

## PIS screen serial port control protocol

V1.2

## Table of contents

|                                               |    |
|-----------------------------------------------|----|
| 1. Serial port configuration .....            | 3  |
| 2. Command format .....                       | 3  |
| 3. Detailed commands .....                    | 4  |
| 1. Switching on and off.....                  | 4  |
| 2. Signal switching.....                      | 5  |
| 3. volume.....                                | 7  |
| 3.1High and low peak volume settings.....     | 7  |
| 3.2Volume adjustment.....                     | 8  |
| 3.3Quiet Mode .....                           | 9  |
| 3.4Sound Mode Settings.....                   | 9  |
| 4. Operating temperature.....                 | 10 |
| 5. Backlight .....                            | 10 |
| 6. Noise Reduction .....                      | 10 |
| 7. bootLogomodel.....                         | 11 |
| 8. Remote lock.....                           | 11 |
| 9. Light Sensitivity Settings .....           | 12 |
| 10. Display parameter settings.....           | 13 |
| 11. VGALmage parameter settings.....          | 14 |
| 12. Image Ratio Settings .....                | 14 |
| 13. Reset .....                               | 15 |
| 14. Troubleshooting Information .....         | 15 |
| 15. Setting Energy Saver Mode.....            | 16 |
| 16. language settings.....                    | 16 |
| 17. High temperature protection settings..... | 17 |
| 18. Image protection settings.....            | 17 |
| 19. Image Test Setup .....                    | 18 |
| 20. Timed shutdown time setting.....          | 19 |
| 21.Timing start time setting.....             | 20 |
| 22.time setting.....                          | 22 |

## Change Description

| Version | date      | change content                                                                                                                                                                                                              |
|---------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| V1.1    | 2020.4.28 | <ol style="list-style-type: none"> <li>1. Add some example descriptions</li> <li>2. Add timing switch command</li> <li>3. Signal switching adds DP, SDI, HDMI2, HDMI3</li> <li>4. Add command to set system time</li> </ol> |
| V1.2    | 2020.6.02 | Increase the timing to open the high and low peak volume part of the protocol                                                                                                                                               |

## 1. Serial port configuration

Baud rate:9600bps Data  
 bits:8  
 Parity: none stop bit:1  
 data:HexFormat

## 2. Command format

|         |         |       |         |         |     |         |          |
|---------|---------|-------|---------|---------|-----|---------|----------|
| MsgSize | Control | Group | Data[0] | Data[1] | ... | Data[N] | Checksum |
|---------|---------|-------|---------|---------|-----|---------|----------|

specific description:

|       |      |           |            |
|-------|------|-----------|------------|
| field | byte | byte name | illustrate |
|-------|------|-----------|------------|

|          |                    |                 |                                                                                                                                                                                                            |
|----------|--------------------|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MsgSize  | Byte 1:            | length in bytes | MsgSize + Control + Data[0]+...+ Data[N]+<br>Checksum<br>scope:0x3 - 0x28(3arrive40)                                                                                                                       |
| Control  | Byte 2:            | Control         | monitorID:1-255,0for global control                                                                                                                                                                        |
| Group    | Byte 3:            | Group           | control groupIDscope:0-254<br>Monitor ID Group ID<br><br>0-255 0-254 scope<br>0 0 broadcast<br>1-255 0 Monitor IDcontrol<br>system system<br>0-255 1-254 Group IDcontrol                                   |
| Data     | Byte 4 to Byte 39: | Data[0]-Data[N] | This byte can be empty;<br>If not empty range:0-0x24(0arrive36)                                                                                                                                            |
| Checksum | Last Byte:         | check sum       | range=0-0xFF(0 to 255) XOR operation of all<br>fields except the checksum bit<br><br>minus one after calculation;<br>Checksum = [MSG-SIZE] XOR [CONTROL] XOR<br>[GROUP] XOR DATA[0] ... XOR DATA[N] - 0x01 |

### 3. Detailed command

#### 1.switch machine

Switch status query:

| Bytes   | describe                           | Bits | illustrate                 |
|---------|------------------------------------|------|----------------------------|
| DATA[0] | 0x19 =Inquire about<br>power state |      | Query monitor power status |

The switch state returns:

| Bytes   | describe                     | Bits | illustrate                     |
|---------|------------------------------|------|--------------------------------|
| DATA[0] | 0x19 =back to power<br>state |      | Feedback Monitor Power Status  |
| DATA[1] | power state                  |      | 0x01 =closure<br>0x02 =turn on |

Switch state settings:

| Bytes   | describe          | Bits | illustrate              |
|---------|-------------------|------|-------------------------|
| DATA[0] | 0x18 =power state |      | Set Monitor Power State |

## PISscreen serial protocol

Document Confidentiality: Internal Confidentiality

|         |             |  |                                |
|---------|-------------|--|--------------------------------|
|         | set up      |  |                                |
| DATA[1] | power state |  | 0x01 =closure<br>0x02 =turn on |

