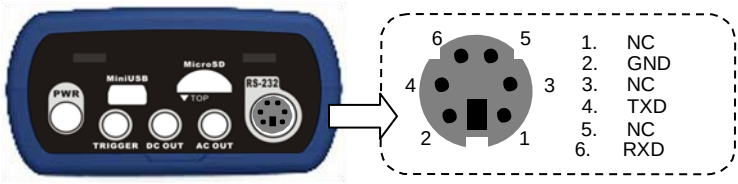
5 RS-232 Communication Protocol

The Sound Level Meter **SW 1000/SW 2000** has an RS-232 serial interface. User can modify the configuration of the sound level meter via a serial interface and control the sound level meter to run and to stop, and get the current measurement parameters and results for further processing. Operation via serial interface does not affect keyboard operation.

5.1 Hardware Configuration and Settings of Interface

SW 1000/SW 2000 uses three-wire serial interface, the physical socket is PS/2-6 pin.

Below is the definition of RS-232 interface:



RS-232 transfer settings:

Transfer Mode	Full-duplex
Synchronous / Asynchronous Mode	Asynchronous transfer
Baudrate	4800 bps, 9600 bps, 19200 bps
Data Bits	8 bit
Stop Bits	1 bit
Parity	None
Flow Control	Follow the time data in the rated parameters table

5.2 Transfer Protocol

SW 1000/SW 2000 RS-232 interface protocol is based on a block transfer, as shown below:

A typical command block or response block consists of “starting character, ID, attribute character, command or data, end character, block check character, carriage returns, line feeds”, as shown below:

<STX>	ID	ATTR	Command or Data	<ETX>	BCC	<CR>	<LF>

5.2.1 Start/Stop of the Block Transfer

A command block or response block contains start characters, end characters and other control character as shown below:

Name	Hex	Meaning
<STX>	02H	Start Character
<ETX>	03H	Stop Character
<CR>	0DH	Carriage Returns
<LF>	0AH	Line Feeds

5.2.2 Device ID

Each command block contains an ID. It is used to distinguish among a network of more than one sound level meter. When the sound level meter receives a command block, it will match the ID contained in the command block and its own ID. If matched, the corresponding operation will be performed. If not, then ignore this command. The response block returned from the sound level meter also contains the ID which is used to indicate that the block is sent by which one.

☆**Note:** Please ensure that the ID of sound level meter in the same network are different from each other, otherwise the error will occur during operation!

ID is one byte of binary. It ranges from 1~255.The corresponding hex value is 01H~FFH.

It means that the command is a broadcast command if the ID contained in command block is 00H. The sound level meter will execute the instruction without any return data, regardless of its own ID when the command is a broadcast command.

Name	Hex	Meaning
ID	01H~FFH	Device ID
	00H	Broadcast Command

5.2.3 ATTR Attribute Character

ATTR attribute characters indicate the type of command or response.

Name	Hex	Meaning
'C'	43H	Command Block
'A'	41H	Response Block
<ACK>	06H	Normal Response
<NAK>	15H	Error Response

5.2.4 BCC (Block Check Character)

BCC check bit which include in block is calculated by the sender. The receiver can calculate the block's BCC value and will compare with the BCC value contained in the send block. If same, it indicates that the received block is correct. BCC value is calculated by using bytes between <STX> and <ETX> with XOR operation. Sound level meter will not verify operation and directly authorized instruction if BCC is 00H.This way you can simplify the sending of the instruction block, but do not recommend this way for long-distance applications, because the BCC is the only way to guarantee reliability of data transmission.

Name	Hex	Meaning
BCC	01H~FFH	XOR Checksum
	00H	Ignore the Checksum

5.2.5 Block Transfer Format

Block transfer of data have four types: command block, response block, normal response block and error response block. The following were to describe the four types of instruction format.

(1) Command Block: sent by the computer.

<STX>	ID	ATTR	Instruction	Parameter	<ETX>	BCC	<CR>	<LF>
1	1	1	3	N	1	1	1	1 Byte

Where: ATTR='C'.

All instructions occupy 3 bytes. If more than one parameter included, all parameters should be separated by spaces.

(2) Response Block: sent by the sound level meter.

<STX>	ID	ATTR	Response	<ETX>	BCC	<CR>	<LF>
1	1	1	N	1	1	1	1 Byte

Where: ATTR='A'.

If more than one response data, each data should be separated by a comma ',',

(3) Normal Response: sent by the sound level meter.

<STX>	ID	ATTR	<ETX>	BCC	<CR>	<LF>
1	1	1	1	1	1	1 Byte

Where: ATTR=<ACK>。

(4) Error Response: sent by the sound level meter

<STX>	ID	ATTR	Error code	<ETX>	BCC	<CR>	<LF>
1	1	1	4	1	1	1	1 Byte

Where: ATTR=<NAK>.

The error code occupies 4 bytes. All possible error code is listed in the following table. The meaning of error code is described in section 5.2.6.

Error Code	Meaning
0001H	Instruction Error
0002H	Parameter Error
0003H	Unavailable on the Current State

5.2.6 Recovery from Transmission Errors

Various errors may occur when transfer the command block or response block. The following describe how the sound level meter will deal with and restore to the initial state when an error occurs.

(1) Block Transfer Not Complete

Section 5.2.5 describes the 4 kinds of block transmission format. When the sound level meter receives the beginning of a block of characters <STX>, it will continue to receive the remaining data until the end of the block <CR>, <LF>. When the data reception is complete and correct parity, the sound level meter will conduct follow-up actions. If received the character <STX> again before <CR>, <LF>, the sound level meter will ignore all the information previously received and re-start the reception of a block.

(2) Validation Failure

After receiving the data block, sound level meter will verify it (except when BCC=00H). When validation fails, the sound level meter will ignore this instruction.

(3) Instruction Error

The sound level meter may not recognize the instruction received due to the computer sends an undefined instruction, or unexpected error has occurred during transmission. When the above errors occur, the sound level meter will return a NAK block, which contains the error code 0001H.

(4) Parameter Error

Parameters include in command block also could be wrong due to the parameters not separate by a space, over the available range, or an incorrect number of arguments. When the above error occurs, the sound level meter will return NAK block, which contains the error-code 0002H.

(5) Unavailable on the Current State

The current state cannot make the appropriate operating when the following happens:

1	Be request to return octave data in level meter mode, or be request to return level meter data in octave mode.
2	Be request to perform the calibration operation when running the measurement.
3	Be request to change the measurement parameters or system parameters when running the measurement.

When the above error occurs, the sound level meter will return NAK block, which contains the error-code 0003H.

5.2.7 Flow Control

The sound level meter uses three-wire serial interface by P/S2-6 pin socket, which doesn't contain the hardware flow control pins. Sound level meter doesn't support software flow control. Operation along to the requirements of the rated section 5.2.9 Rated Parameters can guarantee the correctness of the send data and receive data.

5.2.8 Multi-Machine Operation

More than one sound level meter can be connected to the RS-232 bus, to form a measurement network. Users can change the setting of all sound level meter in same network through broadcast instruction, or access to data and parameters of an each sound level meter by ordinary instruction.

Need to pay attention:

(1) Ensure that no same ID of sound level meter in each network.

(2) User cannot broadcast command which can return any data.

5.2.9 Rated Parameters

Name	Min.	Rated	Max.	Description
Response time of sound level meter	—	—	2s	Time-out processing should be operating when the value exceeds.
Time interval of instruction sending to sound level meter	—	100ms	—	—
Waiting time after received <STX> for sound level meter	—	Unlimited	—	Means that the sound level meter will waiting for the remaining data forever.
Time interval between each byte for sound level meter to receive	—	Unlimited	—	Means that the sending speed of the computer could be very slow.

5.3 Instruction

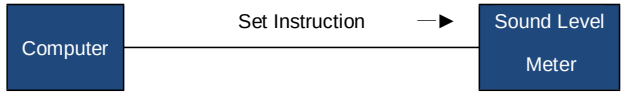
The instruction has two types: set instructions and query instructions.

Set Instructions: Set the measurement parameters and system parameters of sound level meter.

