A. REMOTE CONTROL

The **USB 1.1** interface is the serial one working with 12 MHz clock. Its speed is relatively high and it ensures the common usage of USB in all produced nowadays Personal Computers.

The **HOST USB** functionality is also available. The USB HOST controller installed in the instrument enables the user to connect to this meter the USB memory sticks, USB hard disks, USB printers etc.

The **RS 232 interface** is also available but as an option. In order to activate this option the user has to by a special cable with a programmed processor. This interface complies with CCIT V.24 standard. Practically all Personal Computers can be linked to the instrument by means of this interface. The maximum available transmission speed is equal to 115200 bits / sec.

The functions which are developed in order to control data flow in the serial interface ensure:

- bi-directional data transmission,
- remote control of the instrument.

The user, in order to programme the serial interface, has to:

1. send "the function code",
2. send an appropriate data file

or

3. receive a data file.

A.1. Input / output transmission types

The following basic input / output transmission types (called functions) are available:

#1 input / output of the control setting codes,

#2 output of the measurement data in the sound level meter (**SLM**) or vibration level meter (**VLM**) mode,

#3 output of the measurement data in **1/1 OCTAVE** or **1/3 OCTAVE** mode,

#4 read out the data file from the internal Flash-disc and/or the special file located in the RAM memory,

#5 read out the statistical analysis results,

#6 remote setting of the user filters,

#7 special control functions,

#9 send the setup file to the internal Flash-disc.

A.2. Function #1 – input / output of the control setting codes

Function #1 enables the user to send the control setting codes to the instrument and read out a file of the current control state. A list of the control setting codes is given in Tab. A.1.

The format of **#1** is defined as follows:

#1,Xccc,Xccc,(...),Xccc;

or

#1,Xccc,X?,Xccc,(...),X?,Xccc;

where:

X - the group code, **ccc** - the code value,

X? - the request to send the current X code setting.

The instrument will output a control settings file for all requests **X?** in the following format:

#1,Xccc,Xccc,(...),Xccc;

In order to read out all current control settings the user should send to the device the following characters:

#1;

The instrument will output a control settings file in the format:

#1,Xccc,Xccc,(...),Xccc;

Example: The following sequence of characters:

#1,U958,N4000,Z0:1,Z0:2,Z0:3,Z1:4,M3,Y1000,Xa1,Xv1,Xd1,XA0,XR0,S0;

means that:

- the **SVAN 958** is investigated (U958),
- the unit's number is **4000** (N4000),
- the **Vibration Level Mode** is selected in channel 1 (Z0:1),
- the **Vibration Level Mode** is selected in channel 2 (Z0:2),
- the **Vibration Level Mode** is selected in channel 3 (Z0:3),
- the **Sound Level Mode** is selected in channel 4 (Z1:4),
- the **1/3 OCTAVE analyser** function is selected (M3),
- the measurement start delay is equal to **1000** milliseconds (Y1000),
- the reference level for acceleration measurement is set to **1 μms^{-2}** (Xa1),
- the reference level for velocity measurement is set to **1 nms^{-1}** (Xv1),
- the reference level for displacement measurement is set to **1 pm** (Xd1),
- the AutoSave option is switched off (XA0),
- the RAM file will not be created (XR0),
- the instrument is in the **STOP** state (S0).

Note: *All bytes of that transmission are ASCII characters.*

Note: Any setting can be changed only when the instrument is in the STOP state (S0).

A.3. Function #2 – read-out of the measurement results in the SLM or VLM mode

Function **#2** enables one to read out the current measurement data in the **SLM** or **VLM** Mode.

Notice: *This function can also be programmed while measurements are taking place. In this case, the RMS values measured* ***after entering #2 function*** *will be sent out.*

#2 function has a format defined as follows:

#2,p,X?,X?,X?,(...),X?;

where:

X - the code of the result,
p - the number of the results set
0 – for reading vibration dose results
1,2,3,..,12 – for reading profile results
(calculated from the formulae: *ChannelNumber + 4 * (ProfileNumber - 1)*

Notice: *After entering the **STOP** condition, #2 function is no longer active and has to be reprogrammed in order to read-out successive measurements.*

The instrument will send the values of the results in the format defined as follows:

#2,p,Xccc,Xccc,Xccc,(...),Xccc; (where **p** - the number of the results set)

or

#2,?; (when the results are not available).

The codes of the results in the case of **SLM** mode are defined as follows:

T time of the measurement (ccc – value in seconds);
V the overload flag (ccc equals to 0 or 1);
P the **PEAK** value (ccc – the value in dB);
M the **MAX** value (ccc – the value in dB);
N the **MIN** value (ccc – the value in dB);
S the **SPL** value (ccc – the value in dB);
R the **LEQ** value (ccc – the value in dB);
U the **SEL** result (ccc – the value in dB);
B(k) the **Lden** result (ccc – the value in dB);
Y the **Ltm3** result (ccc – the value in dB);
Z the **Ltm5** result (ccc – the value in dB);
L(nn) the value **L** of the **nn** statistics (ccc – the value in dB).