Switch setting status feedback:

| Bytes   | describe                    | Bits | illustrate                               |
|---------|-----------------------------|------|------------------------------------------|
| DATA[0] | 0x17 =power state<br>set up |      | Feedback switch command execution status |
| DATA[1] | power state                 |      | 0x01 =success<br>0x02 =fail              |

Example:

Set all monitors power state to off

| MsgSize | Control | Group | Data[0] | Data[1] | Checksum |
|---------|---------|-------|---------|---------|----------|
| 06      | 00      | 00    | 18      | 01      | 1E       |

0101Monitor feedback successful execution

| MsgSize | Control | Group | Data[0] | Data[1] | Checksum |
|---------|---------|-------|---------|---------|----------|
| 06      | 01      | 01    | 17      | 01      | 0F       |

## 2.signal switching

Signal query:

| Bytes   | describe           | Bits | illustrate        |
|---------|--------------------|------|-------------------|
| DATA[0] | 0xAD =Signal query |      | Query signal type |

Signal returns:

| Bytes   | describe                           | Bits | illustrate                                                                                                                          |
|---------|------------------------------------|------|-------------------------------------------------------------------------------------------------------------------------------------|
| DATA[0] | 0xAD =Source<br>information return |      | Feedback the current input source signal type                                                                                       |
| DATA[1] | Signal source type                 |      | 0x01 = DVI 0x02<br>= HDMI<br><br>0x03 = VGA<br>0x04 = USB<br>0x05 = OPS<br><br>0x06 = HDMI2<br>0x07 = DP 0x08 =<br>SDI 0x09 = HDMI3 |
| DATA[2] | reserved                           |      | 0x01 = DVI                                                                                                                          |

# PISscreen serial protocol

Document Confidentiality: Internal Confidentiality

|         |         |        |                                                                                                            |
|---------|---------|--------|------------------------------------------------------------------------------------------------------------|
|         |         |        | 0x02 = HDMI 0x03<br>= VGA 0x04 = USB<br>0x05 = OPS 0x06<br>= HDMI2 0x07 =<br>DP 0x08 = SDI<br>0x09 = HDMI3 |
| DATA[3] | OSDtype | Bit7   | reserved, meaningless                                                                                      |
|         |         | Bit6   | reserved, meaningless                                                                                      |
|         |         | Bit2.0 | Monitor input source information 0<br>=meaningless;1 =Display source information                           |

## Signal Settings:

| Bytes   | describe                | Bits   | illustrate                                                                                                                              |
|---------|-------------------------|--------|-----------------------------------------------------------------------------------------------------------------------------------------|
| DATA[0] | 0xAC =set signal source |        | Set the current input source signal                                                                                                     |
| DATA[1] | Signal source type      |        | 0x01 = DVI 0x02<br>= HDMI<br><br>0x03 = VGA<br>0x04 = USB<br>0x05 = OPS<br><br>0x06 = HDMI2<br>0x07 = DP 0x08 =<br>SDI 0x09 = HDMI3     |
| DATA[2] | reserved                |        | 0x01 = DVI 0x02<br>= HDMI<br><br>0x03 = VGA<br>0x04 = USB<br>0x05 = OPS<br><br>0x06 = HDMI2<br>0x07 = DP 0x08 =<br>SDI 0x09 = HDMI3     |
| DATA[3] | OSDtype                 | Bit7   | reserved                                                                                                                                |
|         |                         | Bit6   | No switching, display the current signal source type; switch then display the switched signal source type<br>1 =do not switch;0 =toggle |
|         |                         | Bit2.0 | Monitor input source information<br>0 =meaningless;1 =Display source information                                                        |
| DATA[4] | reserved                |        |                                                                                                                                         |

Example: Set all monitor display channels to HDMI

# PISScreen serial protocol

Document Confidentiality: Internal Confidentiality

| MsgSize | Control | Group | Data[0] | Data[1] | Data[2] | Data[3] | Data[3] | Checksum |
|---------|---------|-------|---------|---------|---------|---------|---------|----------|
| 09      | 00      | 00    | AC      | 02      | 02      | 01      | 00      | A3       |

## 3.volume

### 3.1High and low peak volume settings

Query information about high and low peak modes:

| Bytes   | describe                                                  | Bits | illustrate                                  |
|---------|-----------------------------------------------------------|------|---------------------------------------------|
| DATA[0] | 0x43 =Query high and low peaks                            |      | Querying High and Low Peak Mode Information |
| DATA[1] | information<br>0x00=standard/peak/low<br>Peak information |      | 0x00 =standard;0x01 =peak; 0x02 =low peak   |

Returns high and low peak mode information:

| Bytes   | describe                     | Bits | illustrate                                                                                                    |
|---------|------------------------------|------|---------------------------------------------------------------------------------------------------------------|
| DATA[0] | 0x43 =High and low peak mode |      | Feedback high and low peak mode information                                                                   |
| DATA[1] | Standard/peak/low peak       |      | 0x00 =standard;0x01 =peak; 0x02 =low peak                                                                     |
| DATA[2] | volume                       |      | The range is0-100                                                                                             |
| DATA[3] | Effective period             |      | 0x00 =closure;<br>0x01 =Monday ~ Friday; 0x02 =Monday<br>~ Saturday 0x03=Saturday ~ Sunday<br>0x04=every day; |
| DATA[4] | start time-hour              |      | The range is0-23                                                                                              |
| DATA[5] | start time-min               |      | The range is0-59                                                                                              |
| DATA[6] | end time - seconds           |      | The range is0-59                                                                                              |