Query Instructions: Query the parameters and data of the sound level meter.

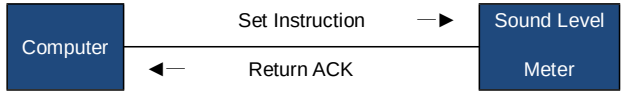
There are 3 kind of situation for sending instruction to sound level meter: set instruction (no response), set instructions (with response), query instructions.

(1) Set Instruction (no response):

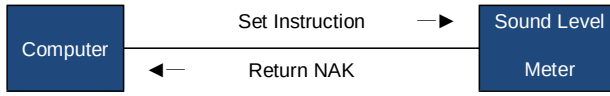


(2) Set instructions (with response):

Normal response:

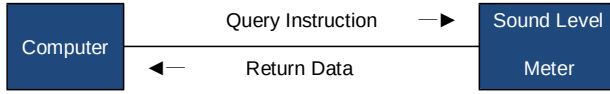


Error response:

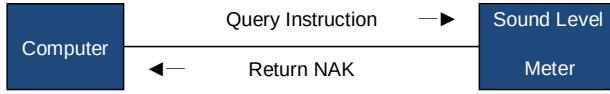


(3) Query command:

Normal response:



Error response:



5.3.1 Instruction List

5.3.2 Instruction Format

In this section, "□□□" on behalf of the 3 characters of the instruction, "p1, p2 ....." on behalf of the parameter "d1, d2 ..." means the data, "_" means a space.

(1) Separate The Parameters By Space For Multiple Parameters In One Instruction:

□□□ Instruction without parameters

□□□p1 Instruction with 1 parameter

□□□p1_p2 Instruction with 2 parameters

□□□? Instruction with query parameter

□□□p1_? Instruction with 1 parameter and a query parameter

□□□p1_ p2_? Instruction with 2 parameters and a query parameter

The parameters can be a wide range, for example from 1 to 255. These parameters are sending by the format of ASCII. Therefore, you may need to send 1~3 bytes.

□□□93 Parameter is 93

□□□124 Parameter is 124

Note that both of 93 and 124 are single parameter. So the individual numbers don't need to be separated by spaces.

□□□1_64 2 individual parameters, 1 and 64

Note that 1 and 64 are two parameters in one instruction. So those parameters need to be separated by space.

The parameter is possible to be decimal or integer type. However, if the actual value is integer type, decimal point and decimal bits can be omitted.

(2) Separate The Data By Comma For Multiple Data In One Response

d1,d2,d3 Return 3 data

Response block, the data bits actually returned is less than its maximum possible number of digits, leading zeros. For example, return 2 data with the maximum possible value 255 (3 digits), and the actually data is 76 and 9, the response is:

076,009 Return data 76 and 9

If the returned data contains date and time, use the slash "/" to separate data and use the colon ":" to separate the time:

2011/08/05，12:13:55

5.3.3 Instruction Describe

Note in This Section:

- In the following description, the value, range and default value of parameter are show as ASCII code.
  - The default value means the sound level meter just delivery to user or restore to the factory settings.

IDXp1: Setup ID

ID of sound level meters in one network must be different. Otherwise, there will be a communication error.

☆**Note:** When the IDX instruction is correctly received by sound level meter, ACK signal will be returned with the new ID.

	Instruction			**Parameters**
Explanation	IDX			p1: ID number; Range: 1~255; Default: 1
ASCII	I	D	X	1
Hex	49H	44H	58H	31H
Byte	1	1	1	1~3
Return	ACK / NAK			

Example 1: set the ID as 3.

02 01 43 **49 44 58 33** 03 25 0D 0A

Return: ACK. Note where ID has been changed to 3 (03H).

02 03 06 03 040D 0A

Example 2: set the ID as 255.

02 01 43 **49 44 58 32 35 35** 03 24 0D 0A

Return: ACK. Note where ID has been changed to 255 (FFH).

02 FF 06 03 F8 0D 0A

IDX?: Query ID

	Instruction			Parameters
Explanation	IDX			Query parameter: ?
ASCII	I	D	X	?
Hex	49H	44H	58H	3FH
Byte	1	1	1	1
Return	Return the current ID number			

Example: query ID.

02 01 43 **49 44 58 3F** 03 29 0D 0A

Return: the current ID 001.

02 01 41 **30 30 31** 03 70 0D 0A

BRTp1: Set the RS-232 Baud Rate

☆**Note:** When the BRT instruction is correctly received by the sound level meter, it will return the ACK by previous baud rate, and then update the baud rate.

	Instruction			Parameters
Explanation	BRT			p1: RS-232 baud rate; 2=4800bps; 3=9600bps; 4=19200bps; Default: 3
ASCII	B	R	T	3
Hex	42H	52H	54H	33H
Byte	1	1	1	1
Return	ACK / NAK			

Example: set the baud rate to 9600bps.

02 01 43 **42 52 54 33** 03 34 0D 0A

Return: ACK.

02 01 06 03 06 0D 0A

BRT?: Query The RS-232 Baud Rate Setting

	Instruction			Parameters
Explanation	BRT			Query parameter: ?
ASCII	B	R	T	?
Hex	42H	52H	54H	3FH
Byte	1	1	1	1
Return	Return the current baud rate			

Example: query the current baud rate.

02 01 43 **42 52 54 3F** 03 38 0D 0A

Return: the current baud rate is 9600bps.

02 01 41 **33** 03 72 0D 0A

XONp1: Set the Flow Control

	Instruction			Parameters
Explanation	XON			p1: Flow control mode; 0=Hardware flow control; 1=Software flow control; Default: 1
ASCII	X	O	N	1
Hex	58H	4FH	4EH	31H
Byte	1	1	1	1
Return	ACK / NAK			

Example: set to software flow control mode.

02 01 43 **58 4F 4E 31** 03 2B 0D 0A

Return: ACK.

02 01 06 03 06 0D 0A

XON?: Query Flow Control Setting

	Instruction			Parameters
Explanation	XON			Query parameter: ?
ASCII	X	O	N	?
Hex	58H	4FH	4EH	3FH
Byte	1	1	1	1
Return	Return flow control mode			

Example: query flow control mode.

02 01 43 **58 4F 4E 3F** 03 25 0D 0A

Return: the current flow control mode is software flow control.

02 01 41 **31** 03 70 0D 0A

RETp1: Set Response Mode

Response is the ACK / NAK signal returned from the sound level meter (HIS and OCS instruction returns MicroSD card state or NAK).User can enable or disable such a response.

☆**Note:** RET instruction itself is not affected by response mode. When the sound level meter receive the RET instruction, it will return ACK/NAK whether the current state is enabled or disabled. Query command is not subject to the influence of response mode.

	Instruction			Parameters
Explanation	RET			p1: Response mode; 0=Disabled; 1=Enabled; Default: 1
ASCII	R	E	T	1
Hex	52H	45H	54H	31H
Byte	1	1	1	1
Return	ACK / NAK			

Example: set to enable response.

02 01 43 **52 45 54 31** 03 31 0D 0A

Return: ACK.

02 01 06 03 06 0D 0A

RET?: Query Response Mode Setting

	Instruction			Parameters
Explanation	RET			Query parameter: ?
ASCII	R	E	T	?
Hex	52H	45H	54H	3FH
Byte	1	1	1	1
Return	Return response mode			

Example: query response mode.

02 01 43 **52 45 54 3F** 03 3F 0D 0A

Return: the current response mode is to enable the response.

02 01 41 **31** 03 70 0D 0A

MEMp1: Set the Measurement Mode

When MEM instruction is correctly received by the sound level meter, it will switch to the main screen of the octave mode or the main screen of level meter mode according to the corresponding parameter in instruction.

	Instruction			Parameters
Explanation	MEM			p1: Measurement mode; 0=Octave; 1=Level meter mode; Default: 1
ASCII	M	E	M	1
Hex	4DH	45H	4DH	31H
Byte	1	1	1	1
Return	ACK / NAK			

Example: set the sound level meter mode.

02 01 43 **4D 45 4D 31** 03 37 0D 0A

Return: ACK.