Notice: *The value displayed on the screen during the result's presentation will be sent out from the instrument in the case when after the **X** code the **nn** is not given.*

Notice: *For profiles 2 and 3 the **L(nn)** result is not calculated.*

Notice: *The presented above order of the measurement results sent out by the instrument does not depend on the order of the characters sent to the unit.*

Notice: *In the case of **Lden**, the value **k** placed in the parenthesis after the code **B**, denotes the kind of the currently measured result. The kind of the **Lden** result depends on the time during which the measurements were performed (**d** denotes day, **e** denotes evening and **n** denotes night). The corresponding values of k parameter and the kind of the measured **Lden** result are presented below:*

***k** = 1* ***Ld** result,*
***k** = 2* ***Le** result,*
***k** = 3* ***Lde** result,*
***k** = 4* ***Ln** result,*
***k** = 5* ***Lnd** result,*
***k** = 6* ***Len** result,*
***k** = 7* ***Lden** result.*

Example: After sending to the instrument the following string:

#2,1,T?,V?,B?,P?,M?,R?,L50?;

one should receive the answer given below:

#2,1,T3,V0,P66.91,M64.55,R61.70,B(2)66.70,L(50)54.95;

The codes of the results in the case of **SOUND DOSIMETER** mode are defined as follows:

T time of the measurement (ccc – value in seconds);
V the overload flag (ccc equals to 0 or 1);
P the **PEAK** value (ccc – the value in dB);
M the **MAX** value (ccc – the value in dB);
N the **MIN** value (ccc – the value in dB);
S the **SPL** value (ccc – the value in dB);
D the **DOSE** value (ccc – the value in %);
d the **DOSE8h** value (ccc – the value in %);
A the **LAV** value (ccc – the value in dB);
R the **LEQ** value (ccc – the value in dB);
U the **SEL** result (ccc – the value in dB);
u the **SEL8** value (ccc – the value in dB);
E the **E** value (ccc – the value in Pa^2h);
e the **E8h** value (ccc – the value in Pa^2h);
I the **LEPd** value (ccc – the value in dB);
J the **PSEL** value (ccc – the value in dB);
Y the **Ltm3** result (ccc – the value in dB);
Z the **Ltm5** result (ccc – the value in dB);
L(nn) the value **L** of the **nn** statistics (ccc – the value in dB).

The codes of the results in the case of **VLM** mode are defined as follows:

T time of the measurement (ccc – value in seconds);
V the overload flag (ccc equals to 0 or 1);
P the **P–P** value (ccc – the value in dB);
Q the **PEAK** value (ccc – the value in dB);
M the **MTVV** value (ccc – the value in dB);
R the **RMS** value (ccc – the value in dB);
H the **VDV** value (ccc – the value in dB);
v the **VEC** value (ccc – the value in dB).

Example: After sending to the instrument the string:

#2,1,T?,V?,P?,R?;

one should receive the following answer:

#2,1,T3,V0,P76.92,R64.50;

The codes of the results in the case of **Vibration Dose** mode are defined as follows:

a the **Current Dose** value (ccc – the value in dB);
b the **Daily Dose value** (ccc – the value in dB);
c the **Current Exposure** value (ccc – the value in dB);
f the **Daily Exposure** value (ccc – the value in dB);
g the **EAV Time** value (ccc – value in seconds);

h time left to reach **EAV** value (ccc – value in seconds);

i the **ELV Time** value (ccc – value in seconds);

j time left to reach **ELV** value (ccc – value in seconds).

Example: After sending to the instrument the string:

#2,0,c?,f?,g?,h?;

one should receive the following answer:

#2,0,c-27.89,f-13.44,g172800,h172800,i172800,j172800;

Notice: *All bytes of that transmission are ASCII characters.*

A.4. Function #3 – read-out of the measurement results in 1/1 OCTAVE and 1/3 OCTAVE mode

Function **#3** enables one to read out the current measurement data in **1/1 OCTAVE**, **1/3 OCTAVE**.

#3 function format is defined as follows:

#3,n;

where: **n** – the number of channel (1, 2, 3, or 4)

The device will respond, sending the last measured spectrum (when in STOP state) or currently measured spectrum (in RUN state) in the following format:

#3,n;<Status Byte> <LSB of the transmission counter> <MSB of the transmission counter> <data byte> (...) <data byte>

Status Byte gives the information about the current state of the instrument.

D7	D6	D5	D4	D3	D2	D1	D0

where:

D7 = 1 denotes "overload indicator",

D6 = 1 denotes "averaged spectrum",

D5 = 0 the instantaneous current result (RUN State),

= 1 the final result (STOP State),

D0 to D4 reserved bits.

Note: *The measurement result is coded in binary form as dB•100 (e.g. 34.5 dB is sent as binary number 3450).*

A.5. Function #4 – read-out of the data file from the internal flash-disc and/or the special file located in the RAM memory

Function **#4** enables the user to read-out the data file from the internal Flash-disc memory. The data file formats are given in Appendix B.

#4 function formats are defined as follows:

#4,0,\; the file containing the catalogue,

#4,1,FILE NAME; the file containing the measurement results or saved setup,
#4,1,FILE NAME,addr; the file containing the measurement results or saved setup,
#4,2,Bnnn; the file containing logger,
#4,3; the special file contained in the RAM memory (**RAMfile**),

where:

FILE NAME not longer than eight-character name,
addr is the logical address of the file in the internal Flash-disc memory,
nnn the number of the logger file (one or more digits - depends on requirements).
RAMfile the special name for the file contained in the RAM memory, may be used also with the format: **#4,1,RAMfile;**

Notice: The "\" character is the obligatory catalogue file name *(it must be sent to the instrument).*

The device will respond sending the specified file/catalogue in the following format:

#4,k;<4 bytes giving the file size (in binary form)><data byte>...<data byte>

where character **k** corresponds to the file type:

0 for the file containing the catalogue,
1 for the file containing the measurement results or saved setup,
2 for the file containing the logger file.