To set high and low peak times:

| Bytes   | describe               | Bits | illustrate                                                                                                      |
|---------|------------------------|------|-----------------------------------------------------------------------------------------------------------------|
| DATA[0] | 0x42=sound mode        |      | Set high and low peak mode                                                                                      |
| DATA[1] | Standard/peak/low peak |      | 0x00 =standard;0x01 =peak; 0x02 =low peak                                                                       |
| DATA[2] | volume                 |      | The range is0-100                                                                                               |
| DATA[3] | Effective period       |      | 0x00 =closure;<br>0x01 =Monday ~ Friday; 0x02 =Monday<br>~ Saturday; 0x03=Saturday ~ Sunday;<br>0x04=every day; |
| DATA[4] | start time-hour        |      | The range is0-23                                                                                                |
| DATA[5] | start time-min         |      | The range is0-59                                                                                                |

# PISscreen serial protocol

Document Confidentiality: Internal Confidentiality

|         |                    |  |                  |
|---------|--------------------|--|------------------|
| DATA[6] | end time - seconds |  | The range is0-59 |
|---------|--------------------|--|------------------|

illustrate:

1, When there is a conflict between the set time periods between high and low peaks, the settings will not take effect, and the following values will be returned:

|         |         |       |    |          |    |          |
|---------|---------|-------|----|----------|----|----------|
| MsgSize | Control | Group | 42 | 00/01/02 | 00 | Checksum |
|---------|---------|-------|----|----------|----|----------|

2, the screen high and low peak time defaults to00:00-00:00, indicating that the high-low peak mode is turned off;

Set the effective period of high and low peak mode:

| Bytes   | describe                                                                | Bits | illustrate                                                                                                         |
|---------|-------------------------------------------------------------------------|------|--------------------------------------------------------------------------------------------------------------------|
| DATA[0] | 0x50 =Set high and low peaks                                            |      | Set High and Low Peak Mode Period                                                                                  |
| DATA[1] | Effective period<br><br>Query standard/peak/low<br><br>Peak information |      | 0x00 =closure;<br>0x01 =Monday ~ Friday; 0x02<br>=Monday ~ Saturday;<br>0x03=Saturday ~ Sunday;<br>0x04=every day; |

## 3.2Volume adjustment

Adjust the user volume as follows:

| Bytes   | describe           | Bits | illustrate                              |
|---------|--------------------|------|-----------------------------------------|
| DATA[0] | 0x45 =volume query |      | Query the current volume of the monitor |

Volume returns:

| Bytes   | describe          | Bits | illustrate                      |
|---------|-------------------|------|---------------------------------|
| DATA[0] | 0x45 =volume back |      | Feedback monitor current volume |
| DATA[1] | speaker volume    |      | 0-100(%) value                  |

Volume settings:

| Bytes   | describe             | Bits | illustrate                     |
|---------|----------------------|------|--------------------------------|
| DATA[0] | 0x44 =volume setting |      | Set the monitor current volume |
| DATA[1] | speaker volume       |      | adjust0-100(%) value           |

Volume adjustment - up or down

| Bytes   | describe                               | Bits | illustrate                       |
|---------|----------------------------------------|------|----------------------------------|
| DATA[0] | 0x41 =adjust volume plus<br><br>reduce |      | Adjust monitor volume up or down |
| DATA[1] | speaker volume                         |      | 0:decline;1:rise;2:constant      |

Example: Set all monitor volume to80

| MsgSize | Control | Group | Data[0] | Data[1] | Checksum |
|---------|---------|-------|---------|---------|----------|
| 06      | 00      | 00    | 44      | 50      | 11       |



**3.3 silent mode**

Quiet mode query

| Bytes   | describe                | Bits | illustrate        |
|---------|-------------------------|------|-------------------|
| DATA[0] | 0x46 =Query silent mode |      | Query silent mode |

Silent mode returns:

| Bytes   | describe                     | Bits | illustrate                   |
|---------|------------------------------|------|------------------------------|
| DATA[0] | 0x46 =returnsilent mode Mode |      | Feedback silent mode         |
| DATA[1] |                              |      | 0x01 =Mute on:0x00: mute off |

Silent Mode Settings:

| Bytes   | describe              | Bits | illustrate                   |
|---------|-----------------------|------|------------------------------|
| DATA[0] | 0x47 =Set silent mode |      | Set silent mode              |
| DATA[1] |                       |      | 0x01 =Mute on:0x00: mute off |

**3.4 Sound Mode Settings**

Sound mode query

| Bytes   | describe               | Bits | illustrate        |
|---------|------------------------|------|-------------------|
| DATA[0] | 0x48 =query sound mode |      | Query silent mode |