02 01 06 03 06 0D 0A

MEM?: Query Measurement Mode Setting

	Instruction			Parameters
Explanation	MEM			Query parameter: ?
ASCII	M	E	M	?
Hex	4DH	45H	4DH	3FH
Byte	1	1	1	1
Return	Return the measurement mode			

Example: query the measurement mode.

02 01 43 **4D 45 4D 3F** 03 39 0D 0A

Returns: the current measurement mode is level meter mode.

02 01 41 **31** 03 70 0D 0A

CALp1: Set Calibration Level and Calibrate by Measurement

☆**Note:** When CAL instruction is correctly received by the sound level meter, two ACK will be returned at the beginning and the end of the calibration (several seconds will be spent by the calibration). In the calibration history, ending with symbol **M** indicate the record was calibrate by the method of by Measurement.

	Instruction			Parameters
Explanation	CAL			p1: Calibration level; Range: 0~199.9; Default: 93.8
ASCII	C	A	L	93.8
Hex	43H	41H	4CH	39H，33H，2EH，38H
Byte	1	1	1	1~5
Return	ACK / NAK			

Example 1: set the calibration level as 94dB and calibrate by measurement.

02 01 43 **43 41 4C 39 34** 03 00 0D 0A

Return: ACK.

02 01 06 03 06 0D 0A

Return again after calibration finished: ACK

02 01 06 03 06 0D 0A

Example 2: set the calibration level as 113.8dB and calibrate by measurement.

02 01 43 **43 41 4C 31 31 33 2E 38** 03 28 0D 0A

Return: ACK.

02 01 06 03 06 0D 0A

Return again after calibration finished: ACK

02 01 06 03 06 0D 0A

CAL?: Query Calibration Level and Calibration Factor

	Instruction			Parameters
Explanation	MEM			Query parameter: ?
ASCII	C	A	L	?
Hex	43H	41H	4CH	3FH
Byte	1	1	1	1
Return	Return the value of the calibration level and calibration factor			

Example: query the calibration level and calibration factor.

02 01 43 **43 41 4C 3F** 03 32 0D 0A

Return: the current calibration level is 094.0dB, the calibration factor is 000.00dB.

02 01 41 **30 39 34 2E 30 2C 2B 30 30 30 2E 30 30** 03 7B 0D 0A

CAFp1: Calibrate by Calibration Factor

This instruction can modify the calibration factor. In the calibration history, code “F” at the end of each line means by calibration factor.

	Instruction	Parameters
Explanation	CAF	p1: Calibration factor; Range: -199.99~+199.99 (“+” sign can be omitted);

				Default: 0
ASCII	C	A	F	0
Hex	43H	41H	46H	30H
Byte	1	1	1	1~7
Return	ACK / NAK			

Example: set the calibration factor value as 0.74dB (“+” sign is omitted).

02 01 43 **43 41 46 30 2E 37 34** 03 1A 0D 0A

Return: ACK.

02 01 06 03 06 0D 0A

CAF?: Query Calibration History

Query the most recent 4 group history of calibration.

	Instruction			**Parameters**
Explanation	CAF			Query parameter: ?
ASCII	C	A	F	?
Hex	43H	41H	46H	3FH
Byte	1	1	1	1
Return	Returns the most recent 4 group history of calibration. Format “Year/Month/day, hour:minute:second, calibration factor, code”. Code: M=By Measurement, F=By Calibration Factor.			

Example: query the calibration history.

02 01 43 **43 41 46 3F** 03 38 0D 0A

Return: the data returned by this instruction use a slash “/” split date, use a colon “,” split time. Calibration history is 2011/08/04, 17:03:28, +001.29, F, 2011/08/04, 17:03:02, +001.25, F, 2011/08/04, 17:02:20, +000.71, F, 2011/08/04, 17:02:00, +001.27, M.

02 01 41 **32 30 31 31 2F 30 38 2F 30 34 2C 31 37 3A 30 33 3A 32 38 2C 2B 30 30 31 2E 32 39 2C 46 2C 32 30 31 31 2F 30 38 2F 30 34 2C 31 37 3A 30 33 3A 30 32 2C 2B 30 30 31 2E 32 35 2C 46 2C 32 30 31 31 2F 30 38 2F 30 34 2C 31 37 3A 30 32 3A 32 30 2C 2B 30 30 30 2E 37 31 2C 46 2C 32 30 31**

31 2F 30 38 2F 30 34 2C 31 37 3A 30 32 3A 30 30 2C 2B 30 30 31 2E 32 37 2C 4D 03 62 0D 0A

BSEp1_p2_p3_p4_p5_p6_p7: Measurement Setup

Set the delay, integral period, repeat, and logger setup.

	Instruction			**P1**	**P2**	**P3**	**P4**	**P5**	**P6**	**P7**
Explanation	BSE			p1: delay; 1~60=1~60s; 61=Sync. 1m; 62=Sync. 15m; 63=Sync. 30m; 64=Sync. 1h; Default: 1	p2: integral period; 0=Inf; 1~59=1~59s; 60~118=1~59m; 119~142=1h~24h; Default: 0	p3: repeat; 0=Inf; 1~9999=1~9999 times; Default: 0	p4: SWN logger; 0=disable; 1=enable; Default: 0	p5:SWN logger ;step 0=0.1s; 1=0.2s; 2=0.5s; 3~61=1~59s; 62~120=1~59m; 121~144=1h~24h; Default: 3	p6:CSD logger; 0=disable; 1=enable; Default: 0	p7:CSD logger step; 0~58=1~59s; 59~117=1~59m; 118~141=1~24h; Default: 59
ASCII	B	S	E	1	0	0	0	3	0	59
Hex	42H	53H	45H	31H	30H	30H	30H	33H	30H	35H, 39H
Byte	1	1	1	1~2	1~3	1~4	1	1~3	1	1~2
Return	Returns: 0=setting succeed, MicroSD card is OK; 1=setting succeed, but the MicroSD card is abnormal; 2=setting succeed, but no MicroSD card detected.									

Example: set delay as 2s, integral period as 5m, repeat as infinite, SWN logger enable, SWN logger step as 0.2s, CSD logger disable, CSD logger step as 2s.

02 01 43 **42 53 45 32 20 36 34 20 30 20 31 20 31 20 31 20 31** 03 17 0D 0A

Returns: setting succeeds, MicroSD card is OK.

02 01 41 **30** 03 71 0D 0A

BSE?: Query Measurement Setup

	Instruction			Parameters
Explanation	BSE			Query parameter: ?
ASCII	B	S	E	?
Hex	42H	53H	45H	3FH
Byte	1	1	1	1
Return	Return parameter of measurement setup: delay, integral period, repeat, SWN logger, SWN logger step, CSD Logger, CSD Logger step.			

Example: query the measurement setup.

02 01 43 **42 53 45 3F** 03 28 0D 0A

Returns: the current measurement setup: delay=2s, integral period=5min, repeat=infinite, SWN logger=enable, SWN logger step= 0.2s, CSD logger=enable, CSD logger step=2s.

02 01 41 **30 32 2C 30 36 34 2C 30 30 30 30 2C 31 2C 30 30 31 2C 31 2C 30 30 31** 03 71 0D 0A

RNS?: Query Measurement Range

	Instruction			Parameters
Explanation	RNG			Query parameter: ?
ASCII	R	N	S	?
Hex	52H	4EH	53H	3FH
Byte	1	1	1	1
Return	Return measurement range			

Example: query measurement range.

02 01 43 **52 4E 53 3F** 03 33 0D 0A

Return: linearity, dynamic and peak C range is 22.8-133.8, 12.8-133.8, 44.8-136.8.

02 01 41 **30 32 32 2E 38 7E 31 33 33 2E 38 2C 30 31 32 2E 38 7E 31 33 33 2E 38 2C 30 34 34 2E 38 7E 31 33 36 2E 38** 03 38 0D 0A

ICPp1: Set ICCP Power

	Instruction			Parameters
Explanation	ICP			p1: ICCP power state; 0=Enable; 1=Disable; Default: 0
ASCII	I	C	P	0
Hex	49H	43H	50H	30H
Byte	1	1	1	1
Return	ACK / NAK			

Example: enable ICCP power:

02 01 43 **49 43 50 30** 03 29 0D 0A

Return: ACK.