All data words are sent as **<LSB>**,**<MSB>**.

When an error is detected in the file specification or data, the instrument will send: **#4,?;**

The catalogue of the files is a set of the records containing 16 words (16 bits each). Each record describes one file saved in the instrument's Flash-disc. The record structure is as follows:

words 0 - 3 8 character file name,
word 4 file type (binary number),
word 5 reserved,
word 6 least significant word of the file size,
word 7 most significant word of the file size,
word 8 least significant word of the file logical address,
word 9 most significant word of the file logical address,
word 10 measurement start date,
word 11 measurement start time,
words 12 - 15 reserved.

For logger and the RAMfile the **logical address** is always set to 0.

For files containing saved setup measurement start date and time are always set to 0.

Notice: *If the **DEFRAGMENTATION** function is performed after the read out of the files catalogue the logical addresses of the files could be wrong.*

The measurement **start date** is coded as a word with bits:

b15 ... b3 b2 b1 b0

where:

b15 b14 b13 b12 b11 b10 b9 is a year minus 2000.

b8 b7 b6 b5 is a month (1..12),

b4 b3 b2 b1 b0 is a day (1..31).

The measurement **start time** is coded as number of seconds counted from 00:00:00 divided by 2.

The structure of the files containing the measurement results, saved setups and/or logger files is described in details in Appendix B.

A.6. Function #5 – read-out of the statistical analysis results

Function **#5** enables one to read out the statistical analysis results. This function is available only for channels in sound level meter mode.

#5 function format is defined as follows:

#5,p;

where:

p the number of the channel (1, 2, 3 or 4)
or the number of channel plus 4 (5, 6, 7 or 8) for the read out of the statistics in **1/1 OCTAVE** or **1/3 OCTAVE** analysis.

Notice: *Statistical analysis is always performed in profile 1.*

The device will respond, sending the current statistics in the following format:

#5,p;<Status Byte> <LSB of the transmission counter> <MSB of the transmission counter> <NofClasses><BottomClass><ClassWidth><Counter of the class> (...) <Counter of the class>

Status Byte gives the information about the current state of the instrument.

D7	D6	D5	D4	D3	D2	D1	D0

where:

D7 = 1 denotes "overload indicator",

D6 = 1 reserved,

D5 = 0 the instantaneous current result (RUN State),

= 1 the final result (STOP State),

D0 to D4 reserved bits.

Notice: *There is not any succeeding transmission in the case when the* ***Status Byte*** *is equal to 0.*

The **transmission counter** is a two-byte word denoting the number of the remaining bytes to be transmitted. Its value is calculated from the formulae:

Transmission counter = 6+n * (4 * the number of the classes in the histogram)

where:

n the number of the transmitted histograms. For p = 1, 2, 3 or 4 only one histogram is transmitted (n = 1). For p between 5 and 8 the number of the transmitted histograms depends on the measurement function and

- in the case of **1/1 OCTAVE** analysis n is equal to the number of the analysis results (NOct – cf. App. B) plus the number of the TOTAL values for this type of analysis (NOctTot);

- in the case of **1/3 OCTAVE** analysis n is equal to the number of the analysis results (NTer – cf. App. B) plus the number of the TOTAL values for this type of analysis (NTerTot);

NofClasses is a two-byte word denoting the number of classes in the histogram.

BottomClass is a two-byte word denoting the lower limit of the first class (*10 dB).

ClassWidth is a two-byte word denoting the width of the class (*10 dB).

Counter of the class is a four-byte word containing the number of the measurements belonging to the current class.

Notice: *The bytes in the words are sent according to the scheme <LSByte>..<MSByte>.*

A.7. Function #6 – remote setting of the user filters

Function **#6** enables one to send to the instrument the coefficients of the user filters. In the available formats description of **#6** functions the following symbols are used:

type	- 0 for the vibration filters,
	- 1 for the acoustic filters,
name, **name$_1$**, **name$_2$**	- filter names given by the user,
v	- real type value, expressed in [dB],
first	- integer type value (number of the coefficient in the user filter),
pos	- integer type value (Total value number),
avd	- for the vibration filters: 0 - Acc, 1- Vel, 2 - Dil,
	- for the acoustic filters this parameter is always equal to 0,
cal	- the calibration coefficient given as the real number expressed in [dB].
chn	- channel number (1, 2, 3 or 4).

