VX Pro Series

V1.0.3

Control Protocol

Change History

Version	Modified By	Description	Date
V1.0.3	Zhang Yi	Added the instructions for setting the screen audio source.	2025-05-30
V1.0.2	Zhang Yi	Added sections 3.6 to 3.14	2025-05-06
V1.0.1	Zhang Fan	Added sections 3.4 to 3.5.	2025-01-14
V1.0.0	Zhang Fan	Initialized the VX Pro series control protocol, supporting both TCP and RS232 protocols.	2024-12-14

Contents

1. Privacy Statement

a) This protocol is strictly confidential, and shall not be distributed outside NovaStar or uploaded to the Internet. Anyone who breaks these rules and therefore causes any loss to the company shall be investigated according to law.

b) Developers must strictly follow the instructions in this document for related development.

2. Overview

The communication protocol format of this NovaStar video processor product includes request frames and response frames. Each request packet corresponds to only one response packet so as to form a closed-loop communication. The relevant control data frames need to be added after the TCP/IP protocol frame before being sent to the device to execute the intended functions. This protocol is applicable to the VX2000 Pro, VX1000 Pro, VX600 Pro and VX400 Pro models with the device version of V1.1.1.

3. Communication Settings

3.1 Network Port and Communication Format

3.1.1 TCP Searching

The communication between the software and the device uses the standard TCP protocol.

(1) TCP port: 15200

(2) Reconnecting device and reading the device ID

Command to read ModelID of the device:

55 aa 00 00 fe 00 00 00 00 00 00 00 02 00 00 00 02 00 57 56

3.1.2 RS232 Serial Communication Protocol

RS232 serial communication protocol:

(1) Configuration

a) Baud rate: 115,200

b) Data bits: 8

c) Parity: None

d) Stop bits:1

e) Data stream: Hexadecimal data

(2) Command to read ModelID of the device:

55 aa 00 14 fe 00 00 00 00 00 00 00 00 00 02 02 02 00 6d 56

3.2 System Parameters

3.2.1 Control Screen Brightness

(1) Command to adjust screen brightness

Set the brightness value to XX:

55 aa 00 00 fe ff 01 ff ff ff 01 00 01 00 00 02 01 00 XX SUM_L SUM_H

The command data is in hexadecimal format and XX stands for the desired screen brightness value (range: 0-255). SUM_L and SUM_H constitute the checksum of this command frame, which is the sum of the underlined data and 0x5555. The calculation formula is as below.

SUM = 0x00 + 0x00 + 0xFE + 0x00+ 0x00 + 0xFF + 0xFF + 0xFF + 0x01 + 0x00 + 0x01 + 0x00 + 0x00 + 0x02 + 0x01 + 0x00 + XX + 0x5555, SUM = SUM_H << 8 + SUM_L ("SUM_L" stands for the lower 8 bits of SUM, while "SUM_H" stands for the higher 8 bits of SUM.)

The commonly used brightness command data is shown in the following table.

Brightness Value	Data
0%	55 aa 00 00 fe ff 01 ff ff ff 01 00 01 00 00 02 01 00 00 55 5a
10%	55 aa 00 00 fe ff 01 ff ff ff 01 00 01 00 00 02 01 00 19 6e 5a
20%	55 aa 00 00 fe ff 01 ff ff ff 01 00 01 00 00 02 01 00 33 88 5a
30%	55 aa 00 00 fe ff 01 ff ff ff 01 00 01 00 00 02 01 00 4c a1 5a
40%	55 aa 00 00 fe ff 01 ff ff ff 01 00 01 00 00 02 01 00 66 bb 5a
50%	55 aa 00 00 fe ff 01 ff ff ff 01 00 01 00 00 02 01 00 7f d4 5a
60%	55 aa 00 00 fe ff 01 ff ff ff 01 00 01 00 00 02 01 00 99 ee 5a
70%	55 aa 00 00 fe ff 01 ff ff ff 01 00 01 00 00 02 01 00 b2 07 5b
80%	55 aa 00 00 fe ff 01 ff ff ff 01 00 01 00 00 02 01 00 cc 21 5b
90%	55 aa 00 00 fe ff 01 ff ff ff 01 00 01 00 00 02 01 00 e5 3a 5b
100%	55 aa 00 00 fe ff 01 ff ff ff 01 00 01 00 00 02 01 00 ff 54 5b

(2) Response packet

If the response packet is in the following format, the screen brightness is successfully adjusted.

aa 55 00 00 ff fe 01 ff ff ff 01 00 01 00 00 02 00 00 54 5a

3.3 Preset

3.3.1 Load Presets

(1) Command to load a preset

Load preset XX:

55 aa 00 00 fe 00 00 00 00 00 01 00 00 01 51 13 01 00 XX SUM_L SUM_H

The command data is in hexadecimal format and XX stands for the preset number. The number range is 0x00-0x09 which represent preset 1-10. For the detailed preset numbers, see Appendix 6. SUM_L and SUM_H constitute the checksum of this command frame, which is the sum of the underlined data and 0x5555. The calculation formula is as below.

