Technical Reference

020-001940-01

E510 LED Display Controller

Serial Commands

CHRISTIE

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Content

Introduction

This document provides information and procedures for using serial commands (ASCII text messages) to control the product.

RS232 communication parameters

The RS232 IN port has several communication parameters.

Parameter	Value
Default baud rate	—
Parity	None
Data bits	8
Stop bits	1
Flow control	—

Connecting to the RS232 port

Use an RS232 connection to remotely access display controls and image setups, issue commands or queries, and receive replies.

1. Connect one end of a null standard 9-pin female to female modem cable to the projectorRS232 port.
2. Connect the other end of the null standard 9-pin female to female modem cable to a computer.

Setting up terminal programs

Configure the settings for your terminal programs for proper echoing.

1. For TeraTerm, select Setup > Terminal and set the following:
    - Local echo: Checked
    - Transmit: CR+LF
2. For HyperTerm, select Select File > Properties > ASCII setup and set the following:
    - Send line ends with line feeds: Checked
    - Echo typed characters locally: Checked

Data package formats for commands

Learn the format for request and acknowledge data packages.

Request data package

The following provides information about the request data package.

Byte definition

#	Byte counts	Length (byte)	Content			
1	2	—	Head			
2	1	—	ACK			
3	1	—	Serial number			
4	1	—	Source address			
5	1	—	Destination address			
6	—	1	Device type			
7	—	1	Port address			
8	—	2	Board address [7:0]	Board address [15:8]		
9	—	1	Code			
10	—	1	Reserved			
11	—	4	Register unit address [7:0]	Register unit address [15:8]	Register unit address [23:16]	Register unit address [31:24]
12	—	2	Valid data length [7:0]	Valid data length [15:8]		
13	—	N	Write data [0:N]			
14	—	2	Checkout [7:0]	Checkout [15:8]		

Notation

#	Content	Meaning		Remark
1	Head	Data package head		55H, AAH
2	ACK	Not used for the Request command.		00H
3	Serial number	Serial number of a command. Do not use again until the command with this serial number has finished.		—
4	Source Address	Address of the computer or sending card that generates and starts the command.		The computer address is set to FEH.
5	Destination address	Address of the computer or sending card the command is to be sent to. The computer address is set to FEH. The first device connected to the COM port with COM port properties has the address of 0, the second device has the address of 1, and so on.		Devices connected in a daisychain to a computer serial port must be the same type.
6	Device type	00H	Devices with control port properties, such as sending cards, TV cards.	—
		01H	Receiving card	

7	Port address	RJ45 output port address of the sending card. SDI output port address set as 00.		[0,1,2,3]
8	Board address [7:0]	Low 8 bits of the address of a device connected in daisychain on a CAT5 data cable or SDI cable.		The first device connected on the cable has the address of 0, the second device has the address of 1, and so on. Note: Different types of devices are assigned the address respectively.
	Board address [15:8]	High 8 bits of the address of a device connected in daisychain on a CAT5 data cable or SDI cable.		
9	Code	00H	Read data package (command)	Both read and write are defined by the device that starts the command.
		01H	Write data package (command)	
		02H-FFH	Reserved	
10	Reserved	Reserved		—
11	Register unit address [7:0]	The first byte (low) of the address of the register unit on a device.		The registered unit address is four bytes long. Low at the front and high at the end.
	Register unit address [15:8]	The second byte of the address of the register unit on a device.		
	Register unit address [23:16]	The third byte of the address of the register unit on a device.		
	Register unit address [31:24]	The fourth byte (high) of the address of the register unit on a device.		
12	Valid data length [7:0]	Low 8 bits of the length of valid data.		• Code is 01H—Length of the data to be written to the destination device. • Code is 00H—Length of the data to be read from the destination device.
	Valid data length [15:8]	High 8 bits of the length of valid data.		
13	Write data [0:N]	Data to be written to the destination device. The length N is given by Valid Data Length.		• Code is 01H—Section the data is written to. • Code is 00H—Section does not exist.
14	Checkout [7:0]	Low 8 bits of the checksum.		The sum of all data in byte except the packet head and then plus 0x5555.
	Checkout [15:8]	High 8 bits of the checksum.		

