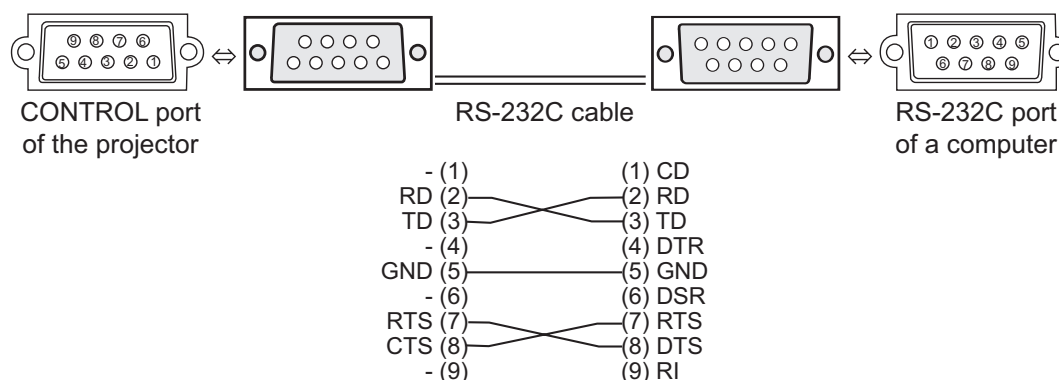


10. RS-232C communication



● Connecting the cable

- (1) Turn off the projector and the computer power supplies.
- (2) Connect the CONTROL port of the projector with a RS-232C port of the computer by a RS-232C cable.
Use the cable that fulfills the specification shown in the previous page.
- (3) Turn on the computer power supply and after the computer has started up, turn on the projector power supply.

● Communications setting

19200 bps, 8N1

1. Protocol

Consist of header (7 bytes) + Command data (6 bytes)

2. Header

BE + EF + 03 + 06 + 00 + CRC_low + CRC_high

CRC_low: Lower byte of CRC flag for command data

CRC_high: Upper byte of CRC flag for command data

3. Command Data

Command Data Chart

byte_0	byte_1	byte_2	byte_3	byte_4	byte_5
Action		Type		Setting code	
low	high	low	high	low	high

Action (byte_0 - 1)

Action	Classification	Content
1	Set	Change setting to desired value.
2	Get	Read projector internal setup value.
4	Increment	Increment setup value by 1.
5	Decrement	Decrement setup value by 1.
6	Execute	Run a command.

Requesting projector status (Get command)

- (1) Send the request code Header + Command data ('02H'+ '00H'+ type (2 bytes)+ '00H'+ '00H') from the computer to the projector.
- (2) The projector returns the response code '1DH'+ data (2 bytes) to the computer.

Changing the projector settings (Set command)

- (1) Send the setting code Header + Command data ('01H'+ '00H'+ type (2 bytes) + setting code (2 bytes)) from the computer to the projector.
- (2) The projector changes the setting based on the above setting code.
- (3) The projector returns the response code '06H' to the computer.

Using the projector default settings (Reset Command)

- (1) The computer sends the default setting code Header + Command data ('06H'+ '00H'+ type (2 bytes) + '00H'+ '00H') to the projector.
- (2) The projector changes the specified setting to the default value.
- (3) The projector returns the response code '06H' to the computer.

Increasing the projector setting value (Increment command)

- (1) The computer sends the increment code Header + Command data ('04H'+ '00H'+ type (2 bytes) + '00H'+ '00H') to the projector.
- (2) The projector increases the setting value on the above setting code.
- (3) The projector returns the response code '06H' to the computer.

Decreasing the projector setting value (Decrement command)

- (1) The computer sends the decrement code Header + Command data ('05H'+ '00H'+ type (2 bytes) + '00H'+ '00H') to the projector.
- (2) The projector decreases the setting value on the above setting code.
- (3) The projector returns the response code '06H' to the computer.

When the projector cannot understand the received command

When the projector cannot understand the received command, the error code '15H' is sent back to the computer.

Sometimes the projector cannot properly receive the command. In such a case, the command is not executed and the error code '15H' is sent back to the computer. If this error code is returned, send the same command again.

When the projector cannot execute the received command.

When the projector cannot execute the received command, the error code '1cH' + 'xxxxH' is sent back to the computer. When the data length is greater than indicated by the data length code, the projector ignore the excess data code.

Conversely when the data length is shorter than indicated by the data length code, an error code will be returned to the computer.