#6 function formats are defined as follows:

#6,type,L;

This function returns the list of the defined (existing in the instrument) filters in the following format: **#6,type,n,name$_1$, ... ,name$_n$;**

#6,type,W,name,v,v,...,v;

This function sets the coefficients of the new user filter named as **name**. The **name** parameter should be unique (in the instrument there is not any other filter with the same name, otherwise it will be an error). The function answers in the format: **#6;**

#6,type,R,name;

This function returns the coefficients of the user filter named as **name**. If the **name** filter does not exist, an error occurs. The function returns in the following format: **#6,type,n,v$_1$,v$_2$, ... ,v$_n$;**

#6,type,D,name;

This function deletes from the instrument the user filter named as **name**. If the **name** filter does not exist, an error occurs. The function answers in the format: **#6;**

#6,type,S,name,v,v,...,v;

This function sets the user filter named as **name**. If the **name** filter already exists, its coefficients are redefined. If the **name** filter does not exist, the filter is created. The function answers in the format: **#6;**

#6,type,C,name,first,v,v,...,v;

This function sets the coefficients in the user filter named as name starting from the first position. If the **name** filter does not exist, an error occurs. The function answers in the format: **#6;**

#6,type,N, name$_1$, name$_2$;

This function changes the name of the user filter from **name$_1$** to **name$_2$**. The function answers in the format: **#6;**

#6,type,@,chn,L;

This function returns the names of the user filters, assigned to the channel **chn** consecutive **TOTAL** values, in the following format: **#6,type,chn,3,name$_1$,name$_2$,name$_3$;**

#6,type,@,chn,pos,?;

This function returns the description record of the user filter assigned to the **pos TOTAL** value of channel **chn** in the following format: **#6,type,@,chn,pos,name,avd,cal;** (the description record contains: the name of the filter, its type and the calibration coefficient).

#6,type,@,chn,pos,*;

This function recovers the predefined filter for the **pos TOTAL** value of channel **chn** and returns the following format: **#6,type,@,chn,pos,name,avd,cal;**

#6,type,@,chn,pos,name,avd,cal;

This function sets the description record of the user filter assigned to the **pos TOTAL** value of channel **chn** in the following format: **#6,type,@,chn,pos,name,avd,cal;**

The returned parameters: **name**, **avd** and **cal** are set in the description record after the execution of the function. In the case of an error they can differ from the current parameters of the function.

Notice: *In the case of an error all these functions return the following sequence of the characters:* ***#6?;***

A.8. Function #7 – special control functions

Function **#7** enables the user to perform special control functions. **Some of them should be used with the extreme care.**

#7 function formats are defined as follows:

#7,CB;

This function clears the logger memory - all logger files will be deleted. The function returns **#7,CB;** This function is not accepted while the instrument is in the RUN state.

#7,BF;

This function returns internal logger memory free space in the format:
#7,BF,ddddd; (**ddddd** - number of bytes in decimal format).

#7,BN;

This function returns the number of logger files created to the current time in the format: **#7,BN,ddddd;** (**ddddd** - number of logger files in decimal format).

#7,RT;

This function returns current real time clock settings in the format:
#7,RT,hh,mm,ss,DD,MM,YYYY;
where **hh:mm:ss** denotes the time and **DD/MM/YYYY** gives the date.

#7,RT,hh,mm,ss,DD,MM,YYYY;

This function sets the current real time clock and returns the following sequence of characters: **#7,RT;**

#7,AS;

This function returns current real time and date settings for the AutoStart function in the format: **#7,AS,e,hh,mm,ss,DD;** where e=1 if AutoStart function is switched ON or 0 if it is switched OFF, **hh:mm:ss** gives the time and **DD** gives the day for the current date.

#7,AS,e,hh,mm,DD;

This function uses the given time and date settings for AutoStart function and returns the following sequence of characters: **#7,AS;**

#7,SS;

This function saves the current settings of the instrument in the EEPROM memory. The function returns the following sequence of characters: **#7,SS;**
This function is not accepted and not performed while the instrument is in the RUN state.

#7,DA;

This function deletes all files containing measurement results and instrument's settings from the internal flash memory. The function returns the following sequence of characters: **#7,DA;**
This function is not accepted and not performed while the instrument is in the RUN state.

#7,DF;

This function deletes all files containing measurement results from the internal flash memory. The function returns the following sequence of characters: **#7,DF;**
This function is not accepted and not performed while the instrument is in the RUN state.

#7,DF,fileName;

This function deletes file named **fileName** containing measurement results from the internal flash memory. The function returns the following sequence of characters: **#7,DF;**
This function is not accepted and not performed while the instrument is in the RUN state.

#7,DF,fileName<iAddr;

This function deletes file located at internal address **iAddr** containing measurement results from the internal flash memory. The function returns the following sequence of characters: **#7,DF;**
This function is not accepted and not performed while the instrument is in the RUN state.

#7,DS;

This function deletes all files containing instrument's settings from the internal flash memory. The function returns the following sequence of characters: **#7,DS;**
This function is not accepted and not performed while the instrument is in the RUN state.

#7,DS,fileName;

This function deletes file named **fileName** containing instrument's settings from the internal flash memory. The function returns the following sequence of characters: **#7,DS;**
This function is not accepted and not performed while the instrument is in the RUN state.

#7,DS,fileName<iAddr;

This function deletes file containing instrument's settings located at internal address **iAddr** from the internal flash memory. The function returns the following sequence of characters: **#7,DS;**

This function is not accepted and not performed while the instrument is in the RUN state.

#7,AN,FName;

This function sets the name of the file for the Autosave function as the **FName**. The given name has to start with the '@' character and contain no more than 8 characters. The function returns the following sequence of characters: **#7,AN;**

This function is not accepted and not performed while the instrument is in the RUN state.

#7,AN;

This function returns current file name used by Autosave function in the format: **#7,AN,FName;**.