02 01 06 03 06 0D 0A

ICP?: Query ICCP Power State

	Instruction			Parameters
Explanation	ICP			Query parameter: ?
ASCII	I	C	P	?
Hex	49H	43H	50H	3FH
Byte	1	1	1	1
Return	Return ICCP power state			

Example: query ICCP power state

02 01 43 **49 43 50 3F** 03 26 0D 0A

Return: ICCP power is enable

02 01 41 **30** 03 71 0D 0A

PR1p1_p2_p3_p4：Set Profile1

	Instruction			P1	P2	P3	P4
Explanation	PR1			p1: Filter; 0=A; 1=B; 2=C; 3=Z; Default: 0	p2: Detector; 0=Fast; 1=Slow; 2=Imp; Default: 0	p3: Integration mode; 0=SPL; 1=PEAK; 2=LEQ; 3=MAX; 4=MIN; Default: 0	p4: SWN Logger; 0=LEQ; 1=PEAK; 2=MAX; 3=MIN; Default: 0
ASCII	P	R	1	0	0	0	0
Hex	50H	52H	31H	30H	30H	30H	30H
Byte	1	1	1	1	1	1	1
Return	ACK / NAK						

Example: set Profile1 as A, Fast, SPL and save LEQ.

02 01 43 **50 52 31 30 20 30 20 30 20 30** 03 50 0D 0A

Return: ACK.

02 01 06 03 06 0D 0A

PR1?: Query Profile1 Setting

	Instruction			Parameters
Explanation	PR1			Query parameter: ?
ASCII	P	R	1	?
Hex	50H	52H	31H	3FH
Byte	1	1	1	1
Return	Return Profile1 setting			

Example: query Profile1 setting.

02 01 43 **50 52 31 3F** 03 4F 0D 0A

Return: current Profile1 setting is A, Fast, SPL, save LEQ.

02 01 41 **30 2C 30 2C 30 2C 30** 03 6D 0D 0A

PR2p1_p2_p3_p4: Set Profile2

Except the instruction is “PR2” and the default filter is 2 (C-weighting), all others are same to the “PR1”.

PR2?: Query Profile2 Setting

Except the instruction is “PR2”, all others are same to the “PR1?”.

PR3p1_p2_p3_p4: Set Profile3

Except the instruction is “PR3” and the default filter is 3 (Z-weighting), all others are same to the “PR1”.

PR3?: Query Profile3 Setting

Except the instruction is “PR3”, all others are same to the “PR1?”.

ALMp1: Set Alarm Threshold

	Instruction			**Parameters**
Explanation	ALM			p1: Alarm threshold; Range: 20~200; Default: 100
ASCII	A	L	M	100
Hex	41H	4CH	4DH	31H, 30H, 30H
Byte	1	1	1	1~3
Return	ACK / NAK			

Example: setting alarm threshold as 100dB.

02 01 43 **41 4C 4D 31 30 30** 03 32 0D 0A

Return: ACK.

02 01 06 03 06 0D 0A

ALM?: Query the Alarm Threshold Setting

	Instruction			Parameters
Explanation	ALM			Query parameter: ?
ASCII	A	L	M	?
Hex	41H	4CH	4DH	3FH
Byte	1	1	1	1
Return	Return alarm threshold			

Example: query alarm threshold.

02 01 43 **41 4C 4D 3F** 03 3C 0D 0A

Return: the current alarm threshold is 100dB.

02 01 41 **31 30 30** 03 70 0D 0A

ETFp1_p2_p3_p4_p5: Set Extended Function

	Instruction			P1	P2	P3	P4	P5
Explanation	ETF			p1: 3Profile Screen; 0=Disable; 1=Enable	p2: Statistical Screen; 0=Disable; 1=Enable	p3: Time History Screen; 0=Disable; 1=Enable	p4: Custom Screen; 0=Disable; 1=Enable	p5: GPS Screen; 0=Disable; 1=Enable
ASCII	E	T	F	1	1	1	1	1
Hex	45 H	54 H	46 H	31H	31H	31H	31H	31H
Byte	1	1	1	1	1	1	1	1
Return	ACK / NAK							

Example: enable 3Profile, statistical, time history, custom, GPS.

02 01 43 **45 54 46 31 20 31 20 31 20 31 20 31** 03 25 0D 0A

Return: ACK

02 01 06 03 06 0D 0A

ETF?: Query Extended Function Setting

	Instruction			Parameters
Explanation	ETF			Query parameter: ?
ASCII	E	T	F	?
Hex	45H	54H	46H	3FH
Byte	1	1	1	1
Return	Return the extended function setting			

Example: query the extended function setting

02 01 43 **45 54 46 3F** 03 2B 0D 0A

Return: 3Profile, statistical, time history, custom and GPS are all enable

02 01 41 **31 2C 31 2C 31 2C 31 2C 31** 03 70 0D 0A

STSp1_p2_p3……p11_p12: Set Statistical

	Instruction			P1	P2	P3~P12
Explanation	STS			p1: Filter 0=A; 1=B; 2=C; 3=Z; Default: 0	p2: Detector 0=F; 1=S; 2=I; Default: 0	p3~p12: statistical percentage; Range: 1~99; Default: 10, 20, 30, 40, 50, 60, 70, 80, 90, 99
ASCII	S	T	S	0	0	10_20_30_40_50_ 60_70_80_90_99
Hex	53H	54H	53H	30H	30H	31H, 30H, 20H, 32H, 30H, 20H, 33H, 30H, 20H, 34H, 30H, 20H, 35H, 30H, 20H, 35H, 30H, 20H, 36H, 30H, 20H, 37H, 30H, 20H, 38H, 30H, 20H, 39H, 30H, 20H, 39H, 39H
Byte	1	1	1	1	1	10~20+9 (spaces)

Return	ACK / NAK

Example: set filter as B, detector as I, percentage as 10, 20, 30, 40, 50, 60, 70, 80, 90 and 99.

02 01 43 **53 54 53 31 20 32 20 31 30 20 32 30 20 33 30 20 34 30 20 35 30 20 36 30 20 37 30 20 38 30 20 39 30 20 39 39** 03 35 0D 0A

Return: ACK.

02 01 06 03 06 0D 0A

STS?: Query Statistical

	Instruction			Parameters
Explanation	STS			Query parameter: ?
ASCII	S	T	S	?
Hex	53H	54H	53H	3FH
Byte	1	1	1	1
Return	Return filter, detector and 10 percentage of statistical			

Example: query statistical

02 01 43 **53 54 53 3F** 03 28 0D 0A

Return: filter=B, detector=I, percentage=10, 20, 30, 40, 50, 60, 70, 80, 90, 99.

02 01 41 **31 2C 32 2C 31 30 2C 32 30 2C 33 30 2C 34 30 2C 35 30 2C 36 30 2C 37 30 2C 38 30 2C 39 30 2C 39 39** 03 6F 0D 0A

HISp1_p2: Set Time History

	Instruction			Parameters 1	Parameters 2
Explanation	HIS			p1: Profile; 0=Profile1; 1=Profile2; 2=Profile3; Default: 1	p2: Duration; 0=1min; 1=2min; 2=10min; Default: 1
ASCII	H	I	S	1	1
Hex	48H	49H	53H	31H	31H
Byte	1	1	1	1	1

Return	ACK / NAK

Example: set Profile2 as data sources and duration as 2min.

02 01 43 **48 49 53 31 20 31** 03 31 0D 0A

Return: ACK.

02 01 06 03 06 0D 0A

HIS?: Query Time History Setting

	Instruction			Parameters
Explanation	HIS			Query parameter: ?
ASCII	H	I	S	?
Hex	48H	49H	53H	3FH
Byte	1	1	1	1
Return	Return time history setting			

Example: query time history setting.

02 01 43 **48 49 53 3F** 03 2E 0D 0A

Returns: the current data sources=Profile2, duration=2min.