NOTE • Operation cannot be guaranteed when the projector receives an undefined command or data.

- Provide an interval of at least 40ms between the response code and any other code.
- The projector outputs test data when the power supply is switched ON, and when the lamp is lit. Ignore this data.
- Commands are not accepted during warm-up.

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● Command data chart

Names	Operation Type		Header				Command Data		
			CRC	Action	Type	Setting Code			
Power	Set	Turn off	BE EF	03	06 00	2A D3	01 00	00 60	00 00
		Turn off	BE EF	03	06 00	BA D2	01 00	00 60	01 00
	Get	Get	BE EF	03	06 00	19 D3	02 00	00 60	00 00
		(Example return) 00 00 01 00 02 00 (Off) (On) (Cool down)							
Input Source	Set	DVI / M1-D	BE EF	03	06 00	0E D2	01 00	00 20	03 00
		RGB1 / COMPUTER	BE EF	03	06 00	FE D2	01 00	00 20	00 00
		VIDEO	BE EF	03	06 00	6E D3	01 00	00 20	01 00
		S-VIDEO	BE EF	03	06 00	9E D3	01 00	00 20	02 00
		COMPONENT	BE EF	03	06 00	AE D1	01 00	00 20	05 00
	Get	BE EF	03	06 00	CD D2	02 00	00 20	00 00	
Error Status	Get	Get	BE EF	03	06 00	D9 D8	02 00	20 60	00 00
		(Example return) 00 00 01 00 02 00 03 00 (Normal) (Cover error) (Fan error) (Lamp error) 04 00 05 00 06 00 07 00 (Temp error) (Air flow error) (Lamp time error) (Cool error) 08 00 (Filter error)							
BRIGHT	Get		BE EF	03	06 00	89 D2	02 00	03 20	00 00
	Increment		BE EF	03	06 00	EF D2	04 00	03 20	00 00
	Decrement		BE EF	03	06 00	3E D3	05 00	03 20	00 00
BRIGHT Reset	Execute		BE EF	03	06 00	58 D3	06 00	00 70	00 00
CONTRAST	Get		BE EF	03	06 00	FD D3	02 00	04 20	00 00
	Increment		BE EF	03	06 00	9B D3	04 00	04 20	00 00
	Decrement		BE EF	03	06 00	4A D2	05 00	04 20	00 00
CONTRAST Reset	Execute		BE EF	03	06 00	A4 D2	06 00	01 70	00 00
MODE	Set	NORMAL	BE EF	03	06 00	23 F6	01 00	BA 30	00 00
		CINEMA	BE EF	03	06 00	B3 F7	01 00	BA 30	01 00
		MUSIC	BE EF	03	06 00	43 F7	01 00	BA 30	02 00
		SPORTS	BE EF	03	06 00	D3 F6	01 00	BA 30	03 00
		DYNAMIC	BE EF	03	06 00	E3 F4	01 00	BA 30	04 00
	Get	BE EF	03	06 00	10 F6	02 00	BA 30	00 00	
		(Example return) 00 00 01 00 02 00 03 00 04 00 10 00 (Normal) (Cinema) (Music) (Sports) (Dynamic) (Custom)							
GAMMA		#1 DEFAULT	BE EF	03	06 00	07 E9	01 00	A1 30	20 00
		#1 CUSTOM	BE EF	03	06 00	07 FD	01 00	A1 30	10 00
		#2 DEFAULT	BE EF	03	06 00	97 E8	01 00	A1 30	21 00
		#2 CUSTOM	BE EF	03	06 00	97 FC	01 00	A1 30	11 00
		#3 DEFAULT	BE EF	03	06 00	67 E8	01 00	A1 30	22 00
		#3 CUSTOM	BE EF	03	06 00	67 FC	01 00	A1 30	12 00
		#4 DEFAULT	BE EF	03	06 00	F7 E9	01 00	A1 30	23 00
		#4 CUSTOM	BE EF	03	06 00	F7 FD	01 00	A1 30	13 00
	Get	BE EF	03	06 00	F4 F0	02 00	A1 30	00 00	