Example

The following is an example of a valid data package command:

Note the following:

- The numbers under the command correspond to the table above.
- Number 13 does not exist because the Code is 0 and the write data does not exist.
- Checksum = 32 + FE + 01 + 0A + 01 + 5555 = 5961, so checkout[7:0]=61, checkout[15:8]=59

Acknowledge data package

Byte definition

#	Byte counts	Length (byte)	Content			
1	2	—	Head			
2	1	—	ACK			
3	1	—	Serial number			
4	1	—	Source address			
5	1	—	Destination address			
6	—	1	Device type			
7	—	1	Port address			
8	—	2	Board address [7:0]	Board address [15:8]		
9	—	1	Code			
10	—	1	Reserved			
11	—	4	Register unit address [7:0]	Register unit address [15:8]	Register unit address [23:16]	Register unit address [31:24]
12	—	2	Valid data length [7:0]	Valid data length [15:8]		
13	—	N	Write data [0:N]			
14	—	2	Checkout [7:0]	Checkout [15:8]		

Notation

#	Content	Meaning		Remark
1	Head	Data package head		55H, AAH
2	ACK	00H	Command succeeded.	Different ACK values indicates different result.
		01H	Command failed due to time out trying to access devices connected to a sending card.	
		02H	Command failed due to check error on request data package.	
		03H	Command failed due to check error on acknowledge data package.	
		04H	Command failed due to invalid command.	
		05H	Reserved	
		06H-FFH	Reserved	

3	Serial number	Serial number of a command. Do not use again until the command with this serial number has finished.		—
4	Source Address	Address of the computer or sending card that generates and starts the command.		The computer address is set to FEH.
5	Destination address	Address of the computer or sending card the command is to be sent to. The computer address is set to FEH. The first device connected to the COM port with COM port properties has the address of 0, the second device has the address of 1, and so on.		Devices connected in a daisychain to a computer serial port must be the same type.
6	Device type	00H	Devices with control port properties, like sending cards, TV cards.	—
		01H	Receiving card	
		02H	Function card	
7	Port address	RJ45 output port address of the sending card. SDI output port address set as 00.		[0,1,2,3]
8	Board address [7:0]	Low 8 bits of the address of a device connected in daisychain on a CAT5 data cable or SDI cable.		The first device connected on the cable has the address of 0, the second device has the address of 1, and so on. Note: Different types of devices are assigned the address respectively.
	Board address [15:8]	High 8 bits of the address of a device connected in daisychain on a CAT5 data cable or SDI cable.		
9	Code	00H	Read data package (command)	Both read and write are defined by the device that starts the command.
		01H	Write data package (command)	
		02H-FFH	Reserved	
10	Reserved	Reserved		—
11	Register unit address [7:0]	The first byte (low) of the address of the register unit on a device.		The registered unit address is four bytes long. Low at the front and high at the end.
	Register unit address [15:8]	The second byte of the address of the register unit on a device.		
	Register unit address [23:16]	The third byte of the address of the register unit on a device.		
	Register unit address [31:24]	The fourth byte (high) of the address of the register unit on a device.		
12	Valid data length [7:0]	Low 8 bits of the length of valid data.		• Code is 00H—Length of the data to be written to the destination device. • Code is 01H—Zero.
	Valid data length [15:8]	High 8 bits of the length of valid data.		
13	Write data [0:N]	Data to be written to the destination device. The length N is given by Valid Data Length.		• Code is 00H—Section the data is written to. • Code is 01H—Section does not exist.
14	Checkout [7:0]	Low 8 bits of the checksum.		

	Checkout [15:8]	High 8 bits of the checksum.	The sum of all data in bytes except the packet head and plus 0x5555.

Example

The following is an example of a data package received from the Com port:

AA 55 00 5D 00 FE 00 00 00 00 01 00 10 00 00 05 00 00 C6 56 0D 0A

1 2 3 4 5 6 7 8 9 10 11 12 14

Note the following:

- The numbers under the command correspond to the table above.
- Number 13 does not exist because the Code is 01 and the write data does not exist.
- Checksum = 5D + FE + 01 +10 + 05 + 5555 = 56C6, so checkout[7:0]=C6,checkout[15:8]=56

Serial API commands

Use the E510 LED Display Controller commands to modify product settings.

Set the display to black

Change the display to black to simulate a power off command.

Set the display to black. Request command: 55 AA 00 80 FE 00 01 00 FF FF 01 00 00 01 00 02 01 00 FF D6 59 0D 0A
Set the back to normal. Request command: 55 AA 00 80 FE 00 01 00 FF FF 01 00 00 01 00 02 01 00 00 D7 58 0D 0A

Monitoring data

Monitor card or smart module may be required for some of the data.

The data is only valid when a monitor card or smart module is connected to the control system. When the data is retrieved, the first step is to check whether the monitor card or smart module exists by analyzing data at 0x000020.

