selection

5.7.3 Setting threshold level - THRESHOLD LEVEL

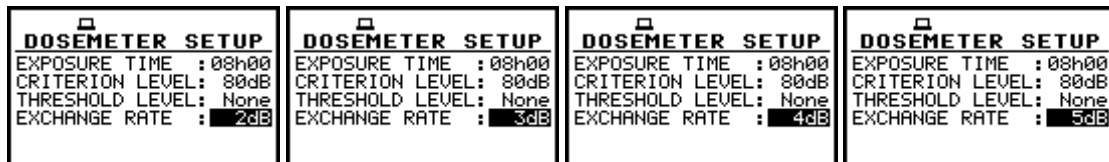
The threshold level influences the calculations of the dose meter results, namely **DOSE, D_8h** and **LAV**. The **THRESHOLD LEVEL** line is accessible after pressing the <^>, <v> push-buttons in the **DOSEMETER SETUP** window. The available values are as follows: **None, 75 dB, 80 dB, 85 dB** or **90 dB**. They can be selected by means of the <<>, <>> push-buttons. The confirmation of any change made in the line requires pressing the <ENTER> push-button, which simultaneously closes the window. The **DOSEMETER SETUP** is closed ignoring any changes made in there, after pressing any time the <ESC> push-button.



DOSEMETER SETUP windows with THRESHOLD LEVEL selection

5.7.4 Setting exchange rate - EXCHANGE RATE

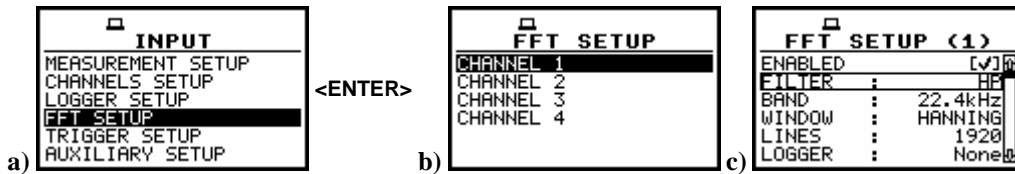
The exchange rate influences the calculations of the dose meter results, namely **DOSE, D_8h** and **LAV**. The exposure rate equal to three complies with ISO R 999 "Assessment of Occupational Noise Exposure for Hearing Conservation Purposes", while equal to five - complies with the American "Occupational Safety and Health Act" – OSHA. The **EXCHANGE RATE** line is accessible after pressing the <v> push-button in the **DOSEMETER SETUP** window. The available values are as follows: **2, 3, 4** or **5**. They can be selected by means of the <<>, <>> push-buttons. The confirmation of any change made in the line requires pressing the <ENTER> push-button, which simultaneously closes the window. The **DOSEMETER SETUP** is closed ignoring any changes made in there, after pressing any time the <ESC> push-button.



DOSEMETER SETUP windows with EXCHANGE RATE selection

5.8 Selection of FFT analysis parameters - FFT SETUP

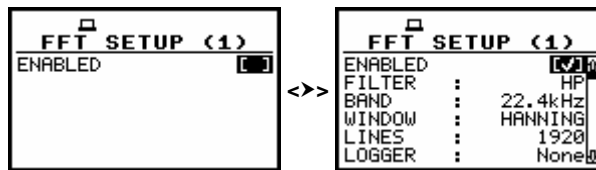
The **FFT SETUP** is accessible in the **INPUT** list when the **FFT** function is selected in the **MEASUREMENT FUNCTION** window (*path: MENU / FUNCTION / MEASUREMENT FUNCTION / FFT*). This sub-list is opened after the selection of the **FFT SETUP** text from the **INPUT** list by means of the <^>, <v> (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: **ENABLED, 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 SETUP selected in INPUT list (a), FFT SETUP window (b) and opened FFT SETUP (1) window (c)

5.8.1 Enabling the FFT analysis - ENABLED

Placing a special character [✓] in the line with **ENABLED** text means that the **FFT** analysis in selected channel can be performed. The change is made by means of the <<>, >>> push-buttons. The confirmation of the activation/deactivation requires pressing the <ENTER> push-button, which simultaneously closes the window. The **FFT SETUP** window is closed ignoring any changes made in there, after pressing any time the <ESC> push-button.