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Names	Operation Type	Header					Command Data		
						CRC	Action	Type	Setting Code
User Gamma Pattern	Set	Off	BE EF	03	06 00	FB FA	01 00	80 30	00 00
		9 step gray scale	BE EF	03	06 00	6B FB	01 00	80 30	01 00
		15 steps gray scale	BE EF	03	06 00	9B FB	01 00	80 30	02 00
		Ramp	BE EF	03	06 00	0B FA	01 00	80 30	03 00
	Get		BE EF	03	06 00	C8 FA	02 00	80 30	00 00
User Gamma Point 1	Get		BE EF	03	06 00	08 FE	02 00	90 30	00 00
	Increment		BE EF	03	06 00	6E FE	04 00	90 30	00 00
	Decrement		BE EF	03	06 00	BF FF	05 00	90 30	00 00
User Gamma Point 2	Get		BE EF	03	06 00	F4 FF	02 00	91 30	00 00
	Increment		BE EF	03	06 00	92 FF	04 00	91 30	00 00
	Decrement		BE EF	03	06 00	43 FE	05 00	91 30	00 00
User Gamma Point 3	Get		BE EF	03	06 00	B0 FF	02 00	92 30	00 00
	Increment		BE EF	03	06 00	D6 FF	04 00	92 30	00 00
	Decrement		BE EF	03	06 00	07 FE	05 00	92 30	00 00
User Gamma Point 4	Get		BE EF	03	06 00	4C FE	02 00	93 30	00 00
	Increment		BE EF	03	06 00	2A FE	04 00	93 30	00 00
	Decrement		BE EF	03	06 00	FB FF	05 00	93 30	00 00
User Gamma Point 5	Get		BE EF	03	06 00	38 FF	02 00	94 30	00 00
	Increment		BE EF	03	06 00	5E FF	04 00	94 30	00 00
	Decrement		BE EF	03	06 00	8F FE	05 00	94 30	00 00
User Gamma Point 6	Get		BE EF	03	06 00	C4 FE	02 00	95 30	00 00
	Increment		BE EF	03	06 00	A2 FE	04 00	95 30	00 00
	Decrement		BE EF	03	06 00	73 FF	05 00	95 30	00 00
User Gamma Point 7	Get		BE EF	03	06 00	80 FE	02 00	96 30	00 00
	Increment		BE EF	03	06 00	E6 FE	04 00	96 30	00 00
	Decrement		BE EF	03	06 00	37 FF	05 00	96 30	00 00
User Gamma Point 8	Get		BE EF	03	06 00	7C FF	02 00	97 30	00 00
	Increment		BE EF	03	06 00	1A FF	04 00	97 30	00 00
	Decrement		BE EF	03	06 00	CB FE	05 00	97 30	00 00
COLOR TEMP	Set	6500K	BE EF	03	06 00	AB C5	01 00	B0 30	41 00
		7500K	BE EF	03	06 00	0B C3	01 00	B0 30	4B 00
		8000K	BE EF	03	06 00	FB C9	01 00	B0 30	50 00
		8500K	BE EF	03	06 00	AB CA	01 00	B0 30	55 00
		9300K	BE EF	03	06 00	6B CD	01 00	B0 30	5D 00
		DYNAMIC	BE EF	03	06 00	3B F2	01 00	B0 30	08 00
		CUSTOM	BE EF	03	06 00	3B F8	01 00	B0 30	10 00
	Get		BE EF	03	06 00	C8 F5	02 00	B0 30	00 00