If the monitor card or smart module does not exist, do not acquire the monitoring data.

Parameters

- Device: Receiving card
- Base address: 0a000000 H
- Data length: 100HAll

All values are read-only.

Commands

Offset	Name	Description	Values
0x000000	TempValidOfScanCard	Temperature of the receiving card.	Highest bit indicates valid temperature data: • 0—Invalid data • 1—Valid data Lowest bit is for negative or positive temperature: • 0—Positive • 1—Negative
0x000001	TempOfScanCard	Temperature output of the sensor on the receiving card, in Celsius.	—

0x000002	HumiOfScanCard	Humidity measured by sensor on the receiving card. Note: No humidity sensor on all receiving card at this moment.	Highest bit is for data validation. • 0—Invalid data • 1—Valid data • 2 to 7—Humidity value Range: 0 to 100 %RH
0x000003	VoltageOfScanCard	Power supply voltage of the receiving card.	The highest bit is for data validation. • 0—Invalid data • 1—Valid data • 2 to 7—Voltage value Range: 0 to 127 V
0x000004 ... 0x00001f	Reserved	Reserved	—
0x000020	AttachedMonitorCardExist	Indicates whether the monitor card exists.	• 0xff—Monitor card is present • Any other value—Monitor card is not present
0x000021 0x000022	AttachedMonitorCardModle	Module information of the monitor card.	—
0x000023 0x000024 0x000025 0x000026	AttachedMonitorCardProgramVersion	Firmware version of the monitor card.	—
0x000027	TempValidOfMonitorCard	Temperature sensor on the monitor card.	Highest bit is for datavalidation. • 0—Invalid data • 1—Valid data • 2 to 7—Humidity value Lowest bit is for negative or positive temperature. • 0—Positive • 1—Negative
0x000028	Reserved	Reserved	
0x000029	HumiOfMonitorCard	The humidity measured by the sensor on the monitor card.	Highest bit is for data validation. • 0—Invalid data • 1—Valid data • 2 to 7—Humidity value Range: 0 to 100 %RH
0x00002a	—	The smoke sensor on the monitor card.	Lowest bit indicates whether smoke is detected. • 0—No smoke detected • 1—Smoke detected
0x00002b	FanSpeed0OfMonitorCard	The speed of Fan 1 as monitored by the monitor card.	Highest bit is for data validation. • 0—Invalid data • 1—Valid data

			• 2 to 7—Speed Range: 0 to 127 RPM
0x00002c	FanSpeed1OfMonitorCard	The speed of Fan 2 as monitored by the monitor card.	Highest bit is for data validation. • 0—Invalid data • 1—Valid data • 2 to 7—Speed Range: 0 to 127 RPM
0x00002d	FanSpeed2OfMonitorCard	The speed of Fan 3 as monitored by the monitor card.	Highest bit is for data validation. • 0—Invalid data • 1—Valid data • 2 to 7—Speed Range: 0 to 127 RPM
0x00002e	FanSpeed3OfMonitorCard	The speed of Fan 4 as monitored by the monitor card.	Highest bit is for data validation. • 0—Invalid data • 1—Valid data • 2 to 7—Speed Range: 0 to 127 RPM
0x00002f	Voltage0OfMonitorCard	The voltage of power supply 1 as monitored by the monitor card.	Highest bit is for data validation. • 0—Invalid data • 1—Valid data • 2 to 7—Voltage value Range: 0 to 127 V
0x000030	Voltage1OfMonitorCard	The voltage of power supply 2 as monitored by the monitor card.	Highest bit is for data validation. • 0—Invalid data • 1—Valid data • 2 to 7—Voltage value Range: 0 to 127 V
0x000031	Voltage2OfMonitorCard	The voltage of power supply 1 as monitored by the monitor card.	Highest bit is for data validation. • 0—Invalid data • 1—Valid data • 2 to 7—Voltage value Range: 0 to 127 V
0x000032	Voltage3OfMonitorCard	The voltage of power supply 2 as monitored by the monitor card.	Highest bit is for data validation. • 0—Invalid data • 1—Valid data • 2 to 7—Voltage value Range: 0 to 127 V

