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.

Note: *For reliable operation of the RS 232, proper synchronisation of the transmission by **CTS** and **RTS** lines (according to their definitions) is required.*

The **IrDA** serial interface is also available as an option. It requires dedicated hardware and the programme can be unlocked by a software code.

The functions, which are developed in order to control data flow in the serial interfaces, 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 read out of the measurement results in the sound level meter (**SLM**) mode or vibration level meter (**VLM**) mode,
#3 read out of the measurement results in **1/1 OCTAVE** or **1/3 OCTAVE** mode,
#4 read out of the data file from the internal Flash-disc,
#5 read out of the statistical analysis results.
#7 special control functions,
#9 writing the data file into the internal flash-disk.

A.2. Function #1 – Input / Output of the control setting codes

#1 function enables the user to send the control setting codes to the instrument and read out a file containing the current control state. A list of the control setting codes is given in Table A.1. The format of #1 function 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 outputs in this case a control settings file for all requests X? in the following format:

#1,X ccc,X ccc,(...),X ccc;

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

#1;

The instrument outputs in this case a file containing all control settings given in Table A1 in the format:

#1,X ccc,X ccc,(...),X ccc;

Example: The following sequence of characters send by the instrument as an answer for the mentioned above request:

#1,U957,N6909,WL6.06,W6.06.2,Q0.2,Z1,V0,M1,R2,P1,F2:1,F3:2,F3:3,f0,I3:1,I2:2,I1:3,C1:1,C0:2, C2:3,E4:1,E4:2,E4:3,B0:1,B2:2,B15:3,b0,G0:1,G15:2,G7:3,g0,d200,D1s,K5,L0,r1,w0,a0,m0,s0,o6,t17,l 75,n100,p20,q30,O25,k30,A0,e120,c2,h1,x3,y0,z0,T1,Y3,S0,Xx0,Xz0,Xc0,Xs3,Xn500,Xa1,Xv1,Xd1, XA0,XR0,XS0,XM0,Xm0,XP0,XD0,XT0,XL75,XQ25,Xq100;

means that:

- the **SVAN 957** is investigated (U957)
- serial number of the instrument is 6909 (N6909)
- the **LEVEL METER** has the software version number 6.06 (WL6.06)
- the software version is 6.06.2 (W6.06.2)
- the calibration factor is equal to 0.2 dB (Q0.2)
- the **SOUND METER** mode is selected currently (Z1)
- the **VOLTAGE** input is off (V0)
- the **LEVEL METER** is selected as the measurement function (M1)
- the range is **HIGH** (R2)
- the current displayed profile is 1 (P1)
- the **A** filter is selected in in **SLM** mode (F2:1)
- the **C** filter is selected in profile 2 in **SLM** mode (F3:2)
- and the **C** filter is selected in profile 3 in **SLM** mode (F3:3)
- the **HP** filter is selected for **1/1 OCTAVE** or **1/3 OCTAVE** analysis (f0)
- the **HP10** filter is selected in profile 1 in **VLM** mode (I3:1)
- the **HP3** filter is selected in profile 2 in **VLM** mode (I2:2)
- the **HP1** filter is selected in profile 3 in **VLM** mode (I1:3)
- the **FAST** detector is selected in profile 1 in **SLM** mode (C1:1)
- the **IMPULSE** detector is selected in profile 2 in **SLM** mode (C0:2)
- the **SLOW** detector is selected in profile 3 in **SLM** mode (C2:3)
- the detector **1.0s** is selected in profile 1 in **VLM** mode (E4:1)
- the detector **1.0s** is selected in profile 2 in **VLM** mode (E4:2)
- the detector **1.0s** is selected in profile 3 in **VLM** mode (E4:3)
- the logger is not filled by the results from profile 1 in **SLM** mode (B0:1)
- the **MAX** values are stored in the files of the logger from profile 2 in **SLM** mode (B2:2)
- the **RMS** values are stored in the files of the logger from profile 3 in **SLM** mode (B4:3)
- the results of **1/1** or **1/3 OCTAVE** analysis are not stored in the files of the logger in **SLM** mode (b0)
- the results coming from profile 1 are not saved in **VLM** mode in the logger's file (G0:1)
- the **PEAK**, **P–P**, **MAX** and **RMS** results from profile 2 are saved in the logger's file in **VLM** mode (G15:2)
- the **PEAK**, **P–P** and **MAX** results from profile 3 are saved in the logger's file in **VLM** mode (G7:3)
- the **1/1 OCTAVE** or **1/3 OCTAVE** analysis results are not saved in the logger's file in **VLM** mode (g0)
- the measurement results has to be stored in a file of the logger every 200 millisecond (d200)
- the integration time is equal to 1 second (D1s)
- the measurement has to be repeated 5 times (K5)