SUM = 0x00 + 0x00 + 0xfe + 0x00 + 0x00 + 0x00 + 0x00 + 0x00 + 0x01 + 0x00 + 0x00 + 0x01 + 0x51 + 0x13 + 0x01 + 0x00 + XX + 0x5555, SUM = SUM_H<<8 + SUM_L ("SUM_L" stands for the lower 8bit of SUM, while "SUM_H" stands for the higher 8bit of SUM.)

The commonly used preset loading command data is shown in the following table.

Preset Number	Data
1	55 aa 00 00 fe 00 00 00 00 00 01 00 00 01 51 13 01 00 00 ba 56
2	55 aa 00 00 fe 00 00 00 00 00 01 00 00 01 51 13 01 00 01 bb 56
3	55 aa 00 00 fe 00 00 00 00 00 01 00 00 01 51 13 01 00 02 bc 56
4	55 aa 00 00 fe 00 00 00 00 00 01 00 00 01 51 13 01 00 03 bd 56
5	55 aa 00 00 fe 00 00 00 00 00 01 00 00 01 51 13 01 00 04 be 56
6	55 aa 00 00 fe 00 00 00 00 00 01 00 00 01 51 13 01 00 05 bf 56

7	55 aa 00 00 fe 00 00 00 00 00 01 00 00 01 51 13 01 00 06 c0 56
8	55 aa 00 00 fe 00 00 00 00 00 01 00 00 01 51 13 01 00 07 c1 56
9	55 aa 00 00 fe 00 00 00 00 00 01 00 00 01 51 13 01 00 08 c2 56
10	55 aa 00 00 fe 00 00 00 00 00 01 00 00 01 51 13 01 00 09 c3 56

(2) Response packet

If the response packet is in the following format, the preset is successfully loaded.

aa 55 00 00 00 fe 00 00 00 00 01 00 00 01 51 13 00 00 b9 56

3.3.2 Delete Presets

(1) Delete preset XX:

55 AA 00 00 FE 00 00 00 00 00 01 00 04 01 51 13 01 00 XX SUM_L SUM_H

The command data is in hexadecimal format and XX stands for the preset number. The number range is 0x00-0x09 which represent preset 1-10. For the detailed preset numbers, see Appendix 6. SUM_L and SUM_H constitute the checksum of this command frame, which is the sum of the underlined data and 0x5555. The calculation formula is as below.

SUM = 0x00 + 0x00 + 0xfe + 0x00 + 0x00 + 0x00 + 0x00 + 0x00 + 0x01 + 0x00 + 0x04 + 0x01 + 0x51 + 0x13 + 0x01 + 0x00 + XX + 0x5555, SUM = SUM_H<<8 + SUM_L ("SUM_L" stands for the lower 8bit of SUM, while "SUM_H" stands for the higher 8bit of SUM.)

(2) Reference Value

Command	Data
Delete preset 1	55 AA 00 00 FE 00 00 00 00 00 01 00 04 01 51 13 01 00 01 BF 56

(3) Response packet

If the response packet is in the following format, the preset is successfully deleted.

AA 55 01 00 00 FE 00 00 00 00 01 00 04 01 51 13 BD 56

3.4 Switching Layer Source

(1) Command to switch the layer source

Switch layer source XX:

55 aa 00 3e fe 00 00 00 00 00 01 00 00 00 02 13 02 00 XX XXSUM_L SUM_H

The command data is in hexadecimal format and the first XX stands for the layer number. The number range is 0x00-0x0b which represent layer 1-12. "SUM_L" and "SUM_H" constitute the checksum of this command frame, which is the sum of the underlined data and 0x5555. The calculation formula is as below.

SUM = 0x00 + 0x00 + 0xfe + 0x00 + 0x00 + 0x00 + 0x00 + 0x00 + 0x01 + 0x00 + 0x00 + 0x02 + 0x13 + 0x02 + 0x00 + XX + XX + 0x5555, SUM = SUM_H<<8 + SUM_L("SUM_L" stands for the lower 8bit of SUM, while "SUM_H" stands for the higher 8bit of SUM.)

(2) Reference Value

Command	Data
Switch layer 1 source to HDMI 1	55 aa 00 3e fe 00 00 00 00 00 01 00 00 00 02 13 02 00 01 01 ab 56
Switch layer 1 source to HDMI 2	55 aa 00 3e fe 00 00 00 00 00 01 00 00 00 02 13 02 00 01 02 ac 56
Switch layer 1 source	55 aa 00 3e fe 00 00 00 00 00 01 00 00 00 02 13 02 00 01 03