0x000033	Voltage4OfMonitorCard	The voltage of power supply 3 as monitored by the monitor card.	Highest bit is for data validation. • 0—Invalid data • 1—Valid data • 2 to 7—Voltage value Range: 0 to 127 V
0x000034	Voltage5OfMonitorCard	The voltage of power supply 4 as monitored by the monitor card.	Highest bit is for data validation. • 0—Invalid data • 1—Valid data • 2 to 7—Voltage value Range: 0 to 127 V
0x000035	Voltage6OfMonitorCard	The voltage of power supply 5 as monitored by the monitor card.	Highest bit is for data validation. • 0—Invalid data • 1—Valid data • 2 to 7—Voltage value Range: 0 to 127 V
0x000036	Voltage7OfMonitorCard	The voltage of power supply 6 as monitored by the monitor card.	Highest bit is for data validation. • 0—Invalid data • 1—Valid data • 2 to 7—Voltage value Range: 0 to 127 V
0x000037	Voltage8OfMonitorCard	The voltage of power supply 7 as monitored by the monitor card.	Highest bit is for data validation. • 0—Invalid data • 1—Valid data • 2 to 7—Voltage value Range: 0 to 127 V
0x000038 ... 0x000040	Reserved	Reserved	—
0x000041	GeneralStatusOfMonitorCard	Reports whether the cabinet doors are open.	Bit0—First cabinet Bit1—Second cabinet • 0—Closed • 1—Open
0x000042 ... 0x0000ff	Reserved	Reserved	—

Examples

Acquire monitoring data for the first receiving card. Request command: 55 AA 00 32 FE 00 01 00 00 00 00 00 00 00 00 0A 00 01 91 56 0D 0A Acknowledge data package: AA 55 00 32 00 FE 01 00 00 00 00 00 00 00 00 0A 00 01 80 36 00 B1 00 00 00 00 00 00 00 08 01 04 04 05 00 10 32 54 76 00 00 00 00 E4 00 00 00 00 00 00 FF 01 00 04 00 00 00 00 00 B2 80 80 80 80 80 B1 80 80 80 80 80 80 80 80 00 00 00 00 00 00 00 00 00 03 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 D8 72
Acquire temperature data for the first receiving card. Request command: 55 AA 00 32 FE 00 01 00 00 00 00 00 00 00 00 0A 02 00 92 56 0D 0A Acknowledge data package: AA 55 00 32 00 FE 01 00 00 00 00 00 00 00 00 0A 02 00 80 56 68 57 • 80—The data is valid • 56—The temperature is 43°C
Acquire voltage data for the first receiving card. Request command: 55 AA 00 32 FE 00 01 00 00 00 00 00 03 00 00 0A 01 00 94 56 0D 0A Acknowledge data package: AA 55 00 32 00 FE 01 00 00 00 00 00 03 00 00 0A 01 00 A9 3D 57 • A9—MSB is 1, meaning the data is valid; the low seven bit value is 29, meaning the voltage is 4.1 V

Source signal state

Identify whether the signal is being received.

Parameters

- Device: Sending card
- Base address: 02000000 H
- Data length: 8H

Commands

Offset	Attribute	Description	Values
004D	Read/Write	1bit shows the signal state 1'b0—no signal 1'b1—signal exists.	• bit[0]:SDI • bit[1]:HDMI • bit[2]:DVI Other bits are reserved.

Examples

Read the source signal state request command.

Request command:
55 AA 00 E1 FE 00 00 00 00 00 00 00 4D 00 00 02 01 00 83 57 0D 0A

Acknowledge data package :
AA 55 00 E0 00 FE 00 00 00 00 00 00 4D 00 00 02 01 00 02 85 57

- 01—SDI source signal is effective
- 02—HDMI source signal is effective
- 04—DVI source signal is effective

Setting the video source input

Review and change the input video source.

Parameters

- Device: Sending card
- Base address: 02200000 H
- Data length: 8H

Commands

Offset	Name	Attribute	Description	Values
004D	Input video source	Read/Write	Read—Displays the current input video source. Write—Switches the input video source.	• 0x1A:SDI • 0x1B:HDMI • 0x1C:DVI

Power supply control (Ethernet mode)

Turn the power supply switch on and off.

Parameters

- Device: Function card
- Base address: 05000000 H

- Data length: 1HAll

Values are read/write.

Commands

Offset	Name	Description	Values
0x000010H	PowerPortCtrl1	Status of the first power supply switch.	0—On 1—Off
0x000011H	PowerPortCtrl2	Status of the second power supply switch.	0—On 1—Off
0x000012H	PowerPortCtrl3	Status of the third power supply switch.	0—On 1—Off
0x000013H	PowerPortCtrl4	Status of the fourth power supply switch.	0—On 1—Off
0x000014H	PowerPortCtrl5	Status of the fifth power supply switch.	0—On 1—Off
0x000015H	PowerPortCtrl6	Status of the sixth power supply switch.	0—On 1—Off
0x000016H	PowerPortCtrl7	Status of the seventh power supply switch.	0—On 1—Off
0x000017H	PowerPortCtrl8	Status of the eighth power supply switch.	0—On 1—Off

Examples

Turn on the first power supply.