- the linear detector is selected to the **LEQ** calculations (L0)
- the narrow-band frequency analysis is performed in 22.4 kHz band (r1)
- the **HANNING** window is used during the analysis (w0)
- the linear averaging is used during the analysis (a0)
- the triggering is switched off (m0)
- the **SPL** result from the first profile is used as the triggering signal (s0)
- the sixth **1/1 OCTAVE** filter is treated as the triggering signal for **1/1 OCTAVE** analysis (o6)
- the value of the seventeenth **1/3 OCTAVE** filter is treated as a source of the triggering signal for **1/3 OCTAVE** analysis (t17)
- the trigger level in **SLM** mode is equal to 75 dB (l75)
- the trigger level in **VLM** mode is equal to 100 dB (n100)
- the number of the records before the triggering saved in a file of the logger is equal to 20 (p20)
- the number of records registered after the moment in which the measured signal does not fulfil any longer the condition of the triggering is equal to 30 (q30)
- the gradient in **SLM** mode in **MEASURE TRIGGER** is equal to 25 dB/ms (O25)
- the gradient in **VLM** mode in **MEASURE TRIGGER** is equal to 30 dB/ms (k30)
- the spectrum analysis is performed in a full band (A0)
- the exposure time is equal to 120 minutes (e120)
- the criterion level is equal to 84 dB (c2)
- the threshold level is equal to 75 dB (h1)
- the exchange rate is equal to (x3)
- the **FFT** analysis is performed using 1920 lines (y0)
- the **FFT** logger is switched off (z0)
- the logger is switched on (T1)
- the delay of the start of the measurements is equal to 3 seconds (Y3)
- the instrument is in the Stop state (S0)
- the **ANALOG OUT** is selected for **MODE** in the **EXT. I/O SETUP** (Xx0)
- the **TRIGGER PULSE** is selected as the **FUNCTION** in the **EXT. I/O SETUP** (Xz0)
- the **LOW** is selected as the **ACTIVE LEVEL** in the **EXT. I/O SETUP** (Xc0)
- the **PEAK** value from the first profile is selected as the **SOURCE** in the **EXT. I/O SETUP** (Xs3)
- the **ALARM LEVEL** set in the **EXT. I/O SETUP** is equal to 50.0 dB (Xn500)
- the reference level for the acceleration measurements is equal to 1 $\mu m/s^2$ (Xa1)
- the reference level for the velocity measurements is equal to 1 nm/s (Xv1)
- the reference level for the acceleration measurements is equal to 1 pm (Xd1)
- the auto save is switched off (XA0)
- the RAM file is switched off (XR0)
- the statistics are not saved (XS0)
- the saving of Max spectrum is switched off (XM0)
- the saving of Min spectrum is switched off (Xm0)
- the **REPLACE** in **SAVE OPTIONS** is switched off (XP0)
- the **DIRECT SAVE** in **SAVE OPTIONS** is switched off (XD0)
- the **TRIGGER** in the **LOGGER TRIGGER** is set to **OFF** (XT0)
- the **LEVEL** in the **LOGGER TRIGGER** is set to 75 dB (XL75)
- the **PRE** in the **LOGGER TRIGGER** is set to 25 (XQ25)
- the **POST** in the **LOGGER TRIGGER** is set to 100 (Xq100).

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

A.3. Function #2 – Measurement results read-out in the level meter or dose meter modes

#2 function enables one to read out the current measurement result from the selected profile in the sound or vibration **LEVEL METER** or **DOSE METER** modes.

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

#2 function has the format defined as follows:

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

where:
X - the code of the result,
p - the number of the profile (1, 2 or 3).