This function is not accepted and not performed while the instrument is in the RUN state.

#7,AV;

This function returns analyser firmware version in the format **#7,AV,XX.XX.XXC;** where XX.XX.XX is firmware version, C – firmware subversion.

#7,BS;

This function returns battery charge level in the format **#7,BS,nn;** where nn is a percent value. When battery state is not available (i.e. unit is powered from external source) function returns **#7,BS,-1;**.

Notice: *For the unknown function and/or in the case of the other error, all these functions return the following sequence of characters:* ***#7,?;***

A.9. Function #9 – writing setup files to the internal flash-disc

Function #9 allows uploading files containing instrument setup to the internal Flash-disc. The function expects files in format described in Appendix B, paragraph B.9. **Function should be used with extreme care.**

The #9 function format is defined as follows:

#9,2,Len,<data byte> ... <data byte>

where:

Len - length of transferred file in bytes as ASCII,

<data byte> - byte of data in binary form.

Function responds with "**#9,1;**" on success and with "**#9,0;**" on failure.

A.10. Control setting codes

The control setting codes used in the **SVAN 958** instrument (starting from the internal software version 3.6.1) are given in the table below.

Table A.1. Control setting codes

Group name	Group code	Code description
Unit type	**U**	U958 (read only)
Serial number	**N**	Nxxxx (read only)
Software version number * 100	**W**	WLxxx xxx - Meter version number * 100 (read only) Wxxx xxx - Analyzer version number * 100 (read only)
Microphone field correction	**H**	H0:n - **Free** field in channel n H1:n - **Diffuse** field in channel n
Channel mode	**Z**	Z0:n - Vibration LM / Analyzer for channel n Z1:n - Sound Level Meter / Analyzer for channel n
Calibration factor	**Q**	Qnnnn:c nnnn - real number with the value of the calibration factor for channel c in dB ∈ (-99.9 ÷ 99.9)
Measurement function	**M**	M1 - **Level Meter** M2 - **1/1 OCTAVE analyser** M3 - **1/3 OCTAVE analyser** M4 - **Sound dosimeter** M6 - **FFT analyser** M8 - **Reverberation Time (RT60)** M17 - **Wave recorder**
Execution of **1/1 OCTAVE**, **1/3 OCTAVE** or **FFT** analysis in channel n	**e**	e0:n - Spectrum analysis in channel n disabled e1:n - Spectrum analysis in channel n enabled
Range of channel n	**R**	R1:n - **105 dB** (**SLM**) or **17.8 ms^{-2}** (**VLM**) R2:n - **130 dB** (**SLM**) or **316 ms^{-2}** (**VLM**)
Results displayed on the screen	**P**	P1 - **CHANNEL 1, PROFILE 1** (read only) P2 - **CHANNEL 2, PROFILE 1** (read only) P3 - **CHANNEL 3, PROFILE 1** (read only) P4 - **CHANNEL 4, PROFILE 1** (read only) P5 - **CHANNEL 1, PROFILE 2** (read only) P6 - **CHANNEL 2, PROFILE 2** (read only) P7 - **CHANNEL 3, PROFILE 2** (read only) P8 - **CHANNEL 4, PROFILE 2** (read only) P9 - **CHANNEL 1, PROFILE 3** (read only) P10- **CHANNEL 2, PROFILE 3** (read only) P11 - **CHANNEL 3, PROFILE 3** (read only) P12 - **CHANNEL 4, PROFILE 3** (read only)
Filter type in profile for **SLM**	**F**	F1:m **LIN** filter for profile m F2:m **A** filter for profile m F3:m **C** filter for profile m F4:m **G** filter for profile m m = ChannelNo + 4 * (ProfileNo - 1)

Filter type in **1/1 OCTAVE** or **1/3 OCTAVE** analysis in channel n for **SLM**	**f**	f0:n - **HP** filter in channel n f1:n - **LIN** filter in channel n f2:n - **A** filter in channel n f3:n - **C** filter in channel n
Filter type in **FFT** analysis in channel n for **SLM**	**j**	j0:n - **HP** filter in channel n j1:n - **LIN** filter in channel n j2:n - **A** filter in channel n j3:n - **C** filter in channel n
Filter type in **1/1 OCTAVE** or **1/3 OCTAVE** analysis in channel n for **VLM**	**i**	i0:n - **HP** filter in channel n (read only)
Filter type in **FFT** analysis in channel n for **VLM**	**k**	k0:n - **HP** filter in channel n (read only)
Filter type in profile for **VLM**	**I**	I1:m **HP1** filter for profile m I2:m **HP3** filter for profile m I3:m **HP10** filter for profile m I4:m **Vel1** filter for profile m I5:m **Vel3** filter for profile m I6:m **Vel10** filter for profile m I7:m **VelMF** filter for profile m I8:m **Dil1** filter for profile m I9:m **Dil3** filter for profile m I10:m **Dil10** filter for profile m I11:m **W–Bxy** filter for profile m I12:m **W–Bz** filter for profile m I13:m **H–A** filter for profile m I14:m **W–Bc** filter for profile m I15:m **KB** filter for profile m I16:m **Wk** filter for profile m I17:m **Wd** filter for profile m I18:m **Wc** filter for profile m I19:m **Wj** filter for profile m I20:m **Wm** filter for profile m I21:m **Wh** filter for profile m I22:m **Wg** filter for profile m I23:m **Wb** filter for profile m m = ChannelNo + 4 * (ProfileNo - 1)
Detector type in profile for **SLM**	**C**	C0:m - **IMPULSE** detector in profile m C1:m - **FAST** detector in profile m C2:m - **SLOW** detector in profile m m = ChannelNo + 4 * (ProfileNo - 1)
Detector type in profile for **VLM**	**E**	E0:m - **100 ms** detector in profile m E1:m - **125 ms** detector in profile m E2:m - **200 ms** detector in profile m E3:m - **500 ms** detector in profile m E4:m - **1 s** detector in profile m E5:m - **2 s** detector in profile m E6:m - **5 s** detector in profile m E7:m - **10 s** detector in profile m m = ChannelNo + 4 * (ProfileNo - 1)