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Names	Operation Type		Header				Command Data		
					CRC	Action	Type	Setting Code	
COLOR TEMP GAIN R	Get		BE EF	03	06 00	34 F4	02 00	B1 30	00 00
	Increment		BE EF	03	06 00	52 F4	04 00	B1 30	00 00
	Decrement		BE EF	03	06 00	83 F5	05 00	B1 30	00 00
COLOR TEMP GAIN G	Get		BE EF	03	06 00	70 F7	02 00	B2 30	00 00
	Increment		BE EF	03	06 00	16 F7	04 00	B2 30	00 00
	Decrement		BE EF	03	06 00	C7 F5	05 00	B2 30	00 00
COLOR TEMP GAIN B	Get		BE EF	03	06 00	8C F5	02 00	B3 30	00 00
	Increment		BE EF	03	06 00	EA F5	04 00	B3 30	00 00
	Decrement		BE EF	03	06 00	3B F4	05 00	B3 30	00 00
COLOR TEMP OFFSET R	Get		BE EF	03	06 00	04 F5	02 00	B5 30	00 00
	Increment		BE EF	03	06 00	62 F5	04 00	B5 30	00 00
	Decrement		BE EF	03	06 00	B3 F4	05 00	B5 30	00 00
COLOR TEMP OFFSET G	Get		BE EF	03	06 00	40 F5	02 00	B6 30	00 00
	Increment		BE EF	03	06 00	26 F5	04 00	B6 30	00 00
	Decrement		BE EF	03	06 00	F7 F4	05 00	B6 30	00 00
COLOR TEMP OFFSET B	Get		BE EF	03	06 00	BC F4	02 00	B7 30	00 00
	Increment		BE EF	03	06 00	DA F4	04 00	B7 30	00 00
	Decrement		BE EF	03	06 00	0B F5	05 00	B7 30	00 00
COLOR	Get		BE EF	03	06 00	B5 72	02 00	02 22	00 00
	Increment		BE EF	03	06 00	D3 72	04 00	02 22	00 00
	Decrement		BE EF	03	06 00	02 73	05 00	02 22	00 00
COLOR Reset	Execute		BE EF	03	06 00	80 D0	06 00	0A 70	00 00
TINT	Get		BE EF	03	06 00	49 73	02 00	03 22	00 00
	Increment		BE EF	03	06 00	2F 73	04 00	03 22	00 00
	Decrement		BE EF	03	06 00	Fe 72	05 00	03 22	00 00
TINT Reset	Execute		BE EF	03	06 00	7C D1	06 00	0B 70	00 00
SHARPNESS	Get		BE EF	03	06 00	F1 72	02 00	01 22	00 00
	Increment		BE EF	03	06 00	97 72	04 00	01 22	00 00
	Decrement		BE EF	03	06 00	46 73	05 00	01 22	00 00
SHARPNESS Reset	Execute		BE EF	03	06 00	C4 D0	06 00	09 70	00 00
MY MEMORY Load	Set	1	BE EF	03	06 00	0E D7	01 00	14 20	00 00
		2	BE EF	03	06 00	9E D6	01 00	14 20	01 00
		3	BE EF	03	06 00	6E D6	01 00	14 20	02 00
		4	BE EF	03	06 00	FE D7	01 00	14 20	03 00
MY MEMORY Save	Set	1	BE EF	03	06 00	F2 D6	01 00	15 20	00 00
		2	BE EF	03	06 00	62 D7	01 00	15 20	01 00
		3	BE EF	03	06 00	92 D7	01 00	15 20	02 00
		4	BE EF	03	06 00	02 D6	01 00	15 20	03 00
PROGRESSIVE	Set	TURN OFF	BE EF	03	06 00	4A 72	01 00	07 22	00 00
		TV	BE EF	03	06 00	DA 73	01 00	07 22	01 00
		FILM	BE EF	03	06 00	2A 73	01 00	07 22	02 00
		Get	BE EF	03	06 00	79 72	02 00	07 22	00 00

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Names	Operation Type	Header					Command Data		
						CRC	Action	Type	Setting Code
ASPECT	Set	4:3	BE EF	03	06 00	9E D0	01 00	08 20	00 00
		16:9	BE EF	03	06 00	0E D1	01 00	08 20	01 00
		WIDE	BE EF	03	06 00	CE D3	01 00	08 20	05 00
		MOVIE1	BE EF	03	06 00	3E D3	01 00	08 20	06 00
		MOVIE2	BE EF	03	06 00	AE D2	01 00	08 20	07 00
		NORMAL	BE EF	03	06 00	5E DD	01 00	08 20	10 00
	Get		BE EF	03	06 00	AD D0	02 00	08 20	00 00
OVER SCAN	Get		BE EF	03	06 00	91 70	02 00	09 22	00 00
	Increment		BE EF	03	06 00	F7 70	04 00	09 22	00 00
	Decrement		BE EF	03	06 00	26 71	05 00	09 22	00 00
OVER SCAN Reset	Execute		BE EF	03	06 00	EC D9	06 00	27 70	00 00
V POSITION	Get		BE EF	03	06 00	0D 83	02 00	00 21	00 00
	Increment		BE EF	03	06 00	6B 83	04 00	00 21	00 00
	Decrement		BE EF	03	06 00	BA 82	05 00	00 21	00 00
V POSITION Reset	Execute		BE EF	03	06 00	E0 D2	06 00	02 70	00 00
H POSITION	Get		BE EF	03	06 00	F1 82	02 00	01 21	00 00
	Increment		BE EF	03	06 00	97 82	04 00	01 21	00 00
	Decrement		BE EF	03	06 00	46 83	05 00	01 21	00 00
H POSITION Reset	Execute		BE EF	03	06 00	1C D3	06 00	03 70	00 00
H PHASE	Get		BE EF	03	06 00	49 83	02 00	03 21	00 00
	Increment		BE EF	03	06 00	2F 83	04 00	03 21	00 00
	Decrement		BE EF	03	06 00	FE 82	05 00	03 21	00 00
H SIZE	Get		BE EF	03	06 00	B5 82	02 00	02 21	00 00
	Increment		BE EF	03	06 00	D3 82	04 00	02 21	00 00
	Decrement		BE EF	03	06 00	02 83	05 00	02 21	00 00
H SIZE Reset	Execute		BE EF	03	06 00	63 D2	06 00	04 70	00 00
AUTO ADJUST	Execute		BE EF	03	06 00	91 D0	06 00	0A 20	00 00