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

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

#2,p,Xccc,Xccc,Xccc,(...),Xccc; (where **p** - the number of the profile: 1, 2 or 3)

or

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

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

v the under-range flag (ccc equals to 0 when the overload did not occur, 2 when the under-range took place during the last measurement period but did not occur in the last second of the measurement and 3 when the under-range took place during the last measurement period and it lasted in the last second of the measurement);
V the overload flag (ccc equals to 0 or 1);
T time of the measurement (ccc – value in seconds);
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** result (ccc – the value in dB);
R the **LEQ** result (ccc – the value in dB).
U the **SEL** result (ccc – the value in dB);
B(k) the **Lden** result (ccc – the value in dB; k – flag determining the kind of the result);
I(nn) the **LEPd** result (ccc – the value in dB, nn – the value of Exposure Time in minutes);
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: *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.*

The codes of the results from the **DOSE METER** mode are defined as follows:

v the under-range flag (ccc equals to 0 when the overload did not occur, 2 when the under-range took place during the last measurement period but did not occur in the last second of the measurement and 3 when the under-range took place during the last measurement period and it lasted in the last second of the measurement);
V the overload flag (ccc equals to 0 or 1);
T time of the measurement (ccc – value in seconds);
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** result (ccc – the value in dB);
D the **DOSE** result (ccc – the value in %);
d the **D_8h** result (ccc – the value in %);
A the **LAV** result (ccc – the value in dB);
R the **LEQ** result (ccc – the value in dB);
U the **SEL** result (ccc – the value in dB);
u the **SEL8** result (ccc – the value in dB);
E the **E** result (ccc – the value in Pa^2h);
e the **E_8h** result (ccc – the value in Pa^2h);
I(nn) the **LEPd** result (ccc – the value in dB, nn – the value of Exposure Time in minutes);
J the **PSEL** 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).

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

v the under-range flag (ccc equals to 0 when the overload did not occur, 2 when the under-range took place during the last measurement period but did not occur in the last second of the measurement and 3 when the under-range took place during the last measurement period and it lasted in the last second of the measurement);
V the overload flag (ccc equals to 0 or 1);
T time of the measurement (ccc – value in seconds);
P the **PEAK** value (ccc – the value in dB);
Q the **P_P** value (ccc – the value in dB);
M the **MAX** value (ccc – the value in dB);
R the **RMS** value (ccc – the value in dB);
H the **VDV** value (ccc – the value in dB).

The exemplary results of the instrument's response after sending to it the following sequence of characters: **#2,1;** coming from the first profile are given below:

a) for the case of the **SLM** mode:

#2,1,v2,V0,T39,P125.4,M107.0,N20.6,S81.7,R102.1,U118.0,B(4)112.1,I(480)102.1,Y103.9,Z105.4, L(01)107.9,L(10)107.6,L(20)107.2,L(30)102.8,L(40)99.0,L(50)96.7,L(60)82.5,L(70)54.5,L(80)20.9, L(90)20.4;

b) for the case of the **DOSE METER** mode:

#2,1,v3,V0,T60,P116.0,M113.0,N20.6,S20.9,D14,d6635,A98.2,R98.2,U116.0,u142.8,E0.04,e21.14, I(480)98.2,J71.4,Y103.1,Z102.9,L(01)113.5,L(10)96.1,L(20)82.8,L(30)21.3,L(40)20.8,L(50)20.7, L(60)20.5,L(70)20.4,L(80)20.2,L(90)20.1;

c) and for the case of the **VLM** mode:

#2,1,v0,V0,T1,P93.9,Q99.7,M45.6,R45.6,H85.0;

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

Example: After sending to the instrument the string:

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

the unit sends out the results of measurement coming from the first profile in predefined, described above, order:

#2,1,V0,T39,P125.4,R102.1,L(01)107.9,L(10)107.6,L(20)107.2,L(30)102.8,L(40)99.0,L(50)96.7, L(60)82.5,L(70)54.5,L(80)20.9,L(90)20.4;

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

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

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

#3 function enables one to read out the current measurement results in **1/1 OCTAVE** or **1/3 OCTAVE** mode.

#3 function format is defined as follows:

#3;

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

#3;<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 = 0 means that "overload does not happen",
= 1 means that "overload appeared",
D6 = 0 means that "spectrum is not averaged ",
= 1 means that "spectrum is averaged ",
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•10 (e.g. 34.5 dB is sent as binary number 345).*

A.5. Function #4 – Read-out of the data file from the internal Flash-Disc

#4 function 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,
#4,0,?;	the count of the files,
#4,0,index,count;	the part of the file containing the catalogue,

where:

index - first record,
count - number of records in the catalogue.