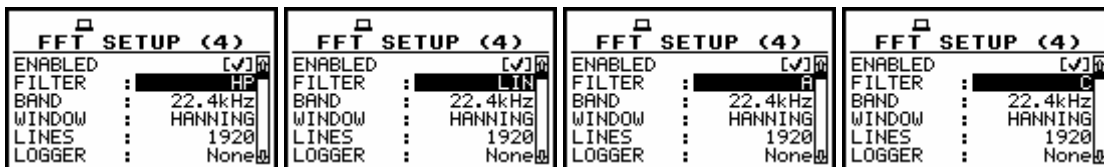


FFT SETUP window in channel 1, enabling FFT analysis

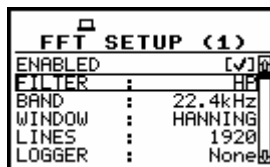
5.8.2 Selecting the weighting filter during the FFT analysis - FILTER

The **FILTER** influences the calculations of the **FFT**. In the case of sound measurements there are **HP**, **LIN**, **A** and **C** filters available. In the case of vibration measurements, only **HP** filter is available and the position is not accessible after entering the **FFT** window. The frequency characteristics of those filters mentioned above are given in Appendix D.

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.



FFT SETUP (4) window with FILTER selection in sound mode

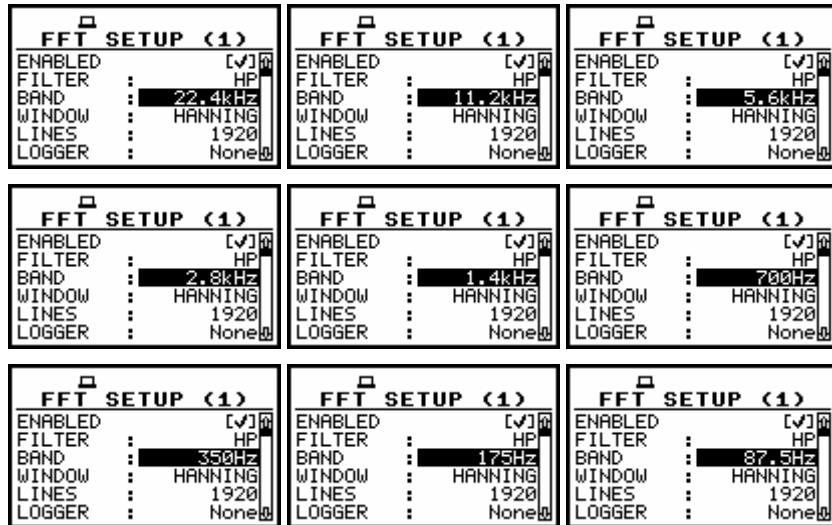


FFT SETUP (1) window with FILTER position not accessible in vibration mode

5.8.3 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

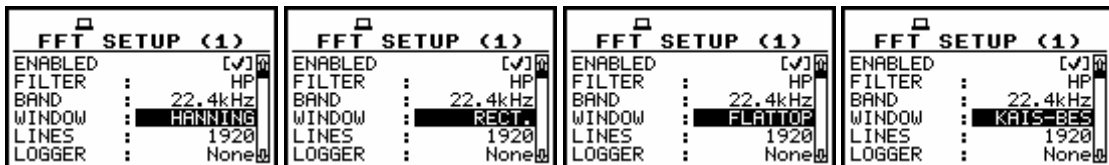
by means of the <<>, <>> push-buttons. The confirmation of the change made in the line requires pressing the <ENTER> push-button, which simultaneously closes the window. The **FFT** window is closed ignoring any changes made in there, after pressing any moment the <ESC> push-button.