02 01 41 **31 2C 31** 03 6D 0D 0A

OCSp1_p2……p13_p14: Set Octave Threshold

	Instruction			Parameter 1~14
Explanation	OCS			p1~p14: The threshold of LEQA, LEQB, LEQC, LEQZ, 31.5Hz, 63 Hz, 125 Hz, 250 Hz, 500 Hz, 1000 Hz, 2000 Hz, 4000 Hz, 8000 Hz, 16000Hz; Range: 0-199.9; Default: 45, 80, 80, 80, 79, 63, 52, 44, 38, 80, 80, 80, 80, 80
ASCII	O	C	S	45_80_80_80_79_63_52_44_38_80_80_80_80_80
Hex	4FH	43H	53H	34H, 35H, 20H, 38H, 30H, 20H, 38H, 30H, 20H, 38H, 30H, 20H, 37H, 39H, 20H, 36H, 33H, 20H, 35H, 32H, 20H, 34H, 34H, 20H, 33H, 38H, 20H, 38H, 30H, 20H, 38H, 30H, 20H, 38H, 30H, 20H, 38H, 30H, 20H, 38H, 30H, 20H

Byte	1	1	1	28+14 (space)
Return	ACK / NAK			

Example：LEQA: 38, LEQB: 38, LEQC: 38, LEQZ: 38, 31.5: 79, 63: 63, 125: 52, 250: 44, 500: 38, 1000: 38, 2000: 38, 4000: 38, 8000: 38, 16000: 38:

02 01 43 **4F 43 53 33 38 20 33 38 20 33 38 20 33 38 20 37 39 20 36 33 20 35 32 20 34 34 20 33 38 20 33 38 20 33 38 20 33 38 20 33 38 20 33 38 20 33 38** 03 30 0D 0A

Return: ACK:

02 01 06 **03** 06 0D 0A

OCS?: Query Octave Threshold Setting

	Instruction			**Parameters**
Explanation	OCS			Query parameter: ?
ASCII	O	C	S	?
Hex	4FH	43H	53H	3FH
Byte	1	1	1	1
Return	Return octave threshold setting			

Example: query octave threshold setting.

02 01 43 **4F 43 53 3F** 03 23 0D 0A

Returns: return octave threshold: LAeq=038.0dB, LBeq=038.0dB, LCeq=038.0dB, LZeq=038.0dB, 31.5Hz=079.0dB, 63Hz=063.0dB, 125Hz=052.0dB, 250Hz=044.0dB, 500Hz=038.0dB, 1000Hz=038.0dB, 2000Hz=038.0dB, 4000Hz=038.0dB, 8000Hz=038.0dB, 16000Hz =038.0dB.

02 01 41 **30 33 38 2E 30 2C 30 33 38 2E 30 2C 30 33 38 2E 30 2C 30 33 38 2E 30 2C 30 37 39 2E 30 2C 30 36 33 2E 30 2C 30 35 32 2E 30 2C 30 34 34 2E 30 2C 30 33 38 2E 30 2C 30 33 38 2E 30 2C 30 33 38 2E 30 2C 30 33 38 2E 30 2C 30 33 38 2E 30 2C 30 33 38 2E 30** 03 61 0D 0A

CUSp1_p2_p3_p4：Set Custom Measure

	Instruction			P1	P2	P3	P4
Explanation	CUS			p1: Group; Range: 1~14	p2: Filter; 0=A; 1=B; 2=C; 3=Z	p3: Detector; 0=Fast; 1=Slow; 2=Imp.	p4: Mode; 0=SPL; 1=SD; 2=SEL; 3=E; 4=Max; 5=Min; 6=Peak; 7=LEQ; 8=LN1; …… 17=LN10
ASCII	C	U	S	1	0	0	0
Hex	43H	55H	53H	31H	30H	30H	30H
Byte	1	1	1	1~2	1	1	1~2
Return	ACK / NAK						

Example: set custom measurement of group 1 to B-weighting, Fast, Peak.

02 01 43 **43 55 53 31 20 31 20 30 20 36** 03 20 0D 0A

Return: ACK

02 01 06 **03** 06 0D 0A

Default value of each group in custom measurement (parameter with * is actually useless):

	Filter	Detector	Mode	Meaning
Custom 1	0	0	7	A, Fast*, LEQ
Custom 2	0	0	8	A*, Fast*, LN1
Custom 3	0	0	12	A*, Fast*, LN5
Custom 4	0	0	16	A*, Fast*, LN 9
Custom 5	0	0	4	A, Fast, Max

Custom 6	0	0	5	A, Fast, Min
Custom 7	0	0	1	A, Fast, SD
Custom 8	0	0	0	A, Fast, SPL
Custom 9	1	0	0	B, Fast, SPL
Custom 10	2	0	0	C, Fast, SPL
Custom 11	3	0	0	Z, Fast, SPL
Custom 12	0	0	2	A, Fast*, SEL
Custom 13	0	0	3	A, Fast*, E
Custom 14	2	0	6	C, Fast*, Peak

CUSp1_?: Query Custom Measure Setting

	Instruction			**P1**	**P2**
Explanation	CUS			p1: Group 1~14	Query parameter: ?
ASCII	C	U	S	1	?
Hex	43H	55H	53H	31H	3FH
Byte	1	1	1	1~2	1
Return	Return custom measure setting				

Example: query custom measure settings of group 12.

02 01 43 **43 55 53 31 32 20 3F** 03 1A 0D 0A

Return: the setting of group 12 is A-weighting, Fast, E.

02 01 41 **31 32 2C 30 2C 30 2C 30 33** 03 6D 0D 0A

TISp1_p2_p3_p4_p5: Set Timer

	Instruction	**P1**	**P2**	**P3**	**P4**	**P5**
Explanation	TIS	P1: Switch; 0=OFF; 1=ON; Default: 0	p2: Start Day; 0=Ignore; 1~31= 1~31 day	p3: Start hour; 0~23= 0~23h; Default:	p4: Start minute; 0~59= 0~59m; Default: 0	P5: Repeat period; 1~59= 1~59m;

				form today; Default: 0	12		60~83= 1~24h; Default: 1
ASCII	T	I	S	0	0	12	0	1
Hex	54H	49H	53H	30H	30H	31H, 32H	30H	31H
Byte	1	1	1	1	1	1~2	1~2	1~2
Return	ACK / NAK							

Example: set the Timer as switch: ON, start day: Ignore, start hour: 12:00, repeat period: 1m.

02 01 43 **54 49 53 31 20 30 20 31 32 20 30 20 31** 03 0E 0D 0A

Return: ACK

02 01 06 03 06 0D 0A

TIS?: Query Timer Setting

	Instruction			**Parameters**
Explanation	TIS			Query parameter: ?
ASCII	54H	49H	53H	?
Hex	1	1	1	3FH
Byte	54H	49H	53H	1
Return	Return Timer setting			

Example: query Timer setting.

02 01 43 **54 49 53 3F** 03 32 0D 0A

Return: Timer setting is switch=OFF, start day=Ignore, Start Time=12:00, Repeat period=1m.

02 01 41 **30 2C 30 30 2C 31 32 3A 30 30 2C 30 31** 03 65 0D 0A

CONp1：Set Contrast

	Instruction	**Parameters**
Explanation	CON	p1: Contrast; Range:0~14; Default: 7

ASCII	C	O	N	7
Hex	43H	4FH	4EH	37H
Byte	1	1	1	1
Return	ACK / NAK			

Example: set the contrast as 9.