to HDMI 3	ad 56
Switch layer 1 source to HDMI 4	55 aa 00 3e fe 00 00 00 00 00 01 00 00 00 02 13 02 00 01 04 ae 56
Switch layer 1 source to HDMI 5	55 aa 00 3e fe 00 00 00 00 00 01 00 00 00 02 13 02 00 01 05 af 56
Switch layer 1 source to HDMI 6	55 aa 00 3e fe 00 00 00 00 00 01 00 00 00 02 13 02 00 01 06 b0 56
Switch layer 1 source to HDMI 7	55 aa 00 3e fe 00 00 00 00 00 01 00 00 00 02 13 02 00 01 07 b1 56
Switch layer 1 source to DP	55 aa 00 3e fe 00 00 00 00 00 01 00 00 00 02 13 02 00 01 08 b2 56
Switch layer 1 source to SDI	55 aa 00 3e fe 00 00 00 00 00 01 00 00 00 02 13 02 00 01 09 b3 56
Switch layer 1 source to USB	55 aa 00 3e fe 00 00 00 00 00 01 00 00 00 02 13 02 00 01 0b b5 56
Switch layer 1 source to OPT1-1	55 aa 00 3e fe 00 00 00 00 00 01 00 00 00 02 13 02 00 01 0d b7 56
Switch layer 1 source to OPT1-2	55 aa 00 3e fe 00 00 00 00 00 01 00 00 00 02 13 02 00 01 0e b8 56

Command	Data
Switch layer 2 source	55 aa 00 3e fe 00 00 00 00 00 01 00 00 00 02 13 02 00 02 01

to HDMI 1	ac 56
Switch layer 2 source to HDMI 2	55 aa 00 3e fe 00 00 00 00 00 01 00 00 00 02 13 02 00 02 02 ad 56
Switch layer 2 source to HDMI 3	55 aa 00 3e fe 00 00 00 00 00 01 00 00 00 02 13 02 00 02 03 ae 56
Switch layer 2 source to HDMI 4	55 aa 00 3e fe 00 00 00 00 00 01 00 00 00 02 13 02 00 02 04 af 56
Switch layer 2 source to HDMI 5	55 aa 00 3e fe 00 00 00 00 00 01 00 00 00 02 13 02 00 02 05 b0 56
Switch layer 2 source to HDMI 6	55 aa 00 3e fe 00 00 00 00 00 01 00 00 00 02 13 02 00 02 06 b1 56
Switch layer 2 source to HDMI 7	55 aa 00 3e fe 00 00 00 00 00 01 00 00 00 02 13 02 00 02 07 b2 56
Switch layer 2 source to DP	55 aa 00 3e fe 00 00 00 00 00 01 00 00 00 02 13 02 00 02 08 b3 56
Switch layer 2 source to SDI	55 aa 00 3e fe 00 00 00 00 00 01 00 00 00 02 13 02 00 02 09 b4 56
Switch layer 2 source to USB	55 AA 00 3E FE 00 00 00 00 00 01 00 00 00 02 13 02 00 02 0B b6 56
Switch layer 2 source to OPT1-1	55 aa 00 3e fe 00 00 00 00 00 01 00 00 00 02 13 02 00 02 0d b8 56
Switch layer 2 source	55 aa 00 3e fe 00 00 00 00 00 01 00 00 00 02 13 02 00 02 0e

to OPT1-2	b9 56

3.5 USB Playback

(1) Command

55 aa 00 3e fe 00 00 00 00 00 01 00 00 00 00 14 01 00 XXSUM_L SUM_H

The command data is in hexadecimal format and XX stands for the desired playback command. SUM_L and SUM_H constitute the checksum of this command frame, which is the sum of the underlined data and 0x5555. The calculation formula is as below.

SUM = 0x00 + 0x00 + 0xfe + 0x00 + 0x00 + 0x00 + 0x00 + 0x00 + 0x01 + 0x00 + 0x00 + 0x00 + 0x14 + 0x01 + 0x00 + XX + 0x5555, SUM = SUM_H<<8 + SUM_L ("SUM_L" stands for the lower 8bit of SUM, while "SUM_H" stands for the higher 8bit of SUM.)

(2) Reference Value

Command	Data
Pause	55 aa 00 3e fe 00 00 00 00 00 01 00 00 00 00 14 01 00 00 a7 56
Play	55 aa 00 3e fe 00 00 00 00 00 01 00 00 00 00 14 01 00 01 a8 56
Stop	55 aa 00 3e fe 00 00 00 00 00 01 00 00 00 00 14 01 00 02 a9 56
Previous	55 aa 00 3e fe 00 00 00 00 00 01 00 00 00 00 14 01 00 03 aa 56
Next	55 aa 00 3e fe 00 00 00 00 00 01 00 00 00 00 14 01 00 04 ab 56

3.6 Audio

3.6.1 Enable Sound

(1) Command

55 AA 00 00 FE FF 00 00 00 00 01 00 86 00 00 02 01 00 00 DC 57

The command data is in hexadecimal format. SUM_L and SUM_H constitute the checksum of this command frame. The calculation formula is as below.

SUM = 0x00 + 0x00 + 0xFE + 0xFF + 0x00 + 0x00 + 0x00 + 0x00 + 0x01 + 0x00 + 0x86 + 0x00 + 0x00 + 0x02 + 0x01 + 0x00 + 0x00 + 0x5555, SUM = SUM_H <<8 + SUM_L

("SUM_L" stands for the lower 8bit of SUM, while "SUM_H" stands for the higher 8bit of SUM.)