FFT SETUP (1) window with BAND selection

5.8.4 Selecting the time window for the FFT analysis - WINDOW

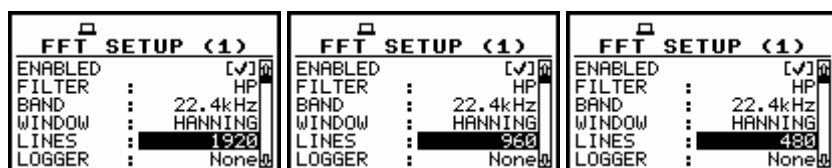
The **WINDOW** position enables the user to select the coefficients of time window, which are used in the **FFT** analysis. Available time windows of the **FFT** analysis are as follows: **HANNING**, **RECTANGLE**, **FLAT TOP**, **KAISER-BESSEL**. The selection of the window is made by means of the <<>, <>> push-buttons. The confirmation of the change made in the line requires pressing the <ENTER> push-button, which simultaneously closes the window. The **FFT SETUP (x)** window is closed ignoring any changes made in there, after pressing any time the <ESC> push-button.



FFT SETUP (1) window with WINDOW selection

5.8.5 Selecting the number of the lines in FFT analysis - LINES

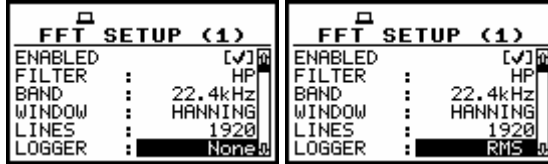
The **LINES** enables the user to select the number of lines in the **FFT** analysis. There are three values available: **1920**, **960** and **480**. The selection of the value is made by means of the <<>, <>> push-buttons. The confirmation of the change made in the position requires pressing the <ENTER>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



FFT SETUP (1) window with LINES selection

5.8.6 Enabling the FFT spectra time history logging - **LOGGER**

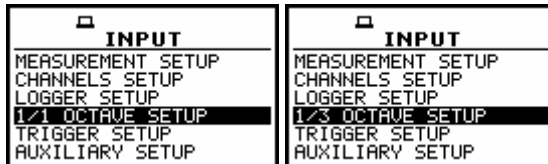
The **LOGGER** enables to record spectra of the **FFT** analysis in the logger file. In order to switch on the logger of **FFT** analysis the user has to select **RMS** text in **LOGGER** position using the **<>>** push-button and the **<ENTER>** one. If instead of the **<ENTER>** push-button the **<ESC>** one is pushed, the selection is ignored and the **FFT** sub-list is closed.



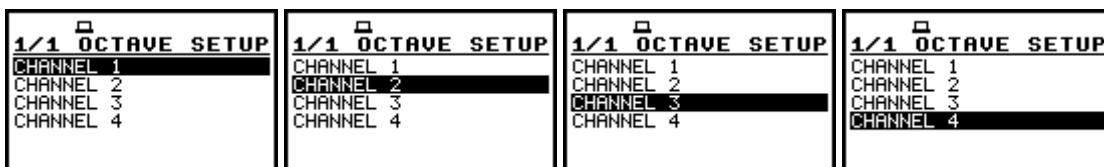
FFT SETUP (x) window with **LOGGER** activation

5.9 Selection of 1/1 and 1/3 octave spectrum parameters - 1/1 OCTAVE SETUP and 1/3 OCTAVE SETUP

The **1/1 OCTAVE SETUP** (**1/3 OCTAVE SETUP**) appears in the **INPUT** list when the **1/1 OCTAVE** (**1/3 OCTAVE**) function is selected in the **MEASUREMENT FUNCTION** list (*path: MENU / FUNCTION / MEASUREMENT FUNCTION / 1/1 OCTAVE or 1/3 OCTAVE*). This sub-list is opened after the selection of the **1/1 OCTAVE SETUP** (**1/3 OCTAVE SETUP**) text from the **INPUT** list by means of the **<^>**, **<v>** (or **<<>**, **<>>**) push-buttons and pressing the **<ENTER>** one. Then the user has to select the channel and press **<ENTER>**. The **SPECTRUM** consists of the parameters, which influence the calculation and enable logging the results of **1/1 OCTAVE** or **1/3 OCTAVE** analysis: **ENABLE**, **FILTER**, **BAND** and **LOGGER**. The **SPECTRUM** window is closed ignoring any changes made in there, after pressing any moment the **<ESC>** push-button.