Sound mode returns:

| Bytes   | describe                   | Bits | illustrate                                                        |
|---------|----------------------------|------|-------------------------------------------------------------------|
| DATA[0] | 0x49 =Return to sound mode |      | Feedback sound mode                                               |
| DATA[1] |                            |      | 0x01 =standard;0x02 =music; 0x03 =Movie;0x04 =sports; 0x05 =user; |

Sound Mode Settings:

| Bytes   | describe             | Bits | illustrate                                                        |
|---------|----------------------|------|-------------------------------------------------------------------|
| DATA[0] | 0x49 =set sound mode |      | set sound mode                                                    |
| DATA[1] |                      |      | 0x01 =standard;0x02 =music; 0x03 =Movie;0x04 =sports; 0x05 =user; |

#### 4. Operating temperature

Working temperature query:

| Bytes   | describe                        | Bits | illustrate                                  |
|---------|---------------------------------|------|---------------------------------------------|
| DATA[0] | 0x2F =Query working temperature |      | Query the current temperature of the sensor |

Operating temperature returns:

| Bytes   | describe               | Bits | illustrate                  |
|---------|------------------------|------|-----------------------------|
| DATA[0] | 0x2F=Return to working |      | Feedback sensor temperature |
| DATA[1] | Temperature Sensor 1   |      | scope:0-100°C               |
| DATA[2] | Temperature Sensor2    |      | scope:0-100°C               |

#### 5. Backlight

Query backlight:

| Bytes   | describe                        | Bits | illustrate                    |
|---------|---------------------------------|------|-------------------------------|
| DATA[0] | 0x25 =Query the backlight value |      | Query monitor backlight value |

Back to Backlight:

| Bytes   | describe                          | Bits | illustrate                       |
|---------|-----------------------------------|------|----------------------------------|
| DATA[0] | 0x25 =Returns the backlight value |      | Feedback monitor backlight value |
| DATA[1] |                                   |      | adjust0-100(%) value             |

set backlight

| Bytes   | describe                         | Bits | illustrate                         |
|---------|----------------------------------|------|------------------------------------|
| DATA[0] | 0x24 =Adjust the backlight value |      | Adjust the monitor backlight value |
| DATA[1] | Addition and subtraction         |      | 0:decline;1:rise;2:constant        |

#### 6. Noise reduction

Query noise reduction level:

| Bytes   | describe                          | Bits | illustrate                          |
|---------|-----------------------------------|------|-------------------------------------|
| DATA[0] | 0x2B =Query noise reduction level |      | Query monitor noise reduction level |
|         | do not                            |      |                                     |

Return the noise reduction level:

| Bytes   | describe                              | Bits | illustrate                             |
|---------|---------------------------------------|------|----------------------------------------|
| DATA[0] | 0x2B =Return to noise reduction level |      | Feedback monitor noise reduction level |

|         |                     |  |                                               |
|---------|---------------------|--|-----------------------------------------------|
| DATA[1] | Off/Low/Medium/High |  | 0x00 =close;0x01 =Low;0x02 =middle 0x03 =high |
|---------|---------------------|--|-----------------------------------------------|

To set the noise reduction level:

| Bytes   | describe                            | Bits | illustrate                                    |
|---------|-------------------------------------|------|-----------------------------------------------|
| DATA[0] | 0x2A =Set the noise reduction level |      | Adjusting the monitor noise reduction level   |
| DATA[1] | Off/Low/Medium/High                 |      | 0x00 =close;0x01 =Low;0x02 =middle 0x03 =high |

## 7.bootLogomodel

Query bootLogo:

| Bytes   | describe                   | Bits | illustrate                      |
|---------|----------------------------|------|---------------------------------|
| DATA[0] | 0x3F =Query bootLogo model |      | Query monitor power onLogomodel |

back to bootLogo:

| Bytes   | describe                     | Bits | illustrate                         |
|---------|------------------------------|------|------------------------------------|
| DATA[0] | 0x3F =back to boot Logomodel |      | Feedback Monitor onLogomodel       |
| DATA[1] | off/on/user                  |      | 0x00 =close;0x01 =open; 0x02 =user |

set bootLogo:

| Bytes   | describe                      | Bits | illustrate                           |
|---------|-------------------------------|------|--------------------------------------|
| DATA[0] | 0x3E =set on machineLogomodel |      | Set the monitor to power onLogomodel |
| DATA[1] | off/on/user                   |      | 0x00 =close;0x01 =open; 0x02 =user   |

## 8.remote lock

Query remote lock status:

| Bytes   | describe                      | Bits | illustrate                                                                                                                                |
|---------|-------------------------------|------|-------------------------------------------------------------------------------------------------------------------------------------------|
| DATA[0] | 0x1D =Query remote lock state |      | Query monitor remote lock status, unlocked/Lock all / lock all but sound / remove power All locks outside source/all except sound & power |