(2) Response packet

If the response packet is in the following format, the sound is successfully enabled.

AA 55 00 00 FF FE 00 00 00 00 01 00 86 00 00 02 00 00 DB 57

3.6.2 Mute

(1) Command

55 AA 00 00 FE FF 00 00 00 00 01 00 86 00 00 02 01 00 58 34 58

The command data is in hexadecimal format. SUM_L and SUM_H constitute the checksum of this command frame. The calculation formula is as below.

SUM = 0x00 + 0x00 + 0xFE + 0xFF + 0x00 + 0x00 + 0x00 + 0x00 + 0x01 + 0x00 + 0x86 + 0x00 + 0x00 + 0x02 + 0x01 + 0x00 + 0x58 + 0x5555, SUM = SUM_H <<8 + SUM_L

("SUM_L" stands for the lower 8bit of SUM, while "SUM_H" stands for the higher 8bit of SUM.)

(2) Response packet

If the response packet is in the following format, the mute command is successfully

executed.

AA 55 00 00 FF FE 00 00 00 00 01 00 86 00 00 02 00 00 DB 57

3.7 Display Control

3.7.1 Enable FTB

(1) Command

55 AA 00 00 FE FF 00 00 00 00 01 00 50 00 20 02 01 00 01 C7 57

The command data is in hexadecimal format. SUM_L and SUM_H constitute the checksum of this command frame. The calculation formula is as below.

SUM = 0x00 + 0x00 + 0xFE + 0xFF + 0x00 + 0x00 + 0x00 + 0x00 + 0x01 + 0x00 + 0x50 + 0x00 + 0x20 + 0x02 + 0x01 + 0x00 + 0x02 + 0x5555, SUM = SUM_H <<8 + SUM_L

("SUM_L" stands for the lower 8bit of SUM, while "SUM_H" stands for the higher 8bit of SUM.)

(2) Response packet

If the response packet is in the following format, the FTB is successfully enabled.

AA 55 00 00 FF FE 00 00 00 00 01 00 50 00 20 02 00 00 C5 57

3.7.2 Enable Freeze

(1) Command

55 AA 00 00 FE FF 00 00 00 00 01 00 50 00 20 02 01 00 02 C8 57

The command data is in hexadecimal format. SUM_L and SUM_H constitute the checksum of this command frame. The calculation formula is as below.

SUM = 0x00 + 0x00 + 0xFE + 0xFF + 0x00 + 0x00 + 0x00 + 0x00 + 0x01 + 0x00 + 0x50 + 0x00 + 0x20 + 0x02 + 0x01 + 0x00 + 0x01 + 0x5555, SUM = SUM_H <<8 + SUM_L

("SUM_L" stands for the lower 8bit of SUM, while "SUM_H" stands for the higher 8bit of SUM.)

(2) Response packet

If the response packet is in the following format, the freeze is successfully enabled.

AA 55 00 00 FF FE 00 00 00 00 01 00 50 00 20 02 00 00 C5 57

3.7.3 Disable Freeze/FTB

(1) Command

55 AA 00 00 FE FF 00 00 00 00 01 00 50 00 20 02 01 00 00 C6 57

The command data is in hexadecimal format. SUM_L and SUM_H constitute the checksum of this command frame. The calculation formula is as below.

SUM = 0x00 + 0x00 + 0xFE + 0xFF + 0x00 + 0x00 + 0x00 + 0x00 + 0x01 + 0x00 + 0x50 + 0x00 + 0x20 + 0x02 + 0x01 + 0x00 + 0x00 + 0x5555, SUM = SUM_H <<8 + SUM_L

("SUM_L" stands for the lower 8bit of SUM, while "SUM_H" stands for the higher 8bit of SUM.)

(2) Response packet

If the response packet is in the following format, the FTB/freeze is successfully disabled.

AA 55 00 00 FF FE 00 00 00 00 01 00 50 00 20 02 00 00 C5 57

3.8 Input

3.8.1 Input Source Information

(1) Command

55 AA 00 00 FE 00 00 00 00 00 00 00 01 00 01 13 00 01 69 56

The command data is in hexadecimal format. SUM_L and SUM_H constitute the checksum of this command frame. The calculation formula is as below.

SUM = 0x00 + 0x00 + 0xFE + 0x00 + 0x00 + 0x00 + 0x00 + 0x00 + 0x00 + 0x00 + 0x01 + 0x00 + 0x01 + 0x13 + 0x00 + 0x01 + 0x5555, SUM = SUM_H <<8 + SUM_L

("SUM_L" stands for the lower 8bit of SUM, while "SUM_H" stands for the higher 8bit of SUM.)

(2) Response packet

Since the response packet of obtaining input source resolution is complex and has many parameters, the following table is used to describe the commands.

