

APPENDIX A - REMOTE CONTROL

Interface RS 232 comply with CCIT V.24 standard, except connector type (in the unit the LEMO socket type FGG.0B.305 is used). Practically all existing Personal Computers can be linked with the instrument by means of this interface using the cable supplied with the unit.

The RS232 functions include:

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

Maximum transmission speed is 38400 bits/s.



Notice: For reliable operation of the RS 232, proper synchronisation of the transmission by **DSR** and **DTR** lines (according to their definitions) is required. Setting the two „stop bits” for the PC RS232 controller is also recommended.

Programming of the RS 232 interface operation requires:

1. sending "the function code",
 2. sending proper data file
- or
3. receiving data file.



Notice: The presented below text is valid for the internal software versions started from the number 2.02.

INPUT/OUTPUT transmission types

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 **METER MODE**,
- #3 output of the measurement data in the **ANALYZER MODE**,
- #4 output (read out) of the data file from the internal "RAM-disk",
- #5 input (write to) of the data file to the internal "RAM-disk",
- #6 control settings for the SV 06A / SV 08A modules.

Function #1 - input/output of the control setting codes

Function #1 enables one to send the control setting codes to the instrument and read out a file of the current control state. The list of the control setting codes is given in table A.1, A.2 and A.3.

#1 function format is defined as follows:

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

where:

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

or

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

where:

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

X? - request to send the current X code setting

The instrument will output control settings file in the format:

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

for the all **X?** group codes

In order to read out all current control settings one has to send to the device: **#1;**

The instrument will output control settings file in the format: **#1,X ccc,X ccc, (...) ,X ccc;**



Notice: All bytes of that transmission are ASCII characters.

Function #2 - read out of the measurement data in the METER MODE

Function #2 enables one to read out the current measurement data in the **METER MODE**.

In order to read out the measurement results one has to send to the instrument the following code:

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

where:

X - code of the result.

As an answer the instrument will send the values of the results in the format defined as follows:

#2,Xccc,Xccc,Xccc,(...),Xccc;

or (when the results are absent or not available)

#2,?;

The codes of the results are defined as follows:

- T** time of the measurement (ccc – value in seconds);
- V** Overload flag (ccc equals to 0 or 1);
- C** the value of Crest Factor (ccc – the value in dB);
- P** Peak value (ccc – the value in dB);
- M** Max value (ccc – the value in dB);
- N** Min value (ccc – the value in dB);
- L** the main RMS result e.g. Leq, Val etc. (ccc – the value in dB).



Notice: The set of the results transmitted to a PC with function #2 is taken from the **currently active profile** (i.e. is determined by the setting code p).

Function #3 - read out of the measurement data in the ANALYZER MODE

Function #3 enables one to read out the current measurement data in the **ANALYZER MODE**. The transmitted data can be "Time" signal, FFT spectrum, 1/1 octave or 1/3 octave spectrum. Spectra can be instantaneous or averaged depending on the **AVERAG**. (Averaging) control window setting.

#3 function format is defined as follows:

#3;

The device will respond sending last measured spectrum (when in STOP state) or currently measured spectrum (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 contains the data about the current state of the instrument.

D	D	D	D	D	D	D	D
7	6	5	4	3	2	1	0

where:

- D7 = 1 - denotes "overload indicator",
- D6 = 1 - denotes "averaged spectrum",
- D5 = 0 - instantaneous result (RUN State);
= 1 - final result (STOP State)
- D4 = 0 - bits D0 to D3 have the meaning below given,
= 1 - D0 to D3 are reserved bits,
- D3 = 1 - denotes 1/3 octave spectrum,
- D2 = 1 - denotes 1/1 octave spectrum,
- D1 = 1 - denotes FFT spectrum,
- D0 = 1 - denotes time record.

Function #4 - output (read out) of the data file from internal "RAM-disk"

Function #4 enables one to read out the data file from the internal "RAM-disk". Data file formats are given in Appendix B.

#4 function format is defined as follows:

#4,FILE TYPE,FILE NAME[, OFFSET[,LENGTH]];

where:

FILE TYPE - file type: 0 - catalogue file,
1 - file containing **METER MODE** results,
2 - file containing **ANALYZER MODE** results,
3 - set-up file,

FILE NAME is up to eight-character name.

OFFSET (optional) - file word number, from which the data will be transferred (default value = 0).

LENGTH (optional) - number of words to be transferred (default value = file length).

When **OFFSET+LENGTH** is greater than the file length, **LENGTH** parameter is ignored and data are transferred until the end of file. All bytes are sent as the ASCII characters.

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

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

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

When an error is detected in the file specification or data, the instrument will send:

#4,?;

Read out of the catalogue of the files is possible after sending:

#4,0,\;



Notice: Character "\ is obligatory catalogue file name.

The Catalogue File is a set of 16 words (each word has 16 bits) records. Each record describes one file saved in the instrument "RAM-disk". 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,
words 8 - 15 reserved.



Notice: Not all records of the catalogue must contain the data about the existing files. The value zero placed in the first record byte denotes that the record is empty.