02 01 43 **43 4F 4E 39** 03 38 0D 0A

Return: ACK

02 01 06 03 06 0D 0A

CON?: Query Contrast Setting

	Instruction			**Parameters**
Explanation	CON			Query parameter: ?
ASCII	C	O	N	?
Hex	43H	4FH	4EH	3FH
Byte	1	1	1	1
Return	Return contrast setting			

Example: query contrast setting

02 01 43 **43 4F 4E 3F** 03 3E 0D 0A

Returns: the current contrast is 7

02 01 41 **30 37** 03 46 0D 0A

BLTp1_p2：Set Backlight

	Instruction			**Parameter 1**	**Parameter 2**
Explanation	BLT			p1: TimeOut; 0=ON, Auto shut down; 1=OFF, Never turn off; Default: 0	p2: Delay; 0=10s; 1=20s; 2=30s; 3=40s; 4=50s; 5=60s; Default: 0
ASCII	B	L	T	0	0
Hex	42H	4CH	54H	30H	30H
Byte	1	1	1	1	1

Return	ACK / NAK

Example: set backlight as timeout: ON, delay: 20s

02 01 43 **42 4C 54 30 20 31** 03 38 0D 0A

Return: ACK

02 01 06 03 06 0D 0A

BLT?: Query Backlight Setting

	Instruction			Parameters
Explanation	BLT			Query parameter: ?
ASCII	B	L	T	?
Hex	42H	4CH	54H	3FH
Byte	1	1	1	1
Return	Return backlight settings			

Example: query the backlight settings

02 01 43 **42 4C 54 3F** 03 26 0D 0A

Return: the current backlight setting is timeout=OFF, delay=20s (delay is useless when backlight timeout is OFF)

02 01 41 **31 2C 31** 03 6D 0D 0A

BAT?: Query Battery State

	Instruction			Parameters
Explanation	BAT			Query parameter: ?
ASCII	B	A	T	?
Hex	42H	41H	54H	3FH
Byte	1	1	1	1
Return	Returns the power state and supply voltage Power state: 0=Battery; 1=External power; 2=USB power Supply voltage: xx.xx V			

Example: query battery state

02 01 43 **42 41 54 3F** 03 2B 0D 0A

Returns: the current battery state is external power supply, supply voltage is 9.24V

02 01 41 **31 2C 30 39 2E 32 34** 03 7D 0D 0A

TRGp1：Set Trigger

	Instruction			Parameters
Explanation	TRG			p1: Trigger switch; 0=OFF; 1=ON; Default: 0
ASCII	T	R	G	0
Hex	54H	52H	47H	30H
Byte	1	1	1	1
Return	ACK / NAK			

Example: set trigger as OFF

02 01 43 **54 52 47 30** 03 32 0D 0A

Return: ACK

02 01 06 03 06 0D 0A

TRG?：Query Trigger Setting

	Instruction			Parameters
Explanation	TRG			Query parameter: ?
ASCII	T	R	G	?
Hex	54H	52H	47H	3FH
Byte	1	1	1	1
Return	Return Trigger settings			

Example: query trigger setting

02 01 43 **54 52 47 3F** 03 3D 0D 0A

Returns: the current trigger setting is OFF

02 01 41 **30** 03 71 0D 0A

DATp1_p2_p3_p4：Set Date

	Instruction			P1	P2	P3	P4
Explanation	DAT			p1: Date format; 0=Year/Month/Day; 1=Month/Day/Year; 2=Day/Year/Month; Default: 0	p2: Year; Range: 2000~2999	p3: Month; Range: 1~12	p4: Day; Range: 1~31
ASCII	D	A	T	0	2011	1	1
Hex	44H	41H	54H	30H	32H, 30H 31H, 31H	31H	31H
Byte	1	1	1	1	4	1~2	1~2
Return	ACK / NAK						

Example: set the date format as year/month/day, date: 5th August 2011

02 01 43 **44 41 54 30 20 32 30 31 31 20 38 20 35** 03 0D 0D 0A

Return: ACK

02 01 06 03 06 0D 0A

DAT?：Query Date Setting

	Instruction			Parameters
Explanation	DAT			Query parameter: ?
ASCII	D	A	T	?
Hex	44H	41H	54H	3FH
Byte	1	1	1	1
Return	Return date setting			

Example: query date

02 01 43 **44 41 54 3F** 03 2D 0D 0A

Return: the current date format=year/month/day, date=5th August 2011

02 01 41 **30 2C 32 30 31 31 2F 30 38 2F 30 35** 03 52 0D 0A

HORp1_p2_p3：Set Time

	Instruction			P1	P2	P3
Explanation	HOR			p1: Hour; Range: 0~23h	p2: Minute; Range: 0~59m	p3: Second; Range: 0~59s
ASCII	H	O	R	1	1	1
Hex	48H	4FH	52H	31H	31H	31H
Byte	1	1	1	1~2	1~2	1~2
Return	ACK / NAK					

Example: set the time as 18:37:30

02 01 43 **48 4F 52 31 38 20 33 37 20 33 30** 03 18 0D 0A

Return: ACK

02 01 06 03 06 0D 0A

HOR?：Query Time Setting

	Instruction			Parameters
Explanation	HOR			Query parameter: ?
ASCII	H	O	R	?
Hex	48H	4FH	52H	3FH
Byte	1	1	1	1
Return	Return time settings			

Example: query time setting

02 01 43 **48 4F 52 3F** 03 29 0D 0A

Returns: the current time is 18:37:48

02 01 41 **31 38 3A 33 37 3A 34 38** 03 40 0D 0A

PWOp1：Set Auto Power Off

	Instruction	Parameters
Explanation	PWO	p1: Auto power off time; 0=1min; 1=5min; 2=10min;

				3=30min; 4=OFF; Default: 4
ASCII	P	W	O	4
Hex	50H	57H	4FH	34H
Byte	1	1	1	1
Return	ACK / NAK			

Example: set auto power off as OFF

02 01 43 **50 57 4F 34** 03 3F 0D 0A

Return: ACK

02 01 06 03 06 0D 0A

PWO?：Query Auto Power Off Setting

	Instruction			**Parameters**
Explanation	PWO			Query parameter: ?
ASCII	P	W	O	?
Hex	50H	57H	4FH	3FH
Byte	1	1	1	1
Return	Return auto power off settings			

Example: query auto power off settings

02 01 43 **50 57 4F 3F** 03 34 0D 0A

Returns: the current auto power off setting is OFF

02 01 41 **34** 03 75 0D 0A

OPMp1：Set Boot Mode

	Instruction	**Parameters**
Explanation	OPM	p1: Boot mode; 0=Normal; 1=Power & Boot; 2=Boot & Auto Measure; Default: 0

ASCII	O	P	M	0
Hex	4FH	50H	4DH	30H
Byte	1	1	1	1
Return	ACK / NAK			

Example: set bott mode as normal

02 01 43 **4F 50 4D 30** 03 21 0D 0A

Return: ACK

02 01 06 03 06 0D 0A

OPM?：Query Boot Mode Setting

	Instruction			**Parameters**
Explanation	OPM			Query parameter: ?
ASCII	O	P	M	?
Hex	4FH	50H	4DH	3FH
Byte	1	1	1	1
Return	Return boot mode setting			

Example: query boot mode

02 01 43 **4F 50 4D** 3F 03 2E 0D 0A

Return: the current boot mode is normal

02 01 41 **30** 03 71 0D 0A

UMDp1: Set USB Mode

	Instruction			**Parameters**
Explanation	UMD			p1: USB Mode; 0=Always Ask; 1=U Disk Mode; 2=Modem Mode; Default: 0
ASCII	U	M	D	0
Hex	55H	4DH	44H	30H

Byte	1	1	1	1
Return	ACK / NAK			

Example: set to modem mode

02 01 43 **55 4D 44 32** 03 2D 0D 0A

Return: ACK

02 01 06 03 06 0D 0A

UMD?: Query USB Mode Setting

	Instruction			Parameters
Explanation	UMD			Query parameter: ?
ASCII	U	M	D	?
Hex	55H	4DH	44H	3FH
Byte	1	1	1	1
Return	Return USB mode setting			

Example: query USB mode setting

02 01 43 **55 4D 44 3F** 03 20 0D 0A

Return: the current USB mode is modem mode

02 01 41 **32** 03 73 0D 0A

GPDp1_p2: Set GPS

	Instruction			P1	P2
Explanation	GPD			p1: GPS switch; 0=OFF; 1=ON; Default: 0	p2: Auto time sync; 0=OFF; 1=ON; Default: 0
ASCII	G	P	D	0	0
Hex	47H	50H	44H	30H	30H
Byte	1	1	1	1	1
Return	ACK / NAK				