#4,1,fname;	the file containing the measurement results,
#4,1,fname,?;	file size,
#4,1,fname,offset,length;	the part of the file containing the measurement results,
#4,1<address,length;	the part of the file containing the measurement results,

where:

fname - name containing not more than eight-characters,
offset - offset from the beginning of the file,
length - number of bytes to read,
address - absolute internal address,

#4,2,fname;	the file containing the logger results,
#4,2,fname,?;	file size,
#4,2,fname,offset,length;	the part of file containing the logger results,

where:

fname - name containing not more than eight-characters
offset - offset from the beginning of the file,
length - number of bytes to read,

#4,3;	the RAM file,
#4,3,?;	size of RAM file,
#4,3,offset,length;	the part of RAM file,

where:

offset - offset from the beginning of the RAM file,
length - number of bytes to read,

Notice: *The "\" character is treated as the file name of the catalogue and must be sent to the instrument.*

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 characters of the file name,
word 4	file type (binary number),
word 5	reserved,
word 6	the least significant word of the file size,
word 7	the most significant word of the file size,
words 8 - 15	reserved.

A.6. Function #5 – Statistical analysis results read-out

#5 function enables one to read out the statistical analysis results.

#5 function format is defined as follows:

#5,p;

where:

p the source of the statistical analysis results, for p = 1, 2 or 3 it is the corresponding profile and for p = 0 - the results obtained during **1/1 OCTAVE** or **1/3 OCTAVE** analysis.

The device responds, sending the current classes of the 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 = 0 means "overload does not happen",
= 1 means "overload appeared",
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 zero.*

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 statistics)

where:

n the number of the transmitted statistics. For p = 1, 2 or 3 only one statistic is transmitted (n = 1). For p = 0 the number of the transmitted statistics 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 statistic.

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's answer is 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 recovers the predefined filter for the **pos TOTAL** value of channel **chn** and answers in the following format: **#6,type,@,chn,pos,name,avd,cal;**

#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,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 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** denote 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,DD,Rhh,Rmm;** where e=1 if AutoStart function is switched ON in SINGLE mode, e=2 if AutoStart function is switched ON in MULTI mode or 0 if it is switched OFF, **hh:mm** gives the time, **DD** gives the day for the current date, **Rhh,Rmm** gives the repetitions time.

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

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

#7,IC;

Reserved.

#7,SC;

Reserved.

#7,DA;

This function deletes all files (result files and setup files). The function returns **#7,DA;** This function is not accepted while the instrument is in the RUN state.

#7,LP;

Reserved.

#7,BP;

Reserved.

#7,ME;

This function returns the size of internal flash memory in format **#7,ME,FlashMB;**

#7,LS,setup_name;

This function loads setup and writes settings into EEPROM. The selected file must exist. The function returns **#7,LS;**

#7,SS;

This function creates setup file based on the current settings. The function returns **#7,SS;**

#7,HO;

This function enables one to calibrate the instrument via the Harvest SPE Modems.

#7,CS;

This function clears current setup.

#7,DF;
#7,DF,file_name;
#7,DF,file_name<address;

This function deletes all result files or deletes file specified by **file_name** or internal flash address.

#7,DS;
#7,DS,file_name;
#7,DS,file_name<address;

This function deletes all setup files or deletes file specified by **file_name** or internal flash address.

#7,US;

This function returns unit subversion.

#7,BS;

This function returns battery state in percentage. If the instrument is powered from the external power, this function return -1 or if it is powered from the USB interface, the function returns -2.

#7,DL;

This function returns day time limits in format **#7,DL,x;**

#7,DL,x;

This function enables (x = 1) or disables (x = 0) day time limits and returns the following sequence of characters: **#7,DL;**

#7,SL;

This function returns all statistical levels in the format **#7,SL,sl1,sl2,sl3,sl4,sl5,sl6,sl7,sl8,sl9,sl10;**

#7,SL,sl_index,sl_level;

This function sets statistical levels where **sl_index** is the statistical index, **sl_level** is the statistical level and it returns the following sequence of characters: **#7,SL;**

#7,MC;

This function returns microphone compensation in the format **#7,MC,x;**

#7,MC,xxx;

This function sets the microphone compensation and returns the following sequence of characters: **#7,MC;** where **xxx** means:

x=0: Off
x=1: FREE FIELD
x=2: DIFFUSE FIELD
x=3: OUTDOOR ENVIRONMENT
x=4: OUTDOOR AIRPORT
x=5: EXTENSION CABLE

#7,LA;

This function returns the current language in the format: **#7,LA,xx;** where **xx** is language codes: **EN** (English), **IT** (Italian), **PL** (Polish), **RU** (Russian), **HU** (Hungarian), **TU** (Turkish), **NL** (Flemish), **FR** (French), **SP** (Spanish), **DE** (German).