Certainly

Return to remote lock level:

| Bytes | describe | Bits | illustrate |
|-------|----------|------|------------|
|-------|----------|------|------------|

|         |                                 |  |                                                                                                                                                     |
|---------|---------------------------------|--|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| DATA[0] | 0x1D =Back to Remote Lock state |  | Feedback monitor remote lock status, unlocked/<br>Lock all / lock all but sound / remove power All locks<br>outside source/all except sound & power |
| DATA[1] | Remote Lock Status Byte         |  | 0x01 =not locked;<br>0x02 =lock all;<br>0x03 =All locked except power<br>0x04 =All locked except sound<br>0x07 =Locked except for sound & power     |

To set up a remote lock:

| Bytes   | describe                 | Bits | illustrate                                                                                                                                      |
|---------|--------------------------|------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| DATA[0] | 0x1C =Set up remote lock |      | Set monitor remote lock, unlock/lock All / except<br>sound locked / except power<br>All Locked / All Locked Except Sound & Power                |
| DATA[1] | Remote Lock Status Byte  |      | 0x01 =not locked;<br>0x02 =lock all;<br>0x03 =All locked except power<br>0x04 =All locked except sound<br>0x07 =Locked except for sound & power |

## 9.Light sensitivity settings

Query light sensor information:

| Bytes   | describe                                  | Bits | illustrate                           |
|---------|-------------------------------------------|------|--------------------------------------|
| DATA[0] | 0x25 =Query Light Sensitivity<br>interest |      | Query Light Sensing Information Mode |

Return to light sensing mode:

| Bytes   | describe                                   | Bits | illustrate                                               |
|---------|--------------------------------------------|------|----------------------------------------------------------|
| DATA[0] | 0x25 =light sensor mode<br>letter interest |      | Feedback Monitor Light Sensing Mode                      |
| DATA[1] | off/on                                     |      | 0x00 =close;0x01 =open; 0xFF =Invalid<br>in current mode |

To set the light sensitivity mode:

| Bytes   | describe                       | Bits | illustrate                         |
|---------|--------------------------------|------|------------------------------------|
| DATA[0] | 0x24 = set light<br>sense mode |      | Set Monitor Light Sensing Mode     |
| DATA[1] | off/on                         |      | 0x00 =close;0x01 =open; 0x02 =user |

**10.Display parameter settings**

Query display parameter information:

| Bytes   | describe                       | Bits | illustrate                          |
|---------|--------------------------------|------|-------------------------------------|
| DATA[0] | 0x33 =query display parameters |      | Query display parameter information |

number information

Return to display parameter information:

| Bytes   | describe                | Bits | illustrate                                                                |
|---------|-------------------------|------|---------------------------------------------------------------------------|
| DATA[0] | 0x33 =Display parameter |      | Feedback display parameter information                                    |
| DATA[1] | image mode              |      | 0x00 =standard;0x01 =dynamic; 0x02 =soft;0x03 =user; 0x04 =eye protection |
| DATA[2] | color temperature       |      | 0x00 =standard;0x01 =warm color; 0x02 =cool color;                        |
| DATA[3] | brightness              |      | In user mode only, the optional ranges are:0-100                          |
| DATA[4] | Contrast                |      | In user mode only, the optional ranges are:0-100                          |
| DATA[5] | saturation              |      | In user mode only, the optional ranges are:0-100                          |
| DATA[6] | sharpness               |      | In user mode only, the optional ranges are:0-100                          |
| DATA[7] | Backlight               |      | The optional ranges are:0-100                                             |

Set display parameters:

| Bytes   | describe                     | Bits | illustrate                                                                |
|---------|------------------------------|------|---------------------------------------------------------------------------|
| DATA[0] | 0x32 =set parameter interest |      | Set display parameter information                                         |
| DATA[1] | image mode                   |      | 0x00 =standard;0x01 =dynamic; 0x02 =soft;0x03 =user; 0x04 =eye protection |
| DATA[2] | color temperature            |      | 0x00 =standard;0x01 =warm color; 0x02 =cool color;                        |
| DATA[3] | brightness                   |      | In user mode only, the optional ranges are:0-100                          |
| DATA[4] | Contrast                     |      | In user mode only, the optional ranges are:0-100                          |
| DATA[5] | saturation                   |      | In user mode only, the optional ranges are:0-100                          |
| DATA[6] | sharpness                    |      | In user mode only, the optional ranges are:0-100                          |

|         |           |  |                               |
|---------|-----------|--|-------------------------------|
| DATA[7] | Backlight |  | The optional ranges are:0-100 |
|---------|-----------|--|-------------------------------|

## 11.VGAIimage parameter settings

Query image scale information:

| Bytes   | describe                                  | Bits | illustrate                              |
|---------|-------------------------------------------|------|-----------------------------------------|
| DATA[0] | 0x39=InquireVGApicture<br>like parameters |      | InquireVGADisplay parameter information |

Return image scale information:

| Bytes   | describe                           | Bits | illustrate                               |
|---------|------------------------------------|------|------------------------------------------|
| DATA[0] | 0x39=VGAIimage parameter<br>number |      | feedbackVGADisplay parameter information |
| DATA[1] | clock                              |      | The adjustable range is:0-100;           |
| DATA[2] | phase                              |      | The adjustable range is:0-100;           |
| DATA[3] | horizontal position                |      | The adjustable range is:0-100;           |
| DATA[4] | vertical position                  |      | The adjustable range is:0-100;           |