Example: set GPS as switch: ON, auto time sync: ON

02 01 43 **47 50 44 31 20 31** 03 30 0D 0A

Return: ACK

02 01 06 03 06 0D 0A

GPD?: Query GPS Setting

	Instruction			Parameters
Explanation	GPD			Query parameter: ?
ASCII	G	P	D	?
Hex	47H	50H	44H	3FH
Byte	1	1	1	1
Return	Return GPS setting			

Example: query GPS setting

02 01 43 **47 50 44 3F** 03 2D 0D 0A

Returns: the current GPS setting is switch=ON, auto time sync=ON

02 01 41 **31 2C 31** 03 6F 0D 0A

VER?: Query About Information

	Instruction			Parameters
Explanation	VER			Query parameter: ?
ASCII	V	E	R	?
Hex	56H	45H	52H	3FH
Byte	1	1	1	1
Return	Return the about information			

Example: query about information

02 01 43 **56 45 52 3F** 03 3D 0D 0A

Returns: type=309S, class=2, S/N=490001, version=3.00.141020, HWID=P0274.03.B11

02 01 41 **33 30 39 53 2C 32 2C 34 39 30 30 30 31 2C 33 2E 30 30 2E 31 34 31 30 32 30 2C 50 30 32 37 34 2E 30 33 2E 42 31 31 03 33 0D 0A** 03 70 0D 0A

LNGp1：Set Language

	Instruction			Parameters
Explanation	LNG			p1: Language selection; 0=English; 1=Chinese; 2=Portuguese; 3=Spanish; 4=German; 5=French; Default: 0
ASCII	L	N	G	0
Hex	4CH	4EH	47H	30H
Byte	1	1	1	1
Return	ACK / NAK			

Example: set the language as Chinese

02 01 43 **4C 4E 47 31** 03 37 0D 0A

Return: ACK

02 01 06 03 06 0D 0A

LNG?：Query Language Setting

	Instruction			Parameters
Explanation	LNG			Query parameter: ?
ASCII	L	N	G	?
Hex	4CH	4EH	47H	3FH
Byte	1	1	1	1
Return	Return the language setting			

Example: query language setting

02 01 43 **4C 4E 47 3F** 03 39 0D 0A

Returns: the current language is Chinese

02 01 41 **31** 03 70 0D 0A

OUTp1_p2_p3_p4：Set Output

	Instruction			P1	P2	P3	P4
Explanation	OUT			p1: Filter of SLM; 0=A; 1=B; 2=C; 3=Z; Default: 0	p2: Detector of SLM; 0=Fast; 1=Slow; 2=Imp.; Default: 0	p3: Mode of SLM; 0=SPL; 1=LEQ; 2=Peak; Default: 0	p4: Output of Octave; 0=LAeq; 1=LBeq; 2=LCeq; 3=LZeq; 4=31.5Hz; 5=63Hz; 6=125Hz; 7=250Hz; 8=500Hz; 9=1000Hz; 10=2000Hz; 11=4000Hz; 12=8000Hz; 13=16000Hz; Default: 0
ASCII	O	U	T	0	0	0	0
Hex	4FH	55H	54H	30H	30H	30H	30H
Byte	1	1	1	1	1	1	1~2
Return	ACK / NAK						

Example: set the output to A-weighting, Fast, SPL for SLM. Set the output to LAeq for Octave

02 01 43 **4F 55 54 30 20 30 20 30 20** 30 03 2D 0D 0A

Return: ACK

02 01 06 03 06 0D 0A

OUT?：Query Output Setting

	Instruction			Parameters
Explanation	OUT			Query parameter: ?
ASCII	O	U	T	?
Hex	4FH	55H	54H	3FH
Byte	1	1	1	1
Return	Return output setting			

Example: query output setting

02 01 43 **4F 55 54 3F** 03 32 0D 0A

Return: the output for SLM=A-weighting, Fast, SPL. For Octave=LAeq

02 01 41 **30 2C 30 2C 30 2C 30** 03 6D 0D 0A

RES: Apply Factory Settings

☆Note: After receipt of the ACK, user must wait at least 6 seconds to finish the operation.

	Instruction			Parameters
Explanation	RES			None
ASCII	R	E	S	None
Hex	52H	45H	53H	None
Byte	1	1	1	None
Return	ACK / NAK			

Example: apply the factory settings

02 01 43 **52 45 53** 03 07 0D 0A

Return: ACK. Wait at least 6 seconds after receipt of ACK

02 01 06 03 06 0D 0A

STAp1：Start / Stop Measurement

	Instruction	Parameters
Explanation	STA	p1: Start / Stop measurement; 0=Stop;

				1=Start
ASCII	S	T	A	1
Hex	53H	54H	41H	31H
Byte	1	1	1	1
Return	ACK / NAK			

Example: start measurement

02 01 43 **53 54 41 31** 03 34 0D 0A

Return: ACK

02 01 06 03 06 0D 0A

STA?: Query Measurement State

	Instruction			**Parameters**
Explanation	STA			Query parameter: ?
ASCII	S	T	A	?
Hex	53H	54H	41H	3FH
Byte	1	1	1	1
Return	Return measurement state			

Example: query the measurement state

02 01 43 **53 54 41 3F** 03 3A 0D 0A

Returns: the measurement state is start (running)

02 01 41 **31** 03 70 0D 0A

☆Note: The following instructions are to query the sound level meter measurements data. They contain the "return manner" parameter, it means:

Stop return: The sound level meter no longer to return measurements data every second after received this instruction.

Single return: The sound level meter will return the measurements data on time after received the instruction.

Continuous return: Automatically return the measurements data every second after received the instruction.

Therefore, the "return manner" parameter in the instruction can be set to 2 and send to the sound level meter, sound level meter will return the latest measurements data every second.

DMAp1_?: Query the Main Screen Data

	Instruction			P1	P2
Explanation	DMA			p1:Return manner 0=Stop return 1=Single return 2=Continuous return	Query parameter: ?
ASCII	D	M	A	1	?
Hex	44H	4DH	41H	31H	3FH
Byte	1	1	1	1	1
Return	Return the main screen data Filter: 0=A, 1=B, 2=C, 3=Z Detector: 0=Fast, 1=Slow, 2=Imp. Mode: 0=SPL, 1=PEAK, 2=LEQ, 3=MAX, 4=MIN Measurement data: The value of the main screen				

Example: query the data of the main screen, and return only once

02 01 43 **44 4D 41 31 20 3F** 03 25 0D 0A

Returns: the current main screen is: B-weighting, Slow, measurement data 066.1dB

02 01 41 **31 2C 31 2C 32 2C 30 36 36 2E 31** 03 70 0D 0A

TPRp1_?: Query 3-Profile Screen Data

	Instruction			P1	P2
Explanation	TPR			p1: Return manner; 0=Stop return; 1=Single return; 2=Continuous return	Query parameter: ?
ASCII	T	P	R	1	?
Hex	54H	50H	52H	31H	3FH

Byte	1	1	1	1	1
Return	Return 3-Profile screen data Profile 1: Filter, Detector, Mode, Data Profile 2: Filter, Detector, Mode, Data Profile 3: Filter, Detector, Mode, Data				

Example: query 3-Profile screen data

02 01 43 **54 50 52 31 20 3F** 03 3B 0D 0A

Returns: the current 3-Profile screen data: profile 1: B-weighting, LEQ, 066.1dB; profile 2: C-weighting, Fast, SPL, 067.1dB; profile 3: Z-weighting, Fast, SPL, 067.4dB

02 01 41 **31 2C 31 2C 32 2C 30 36 36 2E 31 2C 32 2C 30 2C 30 2C 30 36 37 2E 31 2C 33 2C 30 2C 30 2C 30 36 37 2E 34** 03 74 0D 0A

DLNp1_?: Query Statistical Analysis Data (LN)