Logger type in profile in the case of **SLM**	**B**	B0:m - **None** logger in profile m Bxx:m - xx - sum of values for profile m: 1 – logger with **PEAK** values 2 – logger with **MAX** values 4 – logger with **MIN** values 8 – logger with **RMS** values m = ChannelNo + 4 * (ProfileNo - 1)
Storing the results of **1/1 OCTAVE** or **1/3 OCTAVE** analysis in channel n in logger file in the case of **SLM**	**b**	b0:n - switched off (**None**) in channel n b4:n - switched on (**RMS/LEQ**) in channel n
Storing the results of **FFT** analysis in channel n in logger file	**v**	v0:n - switched off (**none**) in channel n v4:n - switched on (**RMS**) in channel n (read only)
Logger type in profile in the case of **VLM**	**G**	G0:m - **None** logger in profile Gxx:m - xx - sum of values for profile m: 1 – logger with **PEAK** values 2 – logger with **P–P** values 4 – logger with **MAX** values 8 – logger with **RMS** values 16 – logger with **VDV** values m = ChannelNo + 4 * (ProfileNo - 1)
Storing the results of **1/1 OCTAVE** or **1/3 OCTAVE** analysis in channel n in logger file	**g**	g0:n - switched off (**none**) in channel n g4:n - switched on (**RMS**) in channel n
Logger time step	**d**	dnnnn - nnnn number in milliseconds ∈ (**10**, **20**, **50**, **100**, **200**, **500**, **1000**) dnns - nn number in seconds ∈ (1 ÷ 60) dnnm - nn number in minutes ∈ (1 ÷ 60)
Integration time	**D**	D0 “infinite” number Dnns nn number in seconds Dnnm nn number in minutes Dnnh nn number in hours
Repetition cycle	**K**	K0 - infinity (measurement stopped when the STOP button is pressed or when remote setting S0 is received) Knnnn -nnnn number of repetitions ∈ (1 ÷ 1000)
Detector type in the **LEQ** (for **SLM**) and/or **RMS** (for **VLM**) function	**L**	L0 - **LINEAR** L1 - **EXPONENTIAL**
Band of the **FFT** analysis in channel n	**r**	r1:n - **22.4 kHz** band of **FFT** analysis in channel n r2:n - **11.2 kHz** band of **FFT** analysis in channel n r3:n - **5.6 kHz** band of **FFT** analysis in channel n r4:n - **2.8 kHz** band of **FFT** analysis in channel n r5:n - **1.4 kHz** band of **FFT** analysis in channel n r6:n - **700 Hz** band of **FFT** analysis in channel n r7:n - **350 Hz** band of **FFT** analysis in channel n r8:n - **175 Hz** band of **FFT** analysis in channel n r9:n - **87.5 Hz** band of **FFT** analysis in channel n
Lines in **FFT** analysis in channel n	**u**	u0:n - **1920** lines in channel n u1:n - **960** lines in channel n u2:n - **480** lines in channel n
Window in the **FFT** analysis in channel n	**w**	w0:n - **HANNING** in channel n w1:n - **RECTANGLE** in channel n w2:n - **FLAT TOP** in channel n w3:n - **KAISER–BESSEL** in channel n