Request command:

```
55 AA 00 5D FE 00 00 00 00 00 01 00 10 00 00 05 01 00 00 C7 56 0D 0A
```

Acknowledge data package:

```
AA 55 00 5D 00 FE 00 00 00 00 01 00 10 00 00 05 00 00 C6 56
```

- 10H—Offset address of the first power supply switch
- 11H—Offset address of the second power supply switch
- 12H—Offset address of the third power supply switch
- ...
- 17H—Offset address of the eighth power supply switch
- No.13—Status of the power supply switch
- 00—On
- 01—Off

Brightness adjustments

Adjust the overall brightness, as well as the brightness of each color component.

Parameters

- Device: Receiving card
- Base address: 02000000 H
- Data length: 5HAll

Values are read/write.

Commands

Offset	Name	Description	Values
0x000001	Global Brightness	Indicates the overall brightness.	0 to 255 0—Minimum brightness 255—Maximum brightness
0x000002	Red Brightness	Indicates the brightness of the red component.	
0x000003	Green Brightness	Indicates the brightness of the green component.	
0x000004	Blue Brightness	Indicates the brightness of the blue component.	
0x000005	V Red Brightness	Indicates the brightness of the virtual red component.	

Examples

Read the brightness of the first receiving card.

Request command:

```
55 AA 00 14 FE 00 01 00 00 00 00 00 01 00 00 02 05 00 70 56 0D 0A
```

Acknowledge data package:

```
AA 55 00 14 00 FE 01 00 00 00 00 00 01 00 00 02 05 00 FF FF FF FF FF 6B 5B
```

Set the overall brightness, and brightness of all five components as 128.

Request command:

```
55 AA 00 15 FE 00 01 00 00 00 01 00 01 00 00 02 05 00 80 80 80 80 80 F2 58 0D 0A
```

Acknowledge data package:

```
AA 55 00 15 00 FE 01 00 00 00 01 00 01 00 00 02 00 00 6D 56
```

Set the overall brightness of one component as 128.

Request command:

```
55 AA 00 15 FE 00 01 00 00 00 01 00 01 00 00 02 01 00 80 EE 56 0D 0A
```

Acknowledge data package:

```
AA 55 00 15 00 FE 01 00 00 00 01 00 01 00 00 02 00 00 6D 56
```

Set all receiving cards on the same Ethernet port overall brightness and brightness of all five components as 128.

Request command:

```
55 AA 00 15 FE 00 01 00 FF FF 01 00 01 00 00 02 05 00 80 80 80 80 80 F0 5A 0D 0A
```

Acknowledge data package:

```
AA 55 00 15 00 FE 01 00 FF FF 01 00 01 00 00 02 00 00 6B 58
```

When broadcasting the commands on one Ethernet port, set the response device's number as FF. Setting the scan board address as FF FF causes all the receiving cards connected on the same Ethernet port to receive the write data command.

Set all receiving cards on all Ethernet ports overall brightness and brightness of all five components as 128.

Request command:

```
55 AA 00 15 FE 00 01 FF FF FF 01 00 01 00 00 02 05 00 80 80 80 80 80 EF 5B 0D 0A
```

Acknowledge data package:

```
AA 55 00 15 00 FE 01 FF FF FF 01 00 01 00 00 02 00 00 6A 59
```

Related information

Parameter store (on page 28)

Reset sending cards and controllers to factory settings

All sending cards and controllers are reset to the original setting.

Parameters

- Device: Sending card
- Base address: 0100_0000H
- Data length: 1H

Commands

Offset	Bits	Default (H)
02H	8	00 Writing any value to this register activates the operation, resetting all sending cards/controllers to factory settings except 00H.