#7,PO;

This function powers off the instrument.

#7,BD;

This function returns baud rate in the format **#7,BD,xxx;**

#7,BD,xxx;

This function sets baud rate and returns the following sequence of characters: **#7,BD;** where **xxx** means:

xxx=8: 115200
xxx=7: 57600
xxx=6: 38400
xxx=5: 19200
xxx=4: 9600
xxx=3: 4800
xxx=2: 2400
xxx=1: 1200

#7,TO;

This function returns RS232 time out in the format **#7,TO,xxx;**

#7,TO,xxx;

This function sets RS232 time out in seconds where **xxx** ∈(1 ÷ 60) and returns the following sequence of characters: **#7,TO;**

#7,WS;

This function returns states of warnings if results are not saved in the format **#7,WS,x;**

#7,WS,x;

This function enables (x = 1) or disables (x = 0) the warnings if the results are not saved and it returns the following sequence of characters: **#7,WS;**

#7,RC;

This function returns the transition type for remote communication in the format **#7,RC,xxx;**

#7,RC,xxx;

This function sets the transition type for remote communication and returns the following sequence of characters: **#7,RC;** where **xxx** means:

xxx=0: Off

xxx=1: Continuous

xxx=2: Packet

#7,RP;

This function returns the packet size for remote communication in the format **#7,RP,xxx;**

#7,RP,xxx;

This function sets the packet size for remote communication and returns the following sequence of characters: **#7,RP;** The possible values are as follows: 1024, 512, 256, 128, 64.

#7,WU;

This function returns the vibration unit type in the format **#7,WU,x;**

#7,WU,x;

This function sets the vibration unit type: non-metric (x = 0), or metric (x = 1) and returns the following sequence of characters: **#7,WU;**

#7,RA;

This function returns the ACC reference levels in the format **#7,RA,xxx;**

#7,RA,xxx;

This function sets the ACC reference levels, where **xxx** ∈(1 ÷ 100) and returns the following sequence of characters: **#7,RA;**

#7,RV;

This function returns the VEL reference levels in the format **#7,RV,xxx;**

#7,RV,xxx;

This function sets the VEL reference levels, where **xxx** ∈(1 ÷ 100) and returns the following sequence of characters: **#7,RV;**

#7,RD;

This function returns the DIL reference levels in the format **#7,RD,xxx;**

#7,RD,xxx;

This function sets the DIL reference levels, where **xxx** ∈(1 ÷ 100) and returns the following sequence of characters: **#7,RD;**

#7,MB;

This function returns the tonality maximum band in the format **#7,MB,xxx;**

#7,MB,xxx;

This function sets the tonality maximum band in percentage, where **xxx** ∈(5 ÷ 25) and returns the following sequence of characters: **#7,MB;**

#7,TS;

This function returns the tonality tone seek in the format **#7,TS,xxx;**

#7,TS,xxx;

This function sets the tonality tone seek in dB, where **xxx** ∈(10 ÷ 50) and returns the following sequence of characters: **#7,TS;**

#7,RE;

This function returns the tonality regression in the format **#7,RE,xxx;**

#7,RE,xxx;

This function sets the tonality regression in percentage, where **xxx** ∈(50 ÷ 100) and returns the following sequence of characters: **#7,RE;**

#7,TB;

This function returns the tonality tone band in the format **#7,TB,xxx;**

#7,TB,xxx;

This function sets the tonality tone band in dB, where **xxx** ∈(10 ÷ 60) and returns the following sequence of characters: **#7,TB;**

#7,SM;

This function returns the RT60 smoothing in the format **#7,SM,xxx;**

#7,SM,xxx;

This function sets the RT60 smoothing, where **xxx** ∈(0 ÷ 15) and returns the following sequence of characters: **#7,SM;**

#7,NM;

This function returns the RT60 noise margin in the format **#7,NM,xxx;**

#7,NM,xxx;

This function sets the RT60 noise margin in dB, where **xxx** ∈(0 ÷ 200) and returns the following sequence of characters: **#7,NM;**

#7,AV;

This function returns the RT60 averaging in the format **#7,AV,x;**

#7,AV,x;

This function enables (x = 1) or disables (x = 0) the RT60 averaging and returns the following sequence of characters: **#7,AV;**

#7,AC,1;