AA	55	00	00	00	FE	00	00
00	00	00	00	01	00	01	13
00	01	Reserved	Source1 Interlaced	Source1 State	Source1 Width_L	Source1 Width_H	Source1 Height_L
Source1 Height_H	Source1 FrameRate count_L	Source1 FrameRate count_H	Reserved	Reserved	Reserved	Reserved	Reserved
Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved

Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Reserved	Reserved	Reserved	Source2 Interlaced	Source2 State	Source2 Width_L	Source2 Width_H	Source2 Height_L
Source2 Height_H	Source2 FrameRate count_L	Source2 FrameRate count_H	Reserved	Reserved	Reserved	Reserved	Reserved
Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Reserved	Reserved	Reserved	Source3 Interlaced	Source3 State	Source3 Width_L	Source3 Width_H	Source3 Height_L
Source3 Height_H	Source3 FrameRate count_L	Source3 FrameRate count_H	Reserved	Reserved	Reserved	Reserved	Reserved
Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Reserved	Reserved	Reserved	Source4 Interlaced	Source4 State	Source4 Width_L	Source4 Width_H	Source4 Height_L
Source4 Height_H	Source4 FrameRate count_L	Source4 FrameRate count_H	Reserved	Reserved	Reserved	Reserved	Reserved
Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved

Reserved	Reserved	Reserved	Source5 Interlaced	Source5 State	Source5 Width_L	Source5 Width_H	Source5 Height_L
Source5 Height_H	Source5 FrameRate count_L	Source5 FrameRate count_H	Reserved	Reserved	Reserved	Reserved	Reserved
Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Reserved	Reserved	Reserved	Source6 Interlaced	Source6 State	Source6 Width_L	Source6 Width_H	Source6 Height_L
Source6 Height_H	Source6 FrameRate count_L	Source6 FrameRate count_H	Reserved	Reserved	Reserved	Reserved	Reserved
Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Reserved	Reserved	Reserved	Source7 Interlaced	Source7 State	Source7 Width_L	Source7 Width_H	Source7 Height_L
Source7 Height_H	Source7 FrameRate count_L	Source7 FrameRate count_H	Reserved	Reserved	Reserved	Reserved	Reserved
Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Reserved	Reserved	Reserved	Source8	Source8	Source8	Source8	Source8

			Interlaced	State	Width_L	Width_H	Height_L
Source8 Height_H	Source8 FrameRate count_L	Source8 FrameRate count_H	Reserved	Reserved	Reserved	Reserved	Reserved
Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Reserved	Reserved	SUM_L	SUM_H				

The command data is hexadecimal. "Interlaced" indicates whether the input source is an interlaced signal or not (0: progressive; 1: interlaced). "State" indicates the input source availability (0: The input source has no signal; 1: The input source has signal). "Width" indicates the horizontal width of resolution (Width = Width_H<<8 + Width_L). "Height" indicates the vertical height of resolution (Height = Height_H<<8 + Height_L). "Framerate count" indicates the frame rate count (unit: us; Frame rate count = Frame rate count _H<<8 + Frame rate count_L; The actual input source frame rate is calculated by the frame rate count, that is, Frame rate = 100000000 / Frame rate count; The unit of frame rate is 0.01 Hz). "SUM_L" and "SUM_H" constitute the checksum of this command frame, which is the sum of the data in red and 0x5555.

3.9 Device

3.9.1 Fan Status

(1) Command

55 AA 00 00 FE 00 00 00 00 00 00 00 02 10 00 02 09 00 70 56

The command data is in hexadecimal format. SUM_L and SUM_H constitute the checksum of this command frame. The calculation formula is as below.

SUM = 0x00 + 0x00 + 0xFE + 0x00 + 0x00 + 0x00 + 0x00 + 0x00 + 0x00 + 0x00 + 0x02 + 0x10 + 0x00 + 0x02 + 0x09 + 0x00 + 0x5555, SUM = SUM_H <<8 + SUM_L

("SUM_L" stands for the lower 8bit of SUM, while "SUM_H" stands for the higher 8bit of SUM.)

(2) Response packet

AA 55 00 00 00 FE 00 00 00 00 00 00 02 10 00 02 09 00 FanState_1 FanSpeed_1_L FanSpeed_1_H FanState_2 FanSpeed_2_L FanSpeed_2_H FanState_3 FanSpeed_3_L Fan1Speed_3_H SUM_L SUM_H

The command data is in hexadecimal format and XX stands for the fan status and speed. SUM_L and SUM_H constitute the checksum of this command frame. The calculation formula is as below.

SUM = 0x00 + 0x00 + 0x00 + 0xFE + 0x00 + 0x00 + 0x00 + 0x00 + 0x00 + 0x00 + FanState_1 + FanSpeed_1_L + Fan1Speed_1_H + FanState_2 + FanSpeed_2_L + FanSpeed_2_H + FanState_3 + FanSpeed_3_L + FanSpeed_3_H + 0x5555, SUM = SUM_H<<8 + SUM_L ("SUM_L" stands for the lower 8bit of SUM, while "SUM_H" stands for the higher 8bit of SUM.)