Examples

Request command:

```
55 AA 00 32 FE 00 00 00 00 00 01 00 02 00 00 01 01 00 01 8B 56 0D 0A
```

Acknowledge data package:

```
AA 55 00 32 00 FE 00 00 00 00 01 00 02 00 00 01 00 00 89 56
```

Gamma value

The Gamma value is one of the parameters in the gamma transform equation and is stored in the receiving card. In the gamma transform equation:

- y—Output value of gamma transform
- m—Data width of output value
- x—Input value of gray scale

- n—Data width of input value. Normally n=8

Parameters

- Device: Receiving card
- Base Address: 02000000 H
- Data length: 1H

Commands

Offset	Name	Attribute	Description
0x000000	Gamma	Read/Write	Gamma values

Examples

```
Request command:
55 AA 00 15 FE 00 01 00 00 00 00 00 00 00 00 02 01 00 6C 56 0D 0A

Acknowledge data package:
AA 55 00 15 00 FE 01 00 00 00 00 00 00 00 00 02 01 00 1C 88 56

1C=Gamma value is 2.8.
```

Gamma table

Gamma table is used for data transform, based on the look-up table method.

When the receiving card receives the video data from sending card, it finishes the transformation through look-up table method. Parameters must be stored into the flash.

Offset addresses 0x000100 to 0x0003ff are reserved.

Parameters

- Device: Receiving card
- Base address: 0x0500_0000H
- Data length: 400H

Commands

Command	Name	Bits	Attribute
0x000000 ... 0x0003ff	GammaTable	16	Read/Write

Related information

Parameter store (on page 28)

Sending cards and control firmware version

Read the firmware version of the sending cards.

Parameters

- Device: Sending card
- Base address: 0x0400_0000H
- Data length: 4H

Commands

Command	Name	Bits	Attribute	Description
10_0004	FPGA program	8	Read/Write	The version number has four parts. Each part is represent by one byte.

Examples

Request command:
55 AA 00 15 FE 00 00 00 00 00 00 00 04 00 10 04 04 00 84 56 0D 0A

Acknowledge data package:
AA 55 00 15 00 FE 00 00 00 00 00 00 04 00 10 04 04 00 04 03 00 00 8B 56

04 03 00 00—FPGA program version is 4.3.0.0

Hardware identification

Learn how to identify the receiving cards, controllers, and the function cards.

Receiving card ID

Identify the receiving card model.

Parameters

- Device: Receiving card
- Base address: 0x0200_0200H
- Data length: 2H

Model IDs

Device type	Model ID (high-byte)	Model ID (low-byte)
CBR300	42	81
XC200	41	82

Examples

Request command:
55 AA 00 32 FE 00 01 00 00 00 00 00 00 02 00 02 02 00 8C 56 0D 0A

Acknowledge data package :
AA 55 00 32 00 FE 01 00 00 00 00 00 00 02 00 02 02 00 81 42 4F 57

The Model ID of CBR300 is 81 42H.

Sending card ID

Identify the sending card model.

Parameters

- Device: Sending card
- Base address: 0x0000_0000H
- Data length: 2H

Model IDs

Device type	Model ID (high-byte)	Model ID (low-byte)
E510	0x11	0x5F

Commands

Offset (H)	Name	Bits	Attributes	Desription
2H	Controller/Sender Model ID	8	R	Low byte of the controller model ID
3H				High byte of the controller model ID

Examples

Request command:
55 AA 00 32 FE 00 00 00 00 00 00 00 02 00 00 00 02 00 87 56 0D 0A

Acknowledge data package:
AA 55 02 32 00 FE 00 00 00 00 00 00 02 00 00 00 02 00 11 5F 9E 56

Function card ID

Identify the function card model.

Parameters

- Device: Function card
- Base address: 0x0000_0000H
- Data length: 2H

Model IDs

Device type	Model ID (high-byte)	Model ID (low-byte)
MFN300	0x81	0x01

Commands

Offset (H)	Name	Bits	Desription
2H	FuncCardModel ID	Read-only	Low byte of the controller model ID
3H			High byte of the controller model ID

Examples

Request command:
55 AA 00 32 FE 00 02 00 00 00 00 00 02 00 00 00 02 00 8B 56 0D 0A

Acknowledge data package:
AA 55 00 32 00 FE 02 00 00 00 00 00 02 00 00 00 02 00 01 81 0D 57

Receiving card working status

Read the model ID of the receiving card to determine the status of the card.

If the ID can be read, the receiving card is working normally. Otherwise, the receiving card might not work.

Parameters

- Device: Receiving card
- Base address: 0x0200_0200H
- Data length: 2H

Commands

Offset (H)	Name	Bits	Desription
0x000000 0x000001	ScanCardModle	R	A valid Model ID is a value other than 00.