Set display parameters:

| Bytes   | describe                                 | Bits | illustrate                             |
|---------|------------------------------------------|------|----------------------------------------|
| DATA[0] | 0x38=set upVGApicture<br>like parameters |      | set upVGADisplay parameter information |
| DATA[1] | clock                                    |      | The adjustable range is:0-100;         |
| DATA[2] | phase                                    |      | The adjustable range is:0-100;         |
| DATA[3] | horizontal position                      |      | The adjustable range is:0-100;         |
| DATA[4] | vertical position                        |      | The adjustable range is:0-100;         |

## 12.Image ratio settings

Query image scale information:

| Bytes   | describe                                      | Bits | illustrate                          |
|---------|-----------------------------------------------|------|-------------------------------------|
| DATA[0] | 0x3B=query image ratio<br>example information |      | Query display parameter information |

Return image scale information:

| Bytes   | describe                            | Bits | illustrate                       |
|---------|-------------------------------------|------|----------------------------------|
| DATA[0] | 0x3B=image scale letter<br>interest |      | Feedback image scale information |
| DATA[1] | image mode                          |      | 0x00=full screen;                |

|  |  |  |                                                                                                                               |
|--|--|--|-------------------------------------------------------------------------------------------------------------------------------|
|  |  |  | 0x01 =panoramic; 0x02<br>=peer to peer; 0x03<br>=automatic;<br>0x04 = 4:3; 0x05 = 16:9;<br>0x06 =enlarge1; 0x07<br>=enlarge2; |
|--|--|--|-------------------------------------------------------------------------------------------------------------------------------|

Set display parameters:

| Bytes   | describe                                        | Bits | illustrate                                                                                                                                       |
|---------|-------------------------------------------------|------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| DATA[0] | 0x32 = Display parameters<br>number information |      | Feedback display parameter information                                                                                                           |
| DATA[1] | image mode                                      |      | 0x00 =full screen; 0x01<br>=panoramic; 0x02 =peer<br>to peer; 0x03 =automatic;<br>0x04 = 4:3; 0x05 = 16:9;<br>0x06 =enlarge1; 0x07<br>=enlarge2; |

### 13.reset

Setting reset:

| Bytes   | describe    | Bits | illustrate      |
|---------|-------------|------|-----------------|
| DATA[0] | 0x56 =reset |      | parameter reset |

### 14.Fault information query

Query fault information:

| Bytes   | describe                                 | Bits | illustrate              |
|---------|------------------------------------------|------|-------------------------|
| DATA[0] | 0xA2 =Query the fault letter<br>interest |      | Query fault information |

Return fault information:

| Bytes   | describe                               | Bits | illustrate                                                                                                                  |
|---------|----------------------------------------|------|-----------------------------------------------------------------------------------------------------------------------------|
| DATA[0] | 0xA2 =return fault message<br>interest |      | feedback fault information                                                                                                  |
| DATA[1] | accident details                       |      | 0x00 =Temperature is too high;<br>0x01 =no signal;<br><br>0x02 =No signal and high temperature;<br><br>0x03 =No abnormality |

**15.Set energy saving mode**

Query the status of the energy saving mode:

| Bytes   | describe                             | Bits | illustrate                                    |
|---------|--------------------------------------|------|-----------------------------------------------|
| DATA[0] | 0X1B =Query energy saving mode state |      | Querying the status of the energy saving mode |

To return to the power saving mode state:

| Bytes   | describe                               | Bits | illustrate                         |
|---------|----------------------------------------|------|------------------------------------|
| DATA[0] | 0X1B =Back to energy saving mode state |      | Feedback energy saving mode status |
| DATA[1] | Power Save Mode Status                 |      | 0x00 =open; 0x01 =closure;         |

To set the power saving mode:

| Bytes   | describe                     | Bits | illustrate                   |
|---------|------------------------------|------|------------------------------|
| DATA[0] | 0X1A =Set energy saving mode |      | Set Energy Saver Mode Status |
| DATA[1] | energy saving mode           |      | 0x00 =open; 0x01 =closure;   |

**16.language settings**

Query language status:

| Bytes   | describe                   | Bits | illustrate            |
|---------|----------------------------|------|-----------------------|
| DATA[0] | 0X27 =query language state |      | query language status |

Return language status:

| Bytes   | describe                     | Bits | illustrate                    |
|---------|------------------------------|------|-------------------------------|
| DATA[0] | 0X27 =back to language state |      | feedback language status      |
| DATA[1] | language status              |      | 0x00 =Chinese; 0x01 =English; |

Set language mode:

| Bytes   | describe                     | Bits | illustrate                    |
|---------|------------------------------|------|-------------------------------|
| DATA[0] | 0X26 =set language mode Mode |      | set language mode             |
| DATA[1] | language mode                |      | 0x00 =Chinese; 0x01 =English; |