This function clears the RT60 averaging and returns the following sequence of characters: **#7,AC;**

#7,RR;

This function returns the real time results mode in the format **#7,RR,xxx;**

#7,RR,xxx;

This function sets the real time results mode: samples (xxx = 0), or logger results (xxx = 1) and returns the following sequence of characters: **#7,RR;**

#7,WF;

This function returns the state of the **USB DISK FREE SPACE** warning. If the USB disk connected to the instrument has less free space than required to save measurement data, the function returns the following sequence of characters **#7,WF,x;**

#7,WF,x;

This function enables (x = 1) or disables (x = 0) the **USB DISK FREE SPACE** warning and returns the following sequence of characters: **#7,WF;**

#7,WM;

This function returns the state of the **MIN FREE SPACE** warning. If the USB disk connected to the instrument has less free space than set in this position, the function returns the following sequence of characters **#7,WM,xxx;**

#7,WM,xxx;

This function sets the value in the **MIN FREE SPACE** position of the **WARNINGS** sub-list (*path: MENU / SETUP / WARNINGS MIN FREE SPACE*), **xxx** ∈(1 ÷ 1024) MB and returns the following sequence of characters: **#7,WM;**

#7,LB;

This function returns the name of last logger in format **#7,LB,logger_name;**

#7,IE;

This function returns the IEPE CURRENT setting in format **#7,IE,x;**

#7,IE,x;

This function sets IEPE CURRENT amperage to 1.5 mA (x = 0) or 4.5 mA (x = 1) and returns the following sequence of characters: **#7,IE;**

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 – Write-in of the data file into the internal Flash-Disc

#9 function enables the user to write-in the data file into the internal Flash-disc memory. The data file formats are given in Appendix B.

#9 function formats are defined as follows:

#4,2,FILE_LENGTH,DATA the setup file

where:

FILE_LENGTH length of the file in bytes,
DATA binary content of the file.

A.10. Control setting codes

The control setting codes used in the **SVAN 957** instrument (the internal software revision 6.04) are given in the table below.

Table A.1. Control setting codes

Group name	Group code	Code description
Unit type	**U**	U957 (read only)
Serial number	**N**	Nxxxx (read only)
LEVEL METER software version	**W**	WLxxx xxx - revision number (read only)
Software version	**WL**	Wyyy yyy - revision number (read only)
Calibration factor	**Q**	Qnnnn nnnn-real number with the value of the calibration factor ∈ (-99.9 ÷ 99.9)
Meter mode	**Z**	Z0 - **VIBRATION METER** Z1 - **SOUND METER**
VoltageInput	**V**	VoltageInput: V0 - off V1 - on
Measurement function	**M**	M1 - **LEVEL METER** M2 - **1/1 OCTAVE analyser** M3 - **1/3 OCTAVE analyser** M4 - **DOSE METER** M6 - **FFT analyser** M8 - **RT60**
Range	**R**	R1 - **LOW** R2 - **HIGH**
Results displayed on the screen	**P**	P1 - **PROFILE 1** (read only) P2 - **PROFILE 2** (read only) P3 - **PROFILE 3** (read only)

Filter type in profile n in **SLM** mode	**F**	F1:n **Z** filter for profile n F2:n **A** filter for profile n F3:n **C** filter for profile n
Filter type in **1/1 OCTAVE**, **1/3 OCTAVE** or **FFT** analysis	**f**	f1 - **Z** filter f2 - **A** filter f3 - **C** filter
Filter type in profile n in **VLM** mode	**I**	I1:n **HP1** filter for profile n I2:n **HP3** filter for profile n I3:n **HP10** filter for profile n I4:n **Vel11** filter for profile n I5:n **Vel3** filter for profile n I6:n **Vel10** filter for profile n I7:n **VelMF** filter for profile n I8:n **Dil1** filter for profile n I9:n **Dil3** filter for profile n I10:n **Dil10** filter for profile n I15:n **KB** filter for profile n I16:n **Wk** filter for profile n I17:n **Wd** filter for profile n I18:n **Wc** filter for profile n I19:n **Wj** filter for profile n I20:n **Wm** filter for profile n I21:n **Wh** filter for profile n I22:n **Wg** filter for profile n I23:n **Wb** filter for profile n
Detector type in profile n in **SLM** mode	**C**	C0:n - **IMPULSE** detector in profile n C1:n - **FAST** detector in profile n C2:n - **SLOW** detector in profile n
Detector type in profile n in **VLM** mode	**E**	E0:n - **100ms** detector in profile n E1:n - **125ms** detector in profile n E2:n - **200ms** detector in profile n E3:n - **500ms** detector in profile n E4:n - **1.0s** detector in profile n E5:n - **2.0s** detector in profile n E6:n - **5.0s** detector in profile n E7:n - **10.0s** detector in profile n
Logger type in profile n in **SLM** mode	**B**	Bx:n - x - sum of the following flags flags: 1 - logger with **PEAK** values in profile n 2 - logger with **MAX** values in profile n 4 - logger with **MIN** values in profile n 8 - logger with **RMS** values in profile n
Storing the results of **1/1 OCTAVE** or **1/3 OCTAVE** analysis in logger's file in **SLM** mode	**b**	b0 - switched off (**[ ]**) b1 - switched on (**[√]**)
Logger type in profile n in **VLM** mode	**G**	Gx:n - x - sum of the following flags flags: 1 - logger with **PEAK** values in profile n 2 - logger with **P–P** values in profile n 4 - logger with **MAX** values in profile n 8 - logger with **RMS** values in profile n
Storing the results of **1/1 OCTAVE** or **1/3 OCTAVE** analysis in logger's file in **VLM** mode	**g**	g0 - switched off (**[ ]**) g1 - switched on (**[√]**)