Examples

Request command:
55 AA 00 15 FE 00 01 00 00 00 00 00 00 00 00 00 02 00 6B 56 0D 0A

Acknowledge data package:
AA 55 01 15 00 FE 01 00 00 00 00 00 00 00 00 00 02 00 81 42 2F 57

The feedback ID is 81 42, meaning the receiving card A8S works normally.

Sending card resolution setting

To set the resolution and refresh rate of sending card, write the specified content into EDID register.

The EDID space address is 0x0800_0000H −0x0800_00FFH. For EDID structure 1.3, 128 bytes data should be written into specified address.

This document describes the basic 128-byte data structure in EDID 1.3. To obtain the latest standard and any support documentation, contact VESA.

Parameters

- Device: Sending card
- Base address: 0x0800_0000H
- Data length: 1H

Commands

Offset (H)	Name	Bits	Desription
0x00	8	Read/Write	EDID Register0
...	...	...	...

0x7F	8	Read/Write	EDID Register127

Examples

Set the resolution as 1440×900 @60Hz, the EDID content of 128 bytes:

```
00 FF FF FF FF FF FF 00 39 F6 05 04 13 06 28 00
10 17 01 03 81 1E 17 B4 EA C1 E5 A3 57 4E 9C 23
1D 50 54 21 08 00 01 01 01 01 01 01 01 01 01 01
01 01 01 01 01 01 10 23 A0 A0 50 84 23 30 30 20
36 00 CB 28 11 00 00 1E 00 00 00 FF 00 4E 4F 56
41 53 54 41 52 4D 33 00 00 00 00 00 00 FC 00 4D
41 52 53 A3 44 49 53 50 4C 41 59 00 00 00 00 FD
00 30 7B 1C C8 11 00 0A 20 20 20 20 20 20 00 E9 0D 0A
```

Set the resolution as 1920×1080 @60Hz, the EDID content of 128 bytes:

```
00 FF FF FF FF FF FF 00 39 F6 05 04 13 06 28 00
10 17 01 03 81 1E 17 B4 EA C1 E5 A3 57 4E 9C 23
1D 50 54 21 08 00 01 01 01 01 01 01 01 01 01 01
01 01 01 01 01 01 5B 36 80 A0 70 38 23 40 30 20
36 00 CB 28 11 00 00 1E 00 00 00 FF 00 4E 4F 56
41 53 54 41 52 4D 33 00 00 00 00 00 00 FC 00 4D
41 52 53 A3 44 49 53 50 4C 41 59 00 00 00 00 FD
00 30 7B 1C C8 11 00 0A 20 20 20 20 20 20 00 C7 0D 0A
```

Display control register setting

Display colors and patterns on the screen.

Parameters

- Device: Receiving card
- Base address: 0x0200_0000H
- Data length: 1H

Commands

Offset (H)	Name	Bits	Attribute	Description
0x000101	SelfTestMode	8	Read/Write	The value of each function refers to the Receiving card display function table. 0x00 (Default)

Receiving card display function

Register value	Description
0x00	Reserved
0x01	Reserved
0x02	Red

0x03	Green
0x04	Blue
0x05	White
0x06	Horizon line
0x07	Vertical line
0x08	Incline line
0x09	Auto Grayscale Increasing (256 Grade)
0x0a	Aging (Loop all kinds of test mode above)

Examples

Display a blue image on the first receiving card. Request command: 55 AA 00 80 FE 00 01 00 00 00 01 00 01 01 00 02 01 00 04 DE 56 0D 0A Acknowledge data package: AA 55 00 80 00 FE 01 00 00 00 01 00 01 01 00 02 00 00 D7 58
Display a red image on all receiving cards on the same sending card Ethernet port. Request command: 55 AA 00 80 FE 00 01 00 FF FF 01 00 01 01 00 02 01 00 02 DA 58 0D 0A Acknowledge data package: AA 55 00 80 00 FE 01 00 FF FF 01 00 01 01 00 02 00 00 D7 58
Display a horizon line for all receiving cards on the same sending card Ethernet port. Request command: 55 AA 00 80 FE 00 01 00 FF FF 01 00 01 01 00 02 01 00 06 DE 58 0D 0A Acknowledge data package: AA 55 00 80 00 FE 01 00 FF FF 01 00 01 01 00 02 00 00 D7 58
Recover the video image setting for the first receiving card. Request command: 55 AA 00 80 FE 00 01 00 00 00 01 00 01 01 00 02 01 00 00 DA 56 0D 0A Acknowledge data package: AA 55 00 80 00 FE 01 00 00 00 01 00 01 01 00 02 00 00 D9 56
Recover video image setting for all receiving cards on the same sending card Ethernet port. Request command : 55 AA 00 80 FE 00 01 00 FF FF 01 00 01 01 00 02 01 00 00 D8 58 0D 0A Acknowledge data package: AA 55 00 80 00 FE 01 00 FF FF 01 00 01 01 00 02 00 00 D7 58

Display mode setting

Kill or lock the image settings for the receiver cards.