**17.High temperature protection settings**

Query the high temperature protection status:

| Bytes   | describe              | Bits | illustrate                               |
|---------|-----------------------|------|------------------------------------------|
| DATA[0] | 0XD1=high temperature |      | Query high temperature protection status |

protection state

Return language status:

| Bytes   | describe                                                    | Bits | illustrate                                  |
|---------|-------------------------------------------------------------|------|---------------------------------------------|
| DATA[0] | 0XD1 =Back to high temperature protection protection status |      | Feedback high temperature protection status |
| DATA[1] | High temperature protection switch status                   |      | 0x00 =open; 0x01 =close;                    |
| DATA[2] | High temperature protection threshold                       |      | 0-100(%) value                              |

Set language mode:

| Bytes   | describe                                                | Bits | illustrate                             |
|---------|---------------------------------------------------------|------|----------------------------------------|
| DATA[0] | 0XD0 =Set high temperature protection protection status |      | Set high temperature protection status |
| DATA[1] | High temperature protection switch status               |      | 0x00 =open; 0x01 =close;               |
|         | High temperature protection threshold                   |      | 0-100(%) value                         |

**18.Image protection settings**

Query image protection status:

| Bytes   | describe                                        | Bits | illustrate                    |
|---------|-------------------------------------------------|------|-------------------------------|
| DATA[0] | 0X29=Query image preservation protection status |      | Query image protection status |

Return to image protection status:

| Bytes   | describe                                    | Bits | illustrate                                                                                 |
|---------|---------------------------------------------|------|--------------------------------------------------------------------------------------------|
| DATA[0] | 0X29 =back to image saver protection status |      | Feedback image protection status                                                           |
| DATA[1] | Image protection status                     |      | 0x00 =close;<br>0x01 =image protection1; 0x02 =image protection2; 0x03 =image protection3; |

To set image protection mode:

| Bytes   | describe                                | Bits | illustrate                  |
|---------|-----------------------------------------|------|-----------------------------|
| DATA[0] | 0X28 =set image saver protection status |      | Set image protection status |
| DATA[1] | Image protection status                 |      | 0x00 =close;                |

|  |  |  |                                                                                              |
|--|--|--|----------------------------------------------------------------------------------------------|
|  |  |  | 0x01 =image protection1;<br>0x02 =image protection2;<br>0x03 =image protection3;0x01 =close; |
|--|--|--|----------------------------------------------------------------------------------------------|

## 19.Image Test Setup

Query image test status:

| Bytes   | describe                                   | Bits | illustrate              |
|---------|--------------------------------------------|------|-------------------------|
| DATA[0] | 0X31=Query Image Measurement<br>test state |      | Query image test status |

Return to image protection status:

| Bytes   | describe                        | Bits | illustrate                                                              |
|---------|---------------------------------|------|-------------------------------------------------------------------------|
| DATA[0] | 0X31 =Back to Image Measurement |      | Feedback image test status                                              |
| DATA[1] | test state<br>Image test status |      | 0x00 =close;0x01 =red; 0x02 =green;0x03 =blue; 0x04 =White;0x05 =black; |

To set image protection mode:

| Bytes   | describe                        | Bits | illustrate                                                              |
|---------|---------------------------------|------|-------------------------------------------------------------------------|
| DATA[0] | 0X30 =Set up image measurement  |      | Set image test status                                                   |
| DATA[1] | test state<br>Image test status |      | 0x00 =close;0x01 =red; 0x02 =green;0x03 =blue; 0x04 =White;0x05 =black; |

## 20.On-off timing mode settings

To set the timing mode:

| Bytes   | describe                            | Bits | illustrate                                                                               |
|---------|-------------------------------------|------|------------------------------------------------------------------------------------------|
| DATA[0] | 0X90 =set timer off<br>machine time |      | Set the timer off timer mode                                                             |
| DATA[1] | timer group                         |      | 0x01 =timer one; 0x02 =timer two; 0x03 =timer three; 0x04 =timer four; 0x05 =timer five; |
| DATA[1] | Effective period                    |      | 0x00 =close; 0x01 =Monday; 0x02 =Tuesday; 0x03 =Wednesday; 0x04 =Thursday;               |

|  |  |  |                                                                                           |
|--|--|--|-------------------------------------------------------------------------------------------|
|  |  |  | 0x05 =Friday;<br>0x06 =Monday to Friday; 0x07<br>=Monday to Saturday; 0x08 =every<br>day; |
|--|--|--|-------------------------------------------------------------------------------------------|

Example: Set all screen timer group one, timing mode is "off"

| MsgSize | Control | Group | Data[0] | Data[1] | Data[2] | Checksum |
|---------|---------|-------|---------|---------|---------|----------|
| 07      | 00      | 00    | 90      | 01      | 00      | 95       |

#### twenty one.Timer shutdown time setting

Query the scheduled shutdown time:

| Bytes   | describe                            | Bits | illustrate                                                                                     |
|---------|-------------------------------------|------|------------------------------------------------------------------------------------------------|
| DATA[0] | 0X91=Query time off<br>machine time |      | Query the scheduled shutdown time                                                              |
| DATA[1] | timer group                         |      | 0x01 =timer one; 0x02 =timer<br>two; 0x03 =timer three; 0x04<br>=timer four; 0x05 =timer five; |