Function #5 - input (write to) of the data file to the internal "RAM-disk"

Function #5 enables one to write the data file to the internal "RAM-disk". Data file formats are given in Appendix B.

#5 function format is defined as follows:

#5,FILE TYPE,FILE NAME;<4 bytes containing the file size (in binary form)> <data byte> (...)
<data byte>

where:

FILE TYPE - file type: 1 - file containing **METER MODE** results,
 2 - file containing **ANALYZER MODE** results,
 3 - set-up file.

FILE NAME is up to eight character file name.

All bytes of the file name (to the semi-colon) must be sent as ASCII characters. All data words are sent as **<LSB>,<MSB>**. When an error is detected in file specification or data, the instrument will send:

#5,?;

After successful data storing in the instrument's "RAM-disk" the unit returns sequence:

#5,!;

In the case when the **file** of the given type and name **already exists** it **is erased** without any warning and **is replaced** by the new one. Such operation is treated as valid and after finishing it, this is confirmed by the message:

#5,!;

With **#5 function** the user is able to erase the files in the instrument. It is enough for this purpose to send the request to write down the file with the length equal to 0 e.g.:

#5,FILE TYPE,FILE NAME;<0><0><0><0>

This operation is also confirmed by the message:

#5,!;

Function #6 – control settings of the SV 06A and SV 08A modules

Function #6 enables one to send the control setting codes to the SV 06A or SV 08A modules and read out a file of the current control state. The list of the control setting codes is given in Tab. A.4.

#6 function format is defined as follows:

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

where:

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

or

#6,X ccc,X?,X ccc, (...) ,X?,X ccc;

where:

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

X? - request to send the current X code setting

The instrument will output control settings file in the format:

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

for all **X?** group codes.

In order to read out **all** current control settings one has to send to the device:

#6;

The instrument will output control settings file in the format:

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

All bytes of that transmission are ASCII characters.

Table A.1. General control setting codes

Group name	Group code	Code description
Serial number	NE	Nexxxx (read only)
Sound BEEP	P	P1 - On P2 - Off
CALIBRATION	Q	Q1 - On Q2 - Off
State of measurements START/STOP	S	S1 - START S2 - STOP
Microphone's polarisation MIC. POL.	V	V1 - 0 V V2 - 200 V
Internal software version number	W	Wxxxxx xxxxx – coded version number
Instrument's MODE	X	X0 - other (read only) X1 - METER X2 - ANALYZER <i>Notice: X1 or X2 code will also cause the entering of STOP State</i>

Table A.2. Control setting codes in ANALYZER MODE

Group name	Group code	Code description
TRIGGER	A	A1 - Free Run A2 - Internal "+" A3 - Internal "-" A4 - External
TRIGGER LEVEL	B	B-999 -99.9% full scale B-998 -99.8% full scale (...) B998 +99.8% full scale B999 +99.9% full scale
AVERAGING	C	C1 - Fast HM (Hold Max) C2 - Fast Lin (Linear) C3 - Off C4 - Linear C5 - Exponent (Exponential) C6 - Hld Max (Hold Max)
RMS_DET. (RMS detector type)	xC	xC1 - Linear xC2 - Impulse xC3 - Fast xC4 - Slow
AVERAGING No. (Averaging number)	D	Time or Spectrum: D2 - 2 D3 - 3 (...) D2047 - 2047 D2048 - 2048
AV.TIME (Averaging time)		1/1 Octave or 1/3 Octave: D1 - 1 s D2 - 2 s (...) D3599 - 3599 s D3600 - 3600 s

Table A.2. - continuation

Group name	Group code	Code description
ΔINTEGR. (Integration step for 1/1 or 1/3 octave function)	E	E1 - 1/2 s E2 - 1/4 s E3 - 1/8 s E4 - 1/16 s E5 - 1/32 s E6 - 1/64 s E7 - 1/128 s
FILTER (Weighting filter)	F	F1 - Lin F2 - A F3 - C F4 - HP
INPUT	G	G1 - Reference G2 - Microphone G3 - Direct G4 - Charge G5 - Accelerometer G6 - SV 06 or SV 08 module
BAND and ZOOM BAND	H	H1 - 1.38 Hz (Zoom Band) H2 - 2.76 Hz (Zoom Band) H3 - 5.52 Hz (Zoom Band) H4 - 11.0 Hz (Zoom Band) H5 - 22.1 Hz (Zoom Band) H6 - 44.2 Hz (Zoom Band) H7 - 88.4 Hz (Zoom Band) H8 - 177 Hz (Zoom Band) H9 - 354 Hz (Zoom Band) H10 - 707 Hz (Zoom Band) H11 - 1.41 kHz (Zoom Band) H12 - 2.83 kHz (Zoom Band) H13 - 5.66 kHz (Zoom Band) H14 - 11.3 kHz H15 - 22.6 kHz H16 - 45.3 kHz
WINDOW (for FFT)	I	I1 - User I2 - Hanning I3 - Rectangle I4 - Flat Top I5 - Kaiser-Bessel
A.REPEAT (Auto repeat of measurement)	K	K1 - On K2 - Off
S_LINES (Spectrum lines number)	L	L1 - 120 spectrum lines L2 - 240 spectrum lines L3 - 480 spectrum lines L4 - 960 spectrum lines L5 - 1920 spectrum lines
FUNCTION	M	M1 - Time M2 - Spectrum M3 - 1/1 Octave M4 - 1/3 Octave
RANGE	R	R1 - 70 dB (110 dB for vibration) R2 - 90 dB (130 dB for vibration) R3 - 110 dB (150 dB for vibration) R4 - 130 dB (170 dB for vibration)

