PC and projector serial communication

SM7-405

Communication Protocol

V1.1

Catalog

Brief introduction

This document is mainly to introduce projector and PC serial communication instruction, for users to complete the serial communication of projector.

1 Copyright statement

Without written permission of the company, any entity or individual shall not extract or copy part or the whole content of the document, and shall not transmit it in any way.

2 Document introduction

This document is mainly to introduce projector and PC serial communication instruction, for users to complete the serial communication of projector.

3 Document purpose

Guide users to complete the operation of projector platform serial communication

4 Document scope

This document is mainly to introduce projector and PC serial communication instruction, for users to complete the serial communication of projector.

5 Object reader

Projector serial communication users, or technical engineer

6 Projector serial communication

6.1 Projector interface specifications

Projector realizes data communication with PC through specialized VGA interface(including tx,rx,gnd),completes corresponding operation according to the Cmd of PC. The data frame of serial communication is 1 start, 8 data, 1 stop, no parity checking, baud rate 9600.In serial communication, the lowest valid byte will be transmitted firstly.

6.2 Protocol description

Communication process must be through PC sending Cmd and data to projector, and then the projector returning the Cmd execution result state and data to PC.

Cmd sending process is as follows,

PC	Data transfer direction	Projector	Description
Cmd data block	⟶		

Cmd and data which are sent from PC to projector must be comply with the format and specifications of this protocol.After sending Cmd and data to projector, and then waiting for the execution results

When projector receives Cmd from PC, executes the corresponding Cmd and then returns results. Cmd execution is as follows,

Projector	Data transfer direction	PC	Description
Response data block	⟶		

Projector executes Cmd, receives the result, and then sends response data block to PC, which is obtained from the execution of corresponding Cmd. So far, a complete communication process comes to the end.

6.3 Data block format

6.3.1 PC and projector communication format

Sending frame format,

Start	Length	MainCmd	SubCmd	Data	CheckSum
0xE0	0x05+N（Data length)	Occupying 1 byte	Occupying 1 byte	N byte	Occupying 1 byte

Start：Occupying 1 byte, fixed to be 0xE0, unchangeable.

Length：Occupying 1byte, which means total length of current communication one frame   data. Total length is 5+N

（Start、Length、MainCmd、SubCmd、CheckSum add up to 5 bytes，Data is N byte.）

MainCmd：Occupying 1 byte, being MainCmd.

SubCmd：Occupying 1byte, being subcmd.

CheckSum: Checksum.

Computing method of Checksum: Besides Checksum, all data add up for complement, namely the complementation plus 1, take the low type.

Note: Frame data does not include any punctuation.

Receiving frame format,

Length	Data	CheckSum
N+1	N byte	Occupying 1 byte

6.3.2 PC and projector communication specific Cmd

When MainCmd equals 0x41, corresponding SubCmd will be totally 3 as following,

SubCmd	Value	Description
Get current	0x01	This Cmd is to get RGB current.When projector receives the Cmd, sends PC 6 bytes.The corresponding current of R,G,B are 2 bytes, low byte first.
Set current	0x02	This Cmd is to set RGB current. When PC send this Cmd to projector, the projector receives 6 bytes RGB current and set it, low byte first. After executing the Cmd, the projector returns to "Ack"
LED ONOFF control	0x18	This Cmd is to control LED ONOFF.After executing the Cmd, the projector returns to "Ack"

6.3.3 PC and projector handshake Cmd

State	Length	MainCmd	SubCmd	CheckSum
0xE0	0x05	0x44	0x00	0Xd7

PC sends Cmd 5bytes（0xE0,0x05,0x44,0x00,0Xd7）to projector. After receiving the Cmd, the projector sends a string "shakehands"to the PC, not including "". If PC receives the string, means handshake is successful, or else, it's failed.

Returning data frame:0C 53 68 61 6B 65 48 61 6E 64 73 1A

Note: Handshake Cmd is used to test whether the serial communication line between PC and computer is normal or not, it only need to be sent once after opening the serial port.

6.3.4 MainCmd equals 0x41, corresponding SubCmd (no checksum)

1、 Get current Cmd 0x01

State	Length	MainCmd	SubCmd
0xE0	0x04	0x41	0x01

PC sends Cmd 4Bytes（0xE0,0x04,0x41,0x01）to projector, and the projector sends

6bytes RGB current value to PC after receiving the Cmd,low byte first.

Corresponding format:R_Low,R_High,G_Low,G_High,B_Low,B_High

For example：R=100，G=100，B=100，

Corresponding return data: 0x64,00,0x64,00,0x64,0x00

2、 Set current Cmd 0x02

Start	Length	MainCmd	SubCmd	Data
0xE0	0x0A	0x41	0x02	xx ,xx, xx ,xx, xx, xx

PC sends Cmd 10bytes（0xE0,0x0A,0x41,0x02, xx, xx, xx ,xx, xx, xx）to projector, after receiving the Cmd, the projector set the corresponding RGB current and return the string "Ack", not including "". RGB current which need to be set is corresponding to Data. Corresponding data format of Data: R_Low,R_High,G_Low,G_High,B_Low,B_High

For example：R=100，G=100，B=100，corresponding data:0x64,00,0x64,00,0x64,0x00

A complete frame data: 0xE0,0x0A,0x41,0x02,   0x64,00,0x64,00,0x64,0x00

Note：R=0~255,G=0~255,B=0~255

3、 LED ONOFF control Cmd 0x18

Start	Length	MainCmd	SubCmd	Data
0xE0	0x05	0x41	0x18	xx

PC sends Cmd 5bytes（0xE0,0x05,0x41,0x18,xx）to projector,after receiving the Cmd, the

projector set corresponding LED state and return the string "Ack", not including "". LED state

value which need to be set is corresponding to Data.

LED ON Cmd:0xE0,0x05,0x41,0x18,0x01   Ｒｅｔｕｒｎ:0x41,0x63,0x6B , namely Ack   LED

OFF Cmd:0xE0,0x05,0x41,0x18,0x00   Ｒｅｔｕｒｎ:0x41,0x63,0x6B , Namely Ack

6.4 Projector firmware upgrade(no checksum)

Copy projector firmware document (document name and type being unchangeable)to root directory of U disk, and then insert the Udisk to USB interface of the projector, send upgrade Cmd through serial port.

0xE0	0x03	0x38

After upgrading, the projector will automatically restart.