The following is an example of a response packet:

AA 55 00 00 00 FE 00 00 00 00 00 00 02 10 00 02 09 00 01 C4 06 01 A5 06 00 00 00 E7 57

3.10 Ethernet port

3.10.1 Backup Status

(1) Command

55 AA 00 00 FE 00 00 00 00 00 00 00 Addr0 Addr1 Addr2 Addr3 Len_L Len_H SUM_L SUM_H

The commonly used command data for Ethernet port backup is shown in the following table.

Ethernet Port Backup	Data
Ethernet Port 1-4 Backup	55 AA 00 00 FE 00 00 00 00 00 00 00 18 00 00 02 04 00 71 56
Ethernet Port 5-8 Backup	55 AA 00 00 FE 00 00 00 00 00 00 00 98 00 00 02 04 00 F1 56
Ethernet Port 9-16 Backup	55 AA 00 00 FE 00 00 00 00 00 00 00 01 00 02 08 00 5E 56
Ethernet Port 17-20 Backup	55 AA 00 00 FE 00 00 00 00 00 00 00 40 00 01 02 04 00 9A 56

The command data is in hexadecimal format. SUM_L and SUM_H constitute the checksum of this command frame. The calculation formula is as below.

SUM = 0x00 + 0x00 + 0xFE + 0x00 + 0x00 + 0x00 + 0x00 + 0x00 + 0x00 + 0x00 + Addr0 + Addr1 + Addr2 + Addr3 + Len_L + Len_H + 0x5555, SUM = SUM_H <<8 + SUM_L ("SUM_L" stands for the lower 8bit of SUM, while "SUM_H" stands for the higher 8bit of SUM.)

(2) Response packet

The response packet data for Ethernet port backup is shown in the following table.

Ethernet Port Backup	Response Packet Data
Ethernet Port 1-4 Backup	AA 55 00 00 00 FE 00 00 00 00 00 00 18 00 00 02 04 00 00 00 00 00 71 56
Ethernet Port 5-8 Backup	AA 55 00 00 00 FE 00 00 00 00 00 00 98 00 00 02 04 00 00 00 00 00 F1 56
Ethernet Port 9-16 Backup	AA 55 00 00 00 FE 00 00 00 00 00 00 00 01 00 02 08 00 00 00 00 00 00 00 00 5E 56
Ethernet Port 17-20 Backup	AA 55 00 00 00 FE 00 00 00 00 00 00 40 00 01 02 04 00 00 00 00 00 9A 56

The response packet data is in hexadecimal format and XX stands for the Ethernet port backup status. One XX indicates the status of an Ethernet port. 00 indicates the Ethernet port status is primary, while 01 indicates the Ethernet port status is backup.

SUM_L and SUM_H constitute the checksum of this command frame. The calculation formula is as below.

SUM = 0x00 + 0x00 + 0x00 + 0xFE + 0x00 + 0x00 + 0x00 + 0x00 + 0x00 + 0x00 + Addr0 + Addr1 + Addr2 + Addr3 + Len_L + Len_H + XX1 + XX2 + XX3 + ... + XXN + 0x5555, SUM = SUM_H <<8 + SUM_L ("SUM_L" stands for the lower 8bit of SUM, while "SUM_H" stands for the higher 8bit of SUM.)

3.11 Layer Switch/Move

3.11.1 Layer Switch

(1) Command to open or close the layer

Open layer XX:

55 aa 00 00 fe 00 00 00 00 00 01 00 10 00 02 13 02 00 XX XXSUM_L SUM_H

The command data is in hexadecimal format. The first XX stands for the layer number. The number range is 0x00-0x0b which represent layer 1-12. The second XX stands for the layer switch status. The range is 0x00 and 0x01 where 0x00 represents close and 0x01 represents open). SUM_L and SUM_H constitute the checksum of this command frame, which is the sum of the underlined data and 0x5555. The calculation formula is as below.

SUM = 0x00 + 0x00 + 0xfe + 0x00 + 0x00 + 0x00 + 0x00 + 0x00 + 0x01 + 0x00 + 0x10 + 0x00 + 0x02 + 0x13 + 0x02 + 0x00 + XX + XX + 0x5555, SUM = SUM_H<<8 + SUM_L

("SUM_L" stands for the lower 8bit of SUM, while "SUM_H" stands for the higher 8bit of SUM.)

(2) Reference Value

Command	Data
Open Layer 1	55 AA 00 00 FE 00 00 00 00 00 01 00 10 00 02 13 02 00 01 01 7D 56
Close Layer 1	55 AA 00 00 FE 00 00 00 00 00 01 00 10 00 02 13 02 00 01 00 7C 56

(3) Response packet for opening layer 1

If the response packet is in the following format, layer 1 is successfully opened.