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Names	Operation Type		Header				Command Data		
							CRC	Action	Type
COLOR SPACE	Set	AUTO	BE EF	03	06 00	0E 72	01 00	04 22	00 00
		RGB	BE EF	03	06 00	9E 73	01 00	04 22	01 00
		SMPTE240	BE EF	03	06 00	6E 73	01 00	04 22	02 00
		REC709	BE EF	03	06 00	FE 72	01 00	04 22	03 00
		REC601	BE EF	03	06 00	CE 70	01 00	04 22	04 00
	Get		BE EF	03	06 00	3D 72	02 00	04 22	00 00
COMPONENT	Set	COMPONENT	BE EF	03	06 00	4A D7	01 00	17 20	00 00
		SCART RGB	BE EF	03	06 00	DA D6	01 00	17 20	01 00
	Get		BE EF	03	06 00	79 D7	02 00	17 20	00 00
VIDEO FORMAT	Set	AUTO	BE EF	03	06 00	9E 75	01 00	00 22	0A 00
		NTSC	BE EF	03	06 00	FE 71	01 00	00 22	04 00
		PAL	BE EF	03	06 00	6E 70	01 00	00 22	05 00
		SECAM	BE EF	03	06 00	6E 75	01 00	00 22	09 00
		NTSC4.43	BE EF	03	06 00	5E 72	01 00	00 22	02 00
		M-PAL	BE EF	03	06 00	FE 74	01 00	00 22	08 00
		N-PAL	BE EF	03	06 00	0E 71	01 00	00 22	07 00
	Get		BE EF	03	06 00	0D 73	02 00	00 22	00 00
DVI	Set	DVD	BE EF	03	06 00	3E D9	01 00	20 20	00 00
		COMPUTER	BE EF	03	06 00	AE D8	01 00	20 20	01 00
	Get		BE EF	03	06 00	0D D9	02 00	20 20	00 00
S-ASPECT	Set	TURN OFF	BE EF	03	06 00	1A 71	01 00	0B 22	00 00
		TURN ON	BE EF	03	06 00	8A 70	01 00	0B 22	01 00
	Get		BE EF	03	06 00	29 71	02 00	0B 22	00 00