Parameters

- Device: Receiving card
- Base address: 0x0200_0000H
- Data length: 1H

Commands

Offset (H)	Name	Bits	Attribute	Description
0x000101	KillMode	8	Read/Write	0xff—Black display 0x00—Normal display
0x000102	LockMode	8	Read/Write	0xff—Lock display 0x00—Normal display

Examples

Kill the image setting for the first receiving card:

Request command:
55 AA 00 80 FE 00 01 00 00 00 01 00 00 01 00 02 01 00 FF D8 57 0D 0A

Acknowledge data package:
AA 55 00 80 00 FE 01 00 00 00 01 00 00 01 00 02 00 00 D8 56

Kill the image setting for all receiving cards on the same sending card Ethernet port.

Request command:
55 AA 00 80 FE 00 01 00 FF FF 01 00 00 01 00 02 01 00 FF D6 59 0D 0A

Acknowledge data package:
AA 55 00 80 00 FE 01 00 FF FF 01 00 00 01 00 02 00 00 D6 58

Lock the image setting for the first receiving card.

Request command:
55 AA 00 80 FE 00 01 00 00 00 01 00 02 01 00 02 01 00 FF DA 57 0D 0A

Acknowledge data package:
AA 55 00 80 00 FE 01 00 00 00 01 00 02 01 00 02 00 00 DA 56

Lock the image setting for all receiving cards on the same sending card Ethernet port.

Request command:
55 AA 00 80 FE 00 01 00 FF FF 01 00 02 01 00 02 01 00 FF D8 59 0D 0A

Acknowledge data package:
AA 55 00 80 00 FE 01 00 FF FF 01 00 02 01 00 02 00 00 D8 58

Calibration control

Calibrate the displays.

Parameters

- Device: Receiving card
- Base address: 0x0200_0000H
- Data length: 1H

Commands

Offset (H)	Name	Bits	Attribute	Description
0x000051	CorrectionOn	8	Read/Write	Bit[0]: calibration on/off • 0—Calibration off • 1—Calibration on Bit[1]: calibration type • 0—Color calibration • 1—Brightness calibration Bit[7:2]: Reserved, "000000" Examples: • 0x00—Calibration off • 0x03—Brightness calibration on • 0x01—Color calibration on

Examples

Turn off calibration:

```
55 AA 00 7F FE 00 01 00 FF FF 01 00 51 00 00 02 01 00 00 26 59 0D 0A
```

Reconnect sending card or receiving card

Determine if the sending or receiver card is connected.

Parameters

- Device: Receiving card
- Base address: 0x0000_0000H
- Data length: 2H

Commands

Offset (H)	Name	Bits	Attribute	Description	Default (H)
2H	Controller/Sender Model ID	8	Read	Low byte of the controller model ID	Any result other than 00 indicates the card is connected.
3H		8	Read	High byte of the controller model ID	

Examples

Request command:
55 AA 00 AA FE 00 00 00 00 00 00 00 02 00 00 00 02 00 01 57 0D 0A

Acknowledge data package:
AA 55 00 AA 00 FE 00 00 00 00 00 00 02 00 00 00 02 00 01 00 02 57

Parameter store

Write any parameter into the flash.

Parameters

- Device: Receiving card
- Base address: 0x0100_0000H
- Data length: 1H

Commands

Command	Name	Bits	Attribute
11H	Parameter store	8	Write

Examples

Set all receiving cards on all Ethernet ports overall brightness and brightness of all five components as 128, 0, 128, 128.

Request command:
55 AA 00 15 FE 00 01 FF FF FF 01 00 01 00 00 02 05 00 80 00 80 80 80 6F 5B 0D 0A

Acknowledge data package:
AA 55 00 15 00 FE 01 FF FF FF 01 00 01 00 00 02 00 00 6A 59

Set the brightness on all receiving cards to recover the last value when the screen powers off and on.

Request command:
55 AA 00 15 FE 00 01 FF FF FF 01 00 11 00 00 01 01 00 11 8B 59 0D 0A

Acknowledge data package:
AA 55 00 15 00 FE 01 FF FF FF 01 00 11 00 00 01 00 00 79 59