AA 55 01 00 00 FE 00 00 00 00 01 00 10 00 02 13 79 56

3.11.2 Layer Move

(1) Command to move the layer

Adjust layer 1 position

55 AA 00 00 FE 00 00 00 00 00 01 00 15 00 02 13 11 00 xx xx xx xx xx yy yy yy yy hh hh hh hh ww ww ww ww SUM_L SUM_H

The command data is in hexadecimal format. The first XX stands for the layer number. The number range is 0x00-0x0b which represent layer 1-12. The second to fifth XX stand for the X position of the layer; the first to fourth yy stand for the Y position of the layer; the first to fourth hh stand for the width of the layer; the first to fourth ww stand for the height of the layer. SUM_L and SUM_H constitute the checksum of this command frame, which is the sum of the underlined data and 0x5555. The calculation formula is as below.

SUM = 0x00 + 0x00 + 0xfe + 0x00 + 0x00 + 0x00 + 0x00 + 0x00 + 0x01 + 0x00 + 0x15 + 0x00 + 0x02 + 0x13 + 0x11 + 0x00 + XX + XX+ XX + XX+ XX + YY+ YY+ YY+ YY+ hh + hh + hh + hh + ww + ww + ww + ww + 0x5555, SUM = SUM_H<<8 + SUM_L ("SUM_L" stands for the lower 8bit of SUM, while "SUM_H" stands for the higher 8bit of SUM.)

(2) Reference Value

Command	Data
Move layer 1 to x:100 and y:100, with a size of 500 (width) x 500 (height)	55 AA 00 00 FE 00 00 00 00 00 01 00 15 00 02 13 11 00 01 64 00 00 00 64 00 00 00 F4 01 00 00 F4 01 00 00 42 59

(3) Response packet

If the response packet is in the following format, layer 1 is successfully moved.

AA 55 01 00 00 FE 00 00 00 00 01 00 15 00 02 13 7E 56

3.12 Factory Reset

3.12.1 Factory reset

(1) Command

55 AA 00 00 FE 00 00 00 00 00 01 00 02 00 00 01 01 00 XX SUM_L SUM_H

The command data is in hexadecimal format and the first XX stands for whether to retain IP. The range is 0x00 and 0x01 which represent retaining IP and not retaining IP respectively. SUM_L and SUM_H constitute the checksum of this command frame, which is the sum of the underlined data and 0x5555. The calculation formula is as below.

SUM = 0x00 + 0x00 + 0xfe + 0x00 + 0x00 + 0x00 + 0x00 + 0x00 + 0x01 + 0x00 + 0x02 + 0x00 + 0x00 + 0x01 + 0x01 + 0x00 + XX + 0x5555, SUM = SUM_H<<8 + SUM_L ("SUM_L" stands for the lower 8bit of SUM, while "SUM_H" stands for the higher 8bit of SUM.)

(2) Reference Value

Command	Data
Factory reset without retaining IP	55 AA 00 00 FE 00 00 00 00 00 01 00 02 00 00 01 01 00 01 59 56

(3) Response packet

If the response packet is in the following format, the device is successfully reset to factory settings.

AA 55 01 00 00 FE 00 00 00 00 01 00 10 00 02 13 79 56

3.13 Audio

3.13.1 Screen Audio

(1) Set screen audio

55 AA 00 00 FE 00 00 00 00 00 01 00 01 10 00 02 01 00 XX SUM_L SUM_H

The command data is in hexadecimal format and the first XX stands for the audio volume. The range is 0x00-0x64. SUM_L and SUM_H constitute the checksum of this command frame, which is the sum of the underlined data and 0x5555. The calculation formula is as below.

SUM = 0x00 + 0x00 + 0xfe + 0x00 + 0x00 + 0x00 + 0x00 + 0x00 + 0x01 + 0x00 + 0x01 + 0x10 + 0x00 + 0x02 + 0x01 + 0x00 + XX + 0x5555, SUM = SUM_H<<8 + SUM_L("SUM_L" stands for the lower 8bit of SUM, while "SUM_H" stands for the higher 8bit of SUM.)

(2) Reference Value

Command	Data
Set screen audio volume to 50	55 AA 00 00 FE 00 00 00 00 00 01 00 01 10 00 02 01 00 32 9A 56

(3) Response packet

If the response packet is in the following format, the screen audio volume is successfully set.

AA 55 01 00 00 FE 00 00 00 00 01 00 01 10 00 02 67 56

3.13.2 Screen Audio Sources

(1) Command to set the screen audio source

55 AA 00 00 FE 00 00 00 00 00 01 00 9E 00 00 13 01 00 XX SUM_L SUM_H

The command data is in hexadecimal format and the first XX stands for the audio source. The range is 0x00-0x64. SUM_L and SUM_H constitute the checksum of this command frame, which is the sum of the underlined data and 0x5555. The calculation formula is as below.

SUM = 0x00 + 0x00 + 0xfe + 0x00 + 0x00 + 0x00 + 0x00 + 0x00 + 0x01 + 0x00 + 0x01 + 0x10 + 0x00 + 0x02 + 0x01 + 0x00 + XX + 0x5555, SUM = SUM_H<<8 + SUM_L ("SUM_L" stands for the lower 8bit of SUM, while "SUM_H" stands for the higher 8bit of SUM.)