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Names	Operation Type	Header				Command Data		
				CRC		Action	Type	Setting Code
KEYSTONE V	Get	BE EF	03	06 00	B9 D3	02 00	07 20	00 00
	Increment	BE EF	03	06 00	DF D3	04 00	07 20	00 00
	Decrement	BE EF	03	06 00	0E D2	05 00	07 20	00 00
KEYSTONE V Reset	Execute	BE EF	03	06 00	08 D0	06 00	0C 70	00 00
OPTICAL BLACK	Set	OFF	BE EF	03	06 00	7F 23	01 00	03 33
		NATURAL	BE EF	03	06 00	EF 22	01 00	03 33
		DEEP	BE EF	03	06 00	1F 22	01 00	03 33
	Get	BE EF	03	06 00	4C 23	02 00	03 33	00 00
		(Example return) 00 00 01 00 02 00 03 00 (Off) (Natural) (Deep) (Custom)						
WHISPER	Set	NORMAL	BE EF	03	06 00	3B 23	01 00	00 33
		WHISPER	BE EF	03	06 00	AB 22	01 00	00 33
	Get	BE EF	03	06 00	08 23	02 00	00 33	00 00
IRIS	Get	BE EF	03	06 00	B0 22	02 00	02 33	00 00
	Increment	BE EF	03	06 00	D6 22	04 00	02 33	00 00
	Decrement	BE EF	03	06 00	07 23	05 00	02 33	00 00
MIRROR	Set	NORMAL	BE EF	03	06 00	C7 D2	01 00	01 30
		H:INVERT	BE EF	03	06 00	57 D3	01 00	01 30
		V:INVERT	BE EF	03	06 00	A7 D3	01 00	01 30
		H&V:INVERT	BE EF	03	06 00	37 D2	01 00	01 30
	Get	BE EF	03	06 00	F4 D2	02 00	01 30	00 00
LANGUAGE	Set	ENGLISH	BE EF	03	06 00	F7 D3	01 00	05 30
		FRANÇAIS	BE EF	03	06 00	67 D2	01 00	05 30
		DEUTSCH	BE EF	03	06 00	97 D2	01 00	05 30
		ESPAÑOL	BE EF	03	06 00	07 D3	01 00	05 30
		ITALIANO	BE EF	03	06 00	37 D1	01 00	05 30
		NORSK	BE EF	03	06 00	A7 D0	01 00	05 30
		NEDERLANDS	BE EF	03	06 00	57 D0	01 00	05 30
		PORTUGUÊS	BE EF	03	06 00	C7 D1	01 00	05 30
		日本語	BE EF	03	06 00	37 D4	01 00	05 30
		中文	BE EF	03	06 00	A7 D5	01 00	05 30
		한글	BE EF	03	06 00	57 D5	01 00	05 30
		SVENSKA	BE EF	03	06 00	C7 D4	01 00	05 30
		РУССКИЙ	BE EF	03	06 00	F7 D6	01 00	05 30
		SUOMI	BE EF	03	06 00	67 D7	01 00	05 30
		POLSKI	BE EF	03	06 00	97 D7	01 00	05 30
	Get	BE EF	03	06 00	C4 D3	02 00	05 30	00 00
MENU POSITION H	Get	BE EF	03	06 00	04 D7	02 00	15 30	00 00
	Increment	BE EF	03	06 00	62 D7	04 00	15 30	00 00
	Decrement	BE EF	03	06 00	B3 D6	05 00	15 30	00 00
MENU POSITION H Reset	Execute	BE EF	03	06 00	DC C6	06 00	43 70	00 00
MENU POSITION V	Get	BE EF	03	06 00	40 D7	02 00	16 30	00 00
	Increment	BE EF	03	06 00	26 D7	04 00	16 30	00 00
	Decrement	BE EF	03	06 00	F7 D6	05 00	16 30	00 00
MENU POSITION V Reset	Execute	BE EF	03	06 00	A8 C7	06 00	44 70	00 00

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Names	Operation Type		Header				Command Data		
							CRC	Action	Type
OSD BRIGHT	Get		BE EF	03	06 00	A8 D5	02 00	18 30	00 00
	Increment		BE EF	03	06 00	CE D5	04 00	18 30	00 00
	Decrement		BE EF	03	06 00	1F D4	05 00	18 30	00 00
START UP	Set	My Screen	BE EF	03	06 00	CB CB	01 00	04 30	20 00
		ORIGINAL	BE EF	03	06 00	0B D2	01 00	04 30	00 00
		TURN OFF	BE EF	03	06 00	9B D3	01 00	04 30	01 00
	Get		BE EF	03	06 00	38 D2	02 00	04 30	00 00
My Screen LOCK	Set	TURN OFF	BE EF	03	06 00	3B EF	01 00	C0 30	00 00
		TURN ON	BE EF	03	06 00	AB EE	01 00	C0 30	01 00
	Get		BE EF	03	06 00	08 EF	02 00	C0 30	00 00
Message	Set	TURN OFF	BE EF	03	06 00	8F D6	01 00	17 30	00 00
		TURN ON	BE EF	03	06 00	1F D7	01 00	17 30	01 00
	Get		BE EF	03	06 00	BC D6	02 00	17 30	00 00
AUTO POWER OFF	Get		BE EF	03	06 00	08 86	02 00	10 31	00 00
	Increment		BE EF	03	06 00	6E 86	04 00	10 31	00 00
	Decrement		BE EF	03	06 00	BF 87	05 00	10 31	00 00
LAMP TIME	Get		BE EF	03	06 00	C2 FF	02 00	90 10	00 00
LAMP TIME Reset	Execute		BE EF	03	06 00	58 DC	06 00	30 70	00 00
FILTER TIME	Get		BE EF	03	06 00	C2 F0	02 00	A0 10	00 00
FILER TIME Reset	Execute		BE EF	03	06 00	98 C6	06 00	40 70	00 00