Averaging in the **FFT** analysis in channel n	**a**	a0:n - **LINEAR** in channel n
Trigger Mode (TriggerMode)	**m**	m0 - **OFF** m1 - **SLOPE +** m2 - **SLOPE –** m3 - **LEVEL +** m4 - **LEVEL –** m5 - **LOGGER** m6 - **GRAD +** m7 - **RTC**
Source of the triggering signal for measurement functions: M1 and M6 (TriggerSource)	**s**	s0 - Vector value s1 - Vector and sound value s2 - **RMS** value from profile 1 s3 - External trigger
Channel of the triggering signal	**c**	c1 - channel 1 c2 - channel 2 c3 - channel 3 c4 - channel 4
Source of the triggering signal for measurement function M2 with the selection TriggerMode=LOGGER (TriggerOctSource)	**o**	o0 - Vector value o1 - Vector and sound value o2 - **RMS** from profile 1 value o3 - External trigger onn - nn number of the filter in **1/1 OCTAVE** spectra $\in$ (8 ÷ NOct), respectively: 8 - 125 Hz, 9 - 250 Hz, ..., 15 - 16 kHz; NOct = 15 - number of filters in **1/1 OCTAVE** analysis
Source of the triggering signal for measurement function M3 with the selection TriggerMode=LOGGER (TriggerTerSource)	**t**	t0 - Vector value t1 - Vector and sound value t2 - **RMS** from profile 1 value t3 - External trigger tnn - nn filter's number in **1/3 OCTAVE** spectra $\in$ (23 ÷ NTer), respectively: 23 - 125 Hz, 24 - 160 Hz, , 45 - 20 kHz; NTer = 45 - number of filters in **1/3 OCTAVE** analysis
SLM's trigger level (TriggerLev)	**l**	lxxx - xxx level given in dB $\in$ (24 ÷ 136)
VLM's trigger level (TriggerLev)	**n**	nxxx - xxx level given in dB $\in$ (60 ÷ 200)
VLM's vector trigger level (VecTriggerLev)	**h**	hxxx - xxx level given in dB $\in$ (60 ÷ 200)
Number of the records from the logger taken into account before the fulfilment of the triggering condition (TriggerPre)	**p**	pnn - nn number of the records taken into account before the fulfilment of the triggering condition $\in$ (0 ÷ 20)
Number of the records from the logger taken into account after the fulfilment of the triggering condition (TriggerPost)	**q**	qnn - number of the records taken into account after the fulfilment of the triggering condition $\in$ (0 ÷ 200)
Delay in the start of measurement	**Y**	Ynn nn delay given in milliseconds $\in$ (0 ÷ 60000)
Reference level for acceleration (RefLev_a)	**Xa**	Xannn nnn reference level for acceleration given in $\mu ms^{-2} \in$ (1 ÷ 100)
Reference level for velocity (RefLev_v)	**Xv**	Xvnnn nnn reference level for velocity given in $nms^{-1} \in$ (1 ÷ 100)

Reference level for displacement (RefLev_d)	**Xd**	Xdnnn nnn reference level for displacement given in pm ∈ (1 ÷ 100)
AutoSave option	**XA**	XA0 - switched OFF XA1 - switched ON, file names are numbered
Saving results of statistical analysis	**XS**	XS0 - switched off XS1 - switched on
Using the RAMfile instead of the flash disk while storing results with the AutoSave option switched on	**XR**	XR0 - switched OFF XR1 - switched ON
Extended I/O Mode	**x**	x0 - **AC/Int.** in **Analogue** mode x1 - **AC/Int.** in **Digital In** mode x2 - **AC/Int.** in **Digital Out** mode
External I/O Channel for analogue **AC/Int.** mode	**y**	yn - n - channel number between 1 and 4
State of the instrument (Stop or Start)	**S**	S0 - **STOP** S1 - **START**
Menu lock mode	**Xb**	Xb0 - menu unlocked Xb1 - menu partially locked Xb2 - menu fully locked
Channel selection for vibration vector calculation	**XB**	XB0:n - channel n is not included in vector XB1:n - channel n is included in vector
Channel coefficient for vector calculation	**XC**	XCxx:n - xx - value of coefficient *100 ∈ (0 ÷ 200) - n - channel number
Storing vector in logger file	**XD**	XD0 - switched OFF XD1 - switched ON
Measurement of vibration dose	**XE**	XE0 - switched OFF XE1 - switched ON
Vibration dose exposure time	**XF**	XFnn nn - time in minutes ∈ (0 ÷ 1440)
Vibration dose standard	**XG**	XG0 - Great Britain XG1 - Italy XG2 - Poland XG3 - French XG4 - user defined
X axis for vibration dose measurement	**XH**	XHn n - channel number (1..4)
Y axis for vibration dose measurement	**XI**	XIn n - channel number (1..4)
Z axis for vibration dose measurement	**XJ**	XJn n - channel number (1..4)
Outdoor microphone correction for channel n	**XK**	XK0:n - outdoor correction is OFF XK1:n - outdoor correction is ON
Expose time for dosimeter	**XL**	XLnn nn - time given in minutes
Criterion Time level for dosimeter	**XM**	XM0 - 80 dB XM1 - 84 dB XM2 - 85 dB XM3 - 90 dB

Threshold level for dosimeter	**XN**	XN0 - none XN1 - 75 dB XN2 - 80 dB XN3 - 85 dB XN4 - 90 dB
Exchange Rate level for dosimeter	**XO**	XOnn nn - level given in dB ∈ [2,5]
Spectrum **MAX** store	**XT**	XT0 spectrum **MAX** switched OFF XT1 spectrum **MAX** switched ON
Spectrum **MIN** store	**Xt**	Xt0 spectrum **MIN** switched OFF Xt1 spectrum **MIN** switched ON
Trigger gradient level for **SLM**	**Xg**	Xgnn - nn – gradient level in dB/ms ∈ [1,100]
Trigger gradient level for **VLM**	**Xh**	Xgnn - nn – gradient level in dB/ms ∈ [1,100]
RTC trigger start time	**Xr**	Xrnn - nn – time in seconds ∈ [0,86399]
RTC trigger step time	**Xs**	Xs0 - use integration time for step Xsnn - nn – step in seconds ∈ [1,86400]
Function for Digital In **AC/Int.** mode	**XP**	XP0 - trigger pulse
Function for Digital Out **AC/Int.** mode	**XQ**	XQ0 - trigger pulse XQ1 - alarm pulse
AC/Int. polarization	**XU**	XU0 - positive XU1 - negative
AC/Int. active level	**XV**	XV0 - active low XV1 - active high
Vector alarm mode	**Xc**	Xc0:0 - **OFF** Xc1:0 - **SLOPE +** Xc2:0 - **SLOPE –**
Vector alarm step	**Xe**	Xe0:0 - logger step Xe1:0 - 100 ms Xe2:0 - 1 s Xe3:0 - integration period
Vector alarm level	**Xf**	Xfnnn:0 - nnn alarm level in dB*10
Profile alarm mode for **VLM**	**Xi**	Xi0:P:K - **OFF** Xi1:P:K - **SLOPE +** Xi2:P:K - **SLOPE –** P - profile number K - number of alarm in profile
Profile alarm mode for **SLM**	**Xj**	Xj0:P:K - **OFF** Xj1:P:K - **SLOPE +** Xj2:P:K - **SLOPE –** P - profile number K - number of alarm in profile
Integration period for **VLM** profile alarm	**Xk**	Xk0:P:K - logger step Xk1:P:K - 100 ms Xk2:P:K - 1 s Xk3:P:K - integration period P - profile number K - number of alarm in profile