Logger step	**d**	dnnn nnn number in milliseconds ∈ (**2**, **5**, **10**, **20**, **25**, **50**, **100**, **200**, **500**, **1000**) dnns nn number in seconds ∈ (1 ÷ 60) dnnm nn number in minutes ∈ (1 ÷ 60)
Integration period	**D**	D0 - infinity (measurement finished by pressing the **<STOP>** push-button or remotely - by sending S0 control code) Dnns nn number in seconds Dnnm nn number in minutes Dnnh nn number in hours
Repetition of the measurement cycles (RepCycle)	**K**	K0 - infinity (measurement finished by pressing the **<STOP>** push-button or remotely - by sending S0 control code) ..... Knnnn - nnnn number of repetitions ∈ (1 ÷ 1000)
Detector type in the **LEQ** function	**L**	L0 - **LINEAR** L1 - **EXPONENTIAL**
FFT analysis band	**r**	r1 - **FFT** analysis band = **22.4 kHz** r2 - **FFT** analysis band = **11.2 kHz** r3 - **FFT** analysis band = **5.6 kHz** r4 - **FFT** analysis band = **2.8 kHz** r5 - **FFT** analysis band = **1.4 kHz** r6 - **FFT** analysis band = **700 Hz** r7 - **FFT** analysis band = **350 Hz** r8 - **FFT** analysis band = **175 Hz** r9 - **FFT** analysis band = **87.5 Hz**
Window in **FFT** analysis	**w**	w0 - **HANNING** w1 - **RECTANGLE** w2 - **FLAT TOP** w3 - **KAISER BESSEL**
Averaging in **FFT** analysis	**a**	a0 - **LINEAR** a1 - **EXPONENTIAL**
Measure Triggering mode (TriggerMode)	**m**	m0 - switched off (**OFF**) m1 - **SLOPE +** m2 - **SLOPE –** m3 - **LEVEL +** m4 - **LEVEL –** m5 - **GRAD+**
Source of the measure triggering signal for measurement functions: M1, M6, M7 (TriggerSource)	**s**	s0 - **RMS** s1 - **EXT. IO**
Source of the measure triggering signal for measurement function M2 (TriggerOctSource)	**o**	o0 - **SPL(1**) (**SPL** from the first profile) onn - nn number of the filter in **1/1 OCTAVE** spectra ∈ (8 ÷ NOct); Noct = 15 - number of filters in **1/1 OCTAVE** analysis. There are respectively: 8 - 125 Hz 9 - 250 Hz ... 15 - 16 kHz