Table A.2. - continuation

Group name	Group code	Code description
TRIGGER DELAY	T	T-4095 -4095 samples T-4094 -4094 samples (...) T4095 4095 samples T4096 4096 samples
Centre frequency for Zoom C.FREQ. (n_i – spectrum line number for given frequency band) the usage is not recommended (this setting will be changed in the future)	Y	Y2/ n_2 - band 2.76 Hz (write only) Y3/ n_3 - band 5.52 Hz (write only) (...) Y13/ n_{13} – band 5.66 kHz (write only) Y14/ n_{14} – band 11.3 kHz (write only)
ZOOM	Z	Z1 - On (L1 code is also executed) Z2 - Off

Table A.3. Control setting codes in METER MODE

Group name	Group code	Code description
AVERAG. (RMS detector type)	c	c1 - Linear c2 - Impulse c3 - Fast c4 - Slow
INT.TIME (Total integration time)	d	d1 - 1 second (...) d59 - 59 seconds d1m - 1 minute (...) d59m - 59 minutes d1h - 1 hour (...) d16h - 16 hours
Δ INT. (Short integration time)	e	e1 - reserved e2 - reserved e3 - reserved e4 - 0.01 s e5 - 0.02 s e6 - 0.05 s e7 - 0.1 s e8 - 0.2 s e9 - 0.5 s e10 - 1 s
FILTER (Weighting filter)	f	f1 - Lin f2 - A f3 - C f4 - not active f5 - G f6 - HP f7 - W-Bxy f8 - W-Bz f9 - H-A f10 - W-Bc f11 - not active

Table A.3. - continuation

Group name	Group code	Code description
FILTER (Weighting filter)	f	f12 - KB f13 - not active f14 - not active f15 - MF-Vel f16 - Vel1 f17 - Vel3 f18 - Vel10 f19 - Dil1 f20 - Dil3 f21 - Dil10
INPUT	g	g1 - Reference g2 - Microphone g3 - Direct g4 - Charge g5 - Accelerometer g6 - SV 06 or SV 08 module
A.REPEAT (Auto-repeat of measurement)	k	k1 - On k2 - Off
FUNCTION	m	m1 - Ref (Reference) m3 - Leq (Microphone) m4 - Spl (Microphone) m5 - Ssa (Microphone) m6 - Dsl (Direct) m7 - Dsa (Direct) m8 - Val (Charge or Acceler.)
Active PROFILE (valid only for the Microphone input)	p	pn – where n is the number from 1 to 5
RANGE	r	r1 - 70 dB (110 dB for vibration) r2 - 90 dB (130 dB for vibration) r3 - 110 dB (150 dB for vibration) r4 - 130 dB (170 dB for vibration)
A.RANGE	u	u1 On u2 Off



Notice: For all inputs (except SV06 / SV08) the parameters: **c** – **RMS detector type**, and **f** – **weighting filter** are allied with the selected profile (setting p). **Each profile has its own c and f parameters!**

Table A.4. Control setting codes for the SV 06A and SV 08A modules

Group name	Group code	Code description
Active channel	C	Cn - n is the number of the active channel (from 1 to 4)
Weighting filter of the active channel	F	F1 - Lin F2 - A F3 - C F4 - not active F5 - not active F6 - HP F7 - W-Bxy F8 - W-Bz F9 - H-A F10 - W-Bc F11 - not active F12 - KB F13 - not active F14 - not active F15 - MF-Vel F16 - Vel1 F17 - Vel3 F18 - Vel10 F19 - Dil1 F20 - Dil3 F21 - Dil10
"k" coefficient of the active channel (for vector calculations)	K	K1 - k=0.01 K2 - k=0.02 (...) K199 - k=1.99 K200 - k=2.00
Analogue low-pass filter of the active channel (only for SV 06A module)	L	L1 - On L2 - Off
RANGE of the active channel	R	R1 - 110 dB (70 dB for Microphone) R2 - 130 dB (90 dB for Microphone) R3 - 150 dB (110 dB for Microphone) R4 - 170 dB (130 dB for Microphone)
AES / EBU Source	S	S1 - SV 06A S2 - SV 08A
Type of the input of the active channel	T	T0 - Accelerometer T1 - Charge (SV 06A) T1 - Microphone (SV 08A)
Active vector	V	V0 - Off V1 - On

Table A.5. Auxiliary control setting codes

Group name	Group code	Code description
File operations in METER MODE Warning: These codes will only set proper window parameter without any associated file operation!	xf	xf1 - Auto Save (write only) xf2 - Save Next (write only) xf3 - Save (write only)