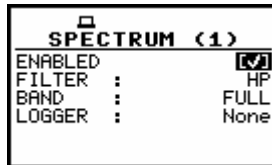
INPUT windows in the case of 1/1 OCTAVE mode and in 1/3 OCTAVE mode



1/1 OCTAVE SETUP windows with **CHANNEL** selection

5.9.1 Enabling 1/1 OCTAVE or 1/3 OCTAVE spectrum settings - **ENABLED**

Placing a special character **[√]** in the line with **ENABLED** text allows making settings in the **SPECTRUM (x)** window. 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 **SPECTRUM (x)** window is closed ignoring any changes made in there, after pressing any moment the **<ESC>** push-button.

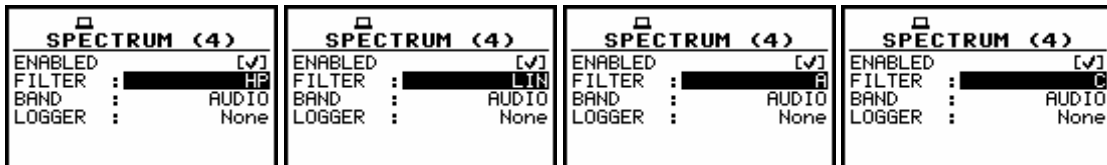


SPECTRUM window opened for channel 1

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

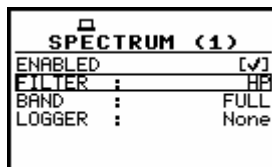
The **FILTER** influences the calculations of **1/1 OCTAVE** or **1/3 OCTAVE** analysis. In the case of sound measurements there are **HP**, **LIN**, **A** and **C** filters available. In the case of vibration measurements, only **HP** filter is available and the position is not accessible after entering the **SPECTRUM** window. The frequency characteristics of the filters mentioned above are given in Appendix D.

The selection of **FILTER** 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.



SPECTRUM (4) windows with FILTER selection in sound mode

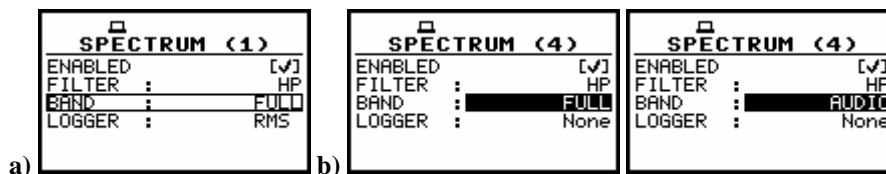
In the case of vibration mode, during **1/1 OCTAVE** or **1/3 OCTAVE** analysis only the **HP** filter is available (cf. Appendix D).



SPECTRUM (1) window with FILTER position not accessible in vibration mode

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

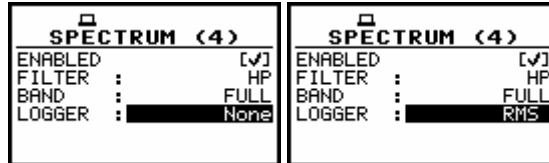
The **BAND** position enables the user to select the band in which **1/1 OCTAVE** or **1/3 OCTAVE** analysis of the signal has to be performed. Available values of the bands of the analysis are as follows: **AUDIO**, **FULL** in the case of sound measurements, **FULL** in the case of vibration measurements. 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.



SPECTRUM windows with BAND not accessible in VM (a) and BAND selection in SM (b)

5.9.4 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. The activation of this option is made by selecting the **RMS** text in the **LOGGER** position. (If the **LOGGER** functionality has been 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 (4) windows with **LOGGER** selection