(2) Reference Value

Command	Data
Set screen audio source to HDMI 1	55 AA 00 00 FE 00 00 00 00 00 01 00 9E 00 00 13 01 00 01 07 57
Set screen audio source to HDMI 2	55 AA 00 00 FE 00 00 00 00 00 01 00 9E 00 00 13 01 00 02 08 57
Set screen audio source to HDMI 3	55 AA 00 00 FE 00 00 00 00 00 01 00 9E 00 00 13 01 00 03 09 57
Set screen audio source to HDMI 4	55 AA 00 00 FE 00 00 00 00 00 01 00 9E 00 00 13 01 00 04 0A 57
Set screen audio	55 AA 00 00 FE 00 00 00 00 00 01 00 9E 00 00 13 01 00 05 0B 57

source to HDMI 5	
Set screen audio source to HDMI 6	55 AA 00 00 FE 00 00 00 00 00 01 00 9E 00 00 13 01 00 06 0C 57
Set screen audio source to HDMI 7	55 AA 00 00 FE 00 00 00 00 00 01 00 9E 00 00 13 01 00 07 0D 57
Set screen audio source to DP	55 AA 00 00 FE 00 00 00 00 00 01 00 9E 00 00 13 01 00 08 0E 57
Set screen audio source to USB source	55 AA 00 00 FE 00 00 00 00 00 01 00 9E 00 00 13 01 00 09 0F 57
Set screen audio source to analog audio	55 AA 00 00 FE 00 00 00 00 00 01 00 9E 00 00 13 01 00 0A 10 57
Set screen audio source to layer 1	55 AA 00 00 FE 00 00 00 00 00 01 00 9E 00 00 13 01 00 0B 11 57
Set screen audio source to layer 2	55 AA 00 00 FE 00 00 00 00 00 01 00 9E 00 00 13 01 00 0C 12 57
Set screen audio source to layer 3	55 AA 00 00 FE 00 00 00 00 00 01 00 9E 00 00 13 01 00 0D 13 57
Set screen audio source to layer 4	55 AA 00 00 FE 00 00 00 00 00 01 00 9E 00 00 13 01 00 0E 14 57
Set screen audio	55 AA 00 00 FE 00 00 00 00 00 01 00 9E 00 00 13 01 00 0F 15 57

source to layer 5	
Set screen audio source to layer 6	55 AA 00 00 FE 00 00 00 00 00 01 00 9E 00 00 13 01 00 10 16 57
Set screen audio source to layer 7	55 AA 00 00 FE 00 00 00 00 00 01 00 9E 00 00 13 01 00 11 17 57
Set screen audio source to layer 8	55 AA 00 00 FE 00 00 00 00 00 01 00 9E 00 00 13 01 00 12 18 57
Set screen audio source to layer 9	55 AA 00 00 FE 00 00 00 00 00 01 00 9E 00 00 13 01 00 13 19 57
Set screen audio source to layer 10	55 AA 00 00 FE 00 00 00 00 00 01 00 9E 00 00 13 01 00 14 1A 57
Set screen audio source to layer 11	55 AA 00 00 FE 00 00 00 00 00 01 00 9E 00 00 13 01 00 15 1B 57
Set screen audio source to layer 12	55 AA 00 00 FE 00 00 00 00 00 01 00 9E 00 00 13 01 00 16 1C 57

(3) Response packet

If the response packet is in the following format, the screen audio source is successfully set.

AA 55 00 00 00 FE 00 00 00 00 01 00 9E 00 00 13 00 00 05 57

3.14 Obtain Light Sensor Brightness

3.14.1 Obtain Light Sensor Brightness

(1) Command to obtain the light sensor brightness

55 AA 00 00 FE 00 00 00 00 00 00 00 0F 00 00 02 02 00 66 56

The command data is in hexadecimal format.

(2) Reference Value

Command	Data
Obtain light sensor brightness	55 AA 00 00 FE 00 00 00 00 00 00 00 0F 00 00 02 02 00 66 56

(3) Response packet

If the response packet is in the following format

55 AA 00 00 FE 00 00 00 00 00 00 00 0F 00 00 02 02 00 XX XX SUM_L SUM_H

The command data is in hexadecimal format and the two XX stand for the brightness sensor brightness. The range is 0x00-0x64. SUM_L and SUM_H constitute the checksum of this command frame, which is the sum of the underlined data and 0x5555. The calculation formula is as below.

SUM = 0x00 + 0x00 + 0xfe + 0x00 + 0x00 + 0x00 + 0x00 + 0x00 + 0x00 + 0x00 + 0x0F + 0x00 + 0x00 + 0x02 + 0x02 + 0x00 + XX + 0x5555, SUM = SUM_H<<8 + SUM_L ("SUM_L" stands for the lower 8bit of SUM, while "SUM_H" stands for the higher 8bit of SUM.)