Integration period for **SLM** profile alarm	**Xl**	Xl0:P:K - logger step Xl1:P:K - 100 ms Xl2:P:K - 1 s Xl3:P:K - integration period P - profile number K - number of alarm in profile
Profile alarm source for **VLM**	**Xm**	Xm1:P:K - **PEAK** Xm2:P:K - **P–P** Xm3:P:K - **MAX** Xm4:P:K - **MIN** Xm5:P:K - **RMS** Xm6:P:K - **VDV** P - profile number K - number of alarm in profile
Profile alarm source for **SLM**	**Xn**	Xn7:P:K - **PEAK** Xn8:P:K - **MAX** Xn9:P:K - **MIN** Xm10:P:K - **RMS** P - profile number K - number of alarm in profile
Profile alarm level for **VLM**	**Xo**	XoN:P:K - N – level in dB*10 P - profile number K - number of alarm in profile
Profile alarm level for **SLM**	**Xp**	XpN:P:K - N – level in dB*10 P - profile number K - number of alarm in profile
1/1 OCTAVE alarm mode for **VLM**	**XXa**	XXa0:P:K - **OFF** XXa1:P:K - **SLOPE +** XXa2:P:K - **SLOPE –** P - channel number K - number of alarm in channel
1/1 OCTAVE alarm mode for **SLM**	**XXb**	XXb0:P:K - **OFF** XXb1:P:K - **SLOPE +** XXb2:P:K - **SLOPE –** P - channel number K - number of alarm in channel
1/1 OCTAVE alarm period for **VLM**	**XXc**	XXc0:P:K - logger step XXc1:P:K - 100 ms XXc2:P:K - 1 s XXc3:P:K - integration period P - channel number K - number of alarm in channel
1/1 OCTAVE alarm period for **SLM**	**XXd**	XXd0:P:K - logger step XXd1:P:K - 100 ms XXd2:P:K - 1 s XXd3:P:K - integration period P - channel number K - number of alarm in channel
1/1 OCTAVE alarm source for **VLM**	**XXe**	XXe11:P:K - 1 Hz band … XXe25:P:K - 16 kHz band P - channel number K - number of alarm in channel

1/1 OCTAVE alarm source for **SLM**	**XXf**	XXf11:P:K - 1 Hz band ... XXf25:P:K - 16 kHz band P - channel number K - number of alarm in channel
1/1 OCTAVE alarm level for **VLM**	**XXg**	XXgN:P:K - N – level in dB*10 P - channel number K - number of alarm in channel
1/1 OCTAVE alarm level for **SLM**	**XXh**	XXhN:P:K - N – level in dB*10 P - channel number K - number of alarm in channel
1/3 OCTAVE alarm mode for **VLM**	**XXA**	XXA0:P:K - **OFF** XXA1:P:K - **SLOPE +** XXA2:P:K - **SLOPE –** P - channel number K - number of alarm in channel
1/3 OCTAVE alarm mode for **SLM**	**XXB**	XXB0:P:K - **OFF** XXB1:P:K - **SLOPE +** XXB2:P:K - **SLOPE –** P - channel number K - number of alarm in channel
1/3 OCTAVE alarm period for **VLM**	**XXC**	XXC0:P:K - logger step XXC1:P:K - 100 ms XXC2:P:K - 1 s XXC3:P:K - integration period P - channel number K - number of alarm in channel
1/3 OCTAVE alarm period for **SLM**	**XXD**	XXD0:P:K - logger step XXD1:P:K - 100 ms XXD2:P:K - 1 s XXD3:P:K - integration period P - channel number K - number of alarm in channel
1/3 OCTAVE alarm source for **VLM**	**XXE**	XXE11:P:K - 0.8 Hz band ... XXE55:P:K - 20 kHz band P - channel number K - number of alarm in channel
1/3 OCTAVE alarm source for **SLM**	**XXF**	XXF11:P:K - 0.8 Hz band ... XXF55:P:K - 20 kHz band P - channel number K - number of alarm in channel
1/3 OCTAVE alarm level for **VLM**	**XXG**	XXGN:P:K - N – level in dB*10 P - channel number K - number of alarm in channel
1/3 OCTAVE alarm level for **SLM**	**XXH**	XXHN:P:K - N – level in dB*10 P - channel number K - number of alarm in channel