	Instruction			P1	P2
Explanation	DLN			p1: Return manner; 0=Stop return; 1=Single return; 2=Continuous return	Query parameter: ?
ASCII	D	L	N	1	?
Hex	44H	4CH	4EH	31H	3FH
Byte	1	1	1	1	1
Return	Return statistical analysis (LN) data Filter: 0=A, 1=B, 2=C, 3=Z Detector: 0=Fast, 1=Slow, 2=Imp. Mode: 0=SPL Group 1 LN percentages and LN statistics …… Group 10 LN percentages and LN statistics				

Example: query statistical analysis (LN) data

02 01 43 **44 4C 4E 31 20 3F** 03 2B 0D 0A

Returns: the current statistical analysis data is: A-weighting, Fast, SPL, LN10=065.4dB, LN20=065.4dB, LN30=065.4dB, LN40=065.3dB, LN50=065.3dB, LN60=065.3dB, LN70=035.2dB, LN80=065.2dB, LN 90=065.2dB, LN99=065.1dB

02 01 41 **30 2C 30 2C 30 2C 31 30 2C 30 36 35 2E 34 2C 32 30 2C 30 36 35 2E 34 2C 33 30 2C 30 36 35 2E 34 2C 34 30 2C 30 36 35 2E 33 2C 35 30 2C 30 36 35 2E 33 2C 36 30 2C 30 36 35 2E 33 2C 37 30 2C 30 36 35 2E 32 2C 38 30 2C 30 36 35 2E 32 2C 39 30 2C 30 36 35 2E 32 2C 39 39 2C 30 36 35 2E 31 2C** 03 58 0D 0A

DCU?：Query Custom Measure Data

	Instruction			P1	P2
Explanation	DCU			p1: Return manner; 0=Stop return; 1=Single return; 2=Continuous return	Query parameter: ?
ASCII	D	C	U	1	?
Hex	44H	43H	55H	31H	3FH
Byte	1	1	1	1	1
Return	Return custom measure data: Group 1Filter, Detector, Mode, Data …… Group 14Filter, Detector, Mode, Data				

Example: query custom measure data

02 01 43 **44 43 55 31 20 3F** 03 3F 0D 0A

Returns: the current custom measure data: Group 0: A-weighting, Fast*, L10, 065.4dB; Group 1: A-weighting, Fast*, L20, 065.4dB; Group 2: A-weighting, Fast*, L60, 065.3dB; Group 3: A-weighting, Fast*, L99, 065.1dB; Group 4: A-weighting, Fast, Min, 064.4dB; Group 5: A-weighting, Fast*, Peak, 081.9dB; Group 6: A-weighting, Fast, Sel, 083.8dB; Group7: A-weighting, Fast, SPL, 065.3dB; Group 8: B-weighting, Fast, SPL, 066.4dB; Group 9: A-weighting, Fast, SD, 005.6dB; Group10: B-weighting, Fast, SD, 007.2dB; Group 11:

A-weighting, Fast*, E, 2.696E-05dB; Group 12: A-weighting, Fast, Max, 65.5dB; Group 13: B-weighting, Fast*, Leq, 066.2dB. ☆Note: Parameters with * are useless

02 01 41 **30 2C 30 2C 30 38 2C 30 36 35 2E 34 2C 30 2C 30 2C 30 39 2C 30 36 35 2E 34 2C 30 2C 30 2C 31 33 2C 30 36 35 2E 33 2C 30 2C 30 2C 31 37 2C 30 36 35 2E 31 2C 30 2C 30 2C 30 35 2C 30 36 34 2E 34 2C 30 2C 30 2C 30 36 2C 30 38 31 2E 39 2C 30 2C 30 2C 30 32 2C 30 38 33 2E 38 2C 30 2C 30 2C 30 2C 30 30 2C 30 36 35 2E 33 2C 31 2C 30 2C 30 30 2C 30 36 36 2E 34 2C 30 2C 30 2C 30 31 2C 30 30 35 2E 36 2C 31 2C 30 2C 30 31 2C 30 30 37 2E 32 2C 30 2C 30 2C 30 33 2C 32 2E 36 39 36 65 2D 30 35 2C 30 2C 30 2C 30 34 2C 30 36 35 2E 35 2C 31 2C 30 2C 30 37 2C 30 36 36 2E 32** 03 2F 0D 0A

DSLp1_p2_?: Query All the Data of the Sound Level Meter

	Instruction			P1	P2	P3
Explanation	DSL			p1: Data group; 0=SPL; 1=SD; 2=SEL; 3=E; 4=Max; 5=Min; 6=Peak; 7=Leq; 8=LN	p1: Return manner; 0=Stop return; 1=Single return; 2=Continuous return	Query parameter: ?
ASCII	D	S	L	0	1	?
Hex	44H	53H	4CH	30H	31H	3FH
Byte	1	1	1	1	1	1
Return	Return the corresponding group data: Group 0: LAF, LAS, LAI, LBF, LBS, LBI, LCF, LCS, LCI, LZF, LZS, LZI Group 1: LAFsd, LASsd, LAIsd, LBFsd, LBSsd, LBIsd, LCFsd, LCSsd,					

	LCIsd, LZFsd, LZSsd, LZIsd Group 2: LAsel, LBsel, LCsel, LZsel Group 3: LAe, LBe, LCe, LZe Group4: LAFmax, LASmax, LAImax, LBFmax, LBSmax, LBImax, LCFmax, LCSmax, LCImax, LZFmax, LZSmax, LZImax Group 5: LAFmin, LASmin, LAImin, LBFmin, LBSmin, LBImin, LCFmin, LCSmin, LCImin, LZFmin, LZSmin, LZImin Group 6: LApeak, LBpeak, LCpeak, LZpeak Group 7: LAeq, LBeq, LCeq, LZeq Group 8: Percentage values and statistics of ten LN

Example: query group 7 (LEQ)

02 01 43 **44 53 4C 37 20 31 20** 3F 03 21 0D 0A

Returns: the LEQ data: LAeq=065.0dB, LBeq=066.2dB; LCeq=067.0dB; LZeq=067.2dB

02 01 41 **30 36 35 2E 30 2C 30 36 36 2E 32 2C 30 36 37 2E 30 2C 30 36 37 2E 32** 03 6E 0D 0A

DOT?: Query Octave Data

	Instruction			P1	P2
Explanation	DOT			p1: Return manner; 0=Stop return; 1=Single return; 2=Continuous return;	Query parameter: ?
ASCII	D	O	T	1	?
Hex	44H	4FH	54H	31H	3FH
Byte	1	1	1	1	1
Return	Return octave data: LAeq, LBeq, LCeq, LZeq, 31.5Hz, 63Hz, 125Hz, 250Hz, 500Hz, 1000Hz, 2000Hz, 4000Hz, 8000Hz, 16000Hz				

Example: query octave data

02 01 43 **44 4F 54 31 20 3F** 03 32 0D 0A

Returns: the current octave data is: LAeq=065.1dB, LBeq=066.3dB, LCeq=0674.1dB, LZeq=067.4dB, 31.5Hz=051.5dB, 63Hz=054.6dB, 125Hz=057.4dB, 250Hz=060.0dB, 500Hz=061.2dB, 1000Hz=060.7dB, 2000Hz=058.1dB, 4000Hz=054.5dB, 8000Hz=049.5dB, 16000Hz=043.2dB

02 01 41 **30 36 35 2E 31 2C 30 36 36 2E 33 2C 30 36 37 2E 31 2C 30 36 37 2E 34 2C 30 35 31 2E 35 2C 30 35 34 2E 36 2C 30 35 37 2E 34 2C 30 36 30 2E 30 2C 30 36 31 2E 32 2C 30 36 30 2E 37 2C 30 35 38 2E 31 2C 30 35 34 2E 35 2C 30 34 39 2E 35 2C 30 34 33 2E 32** 03 6E 0D 0A

CSD：Save Custom Data into MicroSD

	Instruction			Parameters
Explanation	CSD			None
ASCII	C	S	D	None
Hex	43H	53H	44H	None
Byte	1	1	1	None
Return	Return state: 0= Stored successfully, MicroSD OK; 1= Failure to store, MicroSD error; 2=No MicroSD.			

Example: Save CSD

02 01 43 43 53 44 03 17 0D 0A

Return: save successfully, MicroSD OK

02 01 41 30 03 71 0D 0