Source of the measure triggering signal for measurement function M3 (TriggerTerSource)	**t**	t0 - **SPL(1)** (**SPL** from the first profile) tnn - nn number of the filter in **1/3 OCTAVE** spectra ∈ (23 ÷ NTer), NTer=45 - number of filters in **1/3 OCTAVE** analysis. There are respectively: 23 - 125 Hz 24 - 160 Hz ... 45 - 20 kHz
Measure Triggering level (TriggerLev) in **SLM** mode	**l**	lnnn - nnn level in dB ∈ (24 ÷ 136)
Measure Triggering level (TriggerLev) in **VLM** mode	**n**	nxxx - xxx level in dB ∈ (60 ÷ 200)
Number of records taken into account before the fulfilment of the triggering condition (TriggerPre)	**p**	pnn - nn number of records saved in the logger before the triggering condition; nn ∈ (0 ÷ 50)
Number of records taken into account after the fulfilment of the triggering condition (TriggerPost)	**q**	qnnn - nnn number of records saved in the logger after the fulfilment of the triggering condition; nn ∈ (0 ÷ 200)
Measure Triggering gradient in **SLM** mode	**O**	Onnn - nnn gradient in dB/ms ∈ (1 ÷ 100)
Measure Triggering gradient in **VLM** mode	**k**	knnn - nnn gradient in dB/ms ∈ (1 ÷ 100)
Spectrum Band	**A**	A0 - **FULL** A1 - **AUDIO**
Exposure Time	**e**	ennn - nnn time in minutes ∈ (1 ÷ 480)
Criterion Level	**c**	c1 - 80 dB c2 - 84 dB c3 - 85 dB c4 - 90 dB
Threshold Level	**h**	h0 - None h1 - 75 dB h2 - 80 dB h3 - 85 dB h4 - 90 dB
Exchange Rate	**x**	x2 - 2 dB x3 - 3 dB x4 - 4 dB x5 - 5 dB
FFT lines	**y**	y0 - 1920 y1 - 960 y2 - 480
FFT logger	**z**	z0 - switched off (**[ ]**) z1 - switched on (**[√]**)
Logger	**T**	T0 - switched off (**[ ]**) T1 - switched on (**[√]**)
Delay in the start of measurement	**Y**	Ynn nn delay given in seconds ∈ (0 ÷ 59)
State of the instrument (Stop or Start)	**S**	S0 - **STOP** S1 - **START**

Extended IO Mode	**Xx**	Xx0 - **ANALOG OUT** Xx1 - **DIGITAL IN** Xx2 - **DIGITAL OUT**
Extended IO Function	**Xz**	Xz0 - **TRIGGER PULSE** Xz1 - **ALARM PULSE**
Extended IO Active Level	**Xc**	Xc0 - **LOW** Xc1 - **HIGH**
Extended IO Source	**Xs**	Xs3 - **PEAK(1)** Xs4 - **SPL(1)** Xs5 - **LEQ(1)**
Extended IO Alarm Level	**Xn**	Xnxxxx - xxxx alarm level in dB multiple by 10 $\in$ (300 ÷ 1400)
Reference Level ACC	**Xa**	Xannn - nnn reference level $\in$ (1 ÷ 100) in $\mu m/s^2$
Reference Level VEL	**Xv**	Xvnnn - nnn reference level $\in$ (1 ÷ 100) in nm/s
Reference Level DIL	**Xd**	Xdnnn - nnn reference level $\in$ (1 ÷ 100) in pm
Auto Save	**XA**	XA0 - switched off (**[ ]**) XA1 - switched on (**[√]**)
RAM File	**XR**	XR0 - switched off (**[ ]**) XR1 - switched on (**[√]**)
Save Statistics	**XS**	XS0 - switched off (**[ ]**) XS1 - switched on (**[√]**)
Save Max Spectrum	**XM**	XM0 - switched off (**[ ]**) XM1 - switched on (**[√]**)
Save Min Spectrum	**Xm**	Xm0 - switched off (**[ ]**) Xm1 - switched on (**[√]**)
Replace File	**XP**	XP0 - switched off (**[ ]**) XP1 - switched on (**[√]**)
Direct Save	**XD**	XD0 - switched off (**[ ]**) XD1 - switched on (**[√]**)
Logger Triggering mode (TriggerMode)	**XT**	XT0 - switched off (**OFF**) XT1 - **LEVEL +** XT2 - **LEVEL –**
Logger Triggering level (TriggerLev) in **SLM** mode	**XL**	XLnnn - nnn level in dB $\in$ (24 ÷ 136)
Logger Triggering Number of records taken into account before the fulfilment of the triggering condition (TriggerPre)	**XQ**	XQnn - nn number of records saved in the logger before the triggering condition; nn $\in$ (0 ÷ 50)
Logger Triggering Number of records taken into account after the fulfilment of the triggering condition (TriggerPost)	**Xq**	Xqnnn - nnn number of records saved in the logger after the fulfilment of the triggering condition; nn $\in$ (0 ÷ 200)