Return to the scheduled shutdown time:

| Bytes   | describe                                | Bits | illustrate                                                                                                                                                                          |
|---------|-----------------------------------------|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DATA[0] | 0X91 =Back to timer off<br>machine time |      | Feedback timer shutdown time                                                                                                                                                        |
| DATA[1] | timer group                             |      | 0x01 =timer one; 0x02 =timer<br>two; 0x03 =timer three; 0x04<br>=timer four; 0x05 =timer five;                                                                                      |
| DATA[2] | Effective period                        |      | 0x00 =close;<br>0x01 =Monday;<br>0x02 =Tuesday;<br>0x03 =Wednesday;<br>0x04 =Thursday;<br>0x05 =Friday;<br>0x06 =Monday to Friday; 0x07<br>=Monday to Saturday; 0x08 =every<br>day; |
| DATA[3] | Time                                    |      | The range is0-23                                                                                                                                                                    |

|         |        |  |                  |
|---------|--------|--|------------------|
| DATA[4] | Minute |  | The range is0-59 |
| DATA[5] | second |  | The range is0-59 |

To set the scheduled shutdown time:

|         |                                     |      |                                                                                                |
|---------|-------------------------------------|------|------------------------------------------------------------------------------------------------|
| Bytes   | describe                            | Bits | illustrate                                                                                     |
| DATA[0] | 0X92 =set timer off<br>machine time |      | Set timer shutdown time                                                                        |
| DATA[1] | timer group                         |      | 0x01 =timer one; 0x02 =timer<br>two; 0x03 =timer three; 0x04<br>=timer four; 0x05 =timer five; |
| DATA[2] | Time                                |      | The range is0-23                                                                               |
| DATA[3] | Minute                              |      | The range is0-59                                                                               |
| DATA[4] | second                              |      | The range is0-59                                                                               |

Example: Set timer one for all screens, and the timer shutdown time is:23:00:00

| MsgSize | Control | Group | Data[0] | Data[1] | Data[2] | Data[3] | Data[4] | Checksum |
|---------|---------|-------|---------|---------|---------|---------|---------|----------|
| 09      | 00      | 00    | 92      | 01      | 17      | 00      | 00      | 8C       |

## twenty two.Timing start time setting

Query the scheduled start time:

|         |                                       |      |                                                                                                |
|---------|---------------------------------------|------|------------------------------------------------------------------------------------------------|
| Bytes   | describe                              | Bits | illustrate                                                                                     |
| DATA[0] | 0X93=Query timed open<br>machine time |      | Query the scheduled start time                                                                 |
| DATA[1] | timer group                           |      | 0x01 =timer one; 0x02 =timer<br>two; 0x03 =timer three; 0x04<br>=timer four; 0x05 =timer five; |

Return to the scheduled boot time:

|         |                                         |      |                                                                              |
|---------|-----------------------------------------|------|------------------------------------------------------------------------------|
| Bytes   | describe                                | Bits | illustrate                                                                   |
| DATA[0] | 0X93 =Back to timing on<br>machine time |      | Feedback timing boot time                                                    |
| DATA[1] | timer group                             |      | 0x01 =timer one; 0x02 =timer<br>two; 0x03 =timer three; 0x04<br>=timer four; |

|         |                  |  |                                                                                                                                                                                     |
|---------|------------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|         |                  |  | 0x05 =timer five;                                                                                                                                                                   |
| DATA[2] | Effective period |  | 0x00 =close;<br>0x01 =Monday;<br>0x02 =Tuesday;<br>0x03 =Wednesday;<br>0x04 =Thursday;<br>0x05 =Friday;<br>0x06 =Monday to Friday; 0x07<br>=Monday to Saturday; 0x08 =every<br>day; |
| DATA[3] | Time             |  | The range is0-23                                                                                                                                                                    |
| DATA[4] | Minute           |  | The range is0-59                                                                                                                                                                    |
| DATA[5] | second           |  | The range is0-59                                                                                                                                                                    |

To set the scheduled start time:

| Bytes   | describe                                | Bits | illustrate                                                                                     |
|---------|-----------------------------------------|------|------------------------------------------------------------------------------------------------|
| DATA[0] | 0X94 =Back to timing on<br>machine time |      | Feedback timing boot time                                                                      |
| DATA[1] | timer group                             |      | 0x01 =timer one; 0x02 =timer<br>two; 0x03 =timer three; 0x04<br>=timer four; 0x05 =timer five; |
| DATA[2] | Time                                    |      | The range is0-23                                                                               |
| DATA[3] | Minute                                  |      | The range is0-59                                                                               |
| DATA[4] | second                                  |      | The range is0-59                                                                               |

### twenty three.time setting

Query time status:

| Bytes   | describe                   | Bits | illustrate         |
|---------|----------------------------|------|--------------------|
| DATA[0] | 0X95=query monitor<br>time |      | query monitor time |

Return time status:

| Bytes   | describe                           | Bits | illustrate                                                                    |
|---------|------------------------------------|------|-------------------------------------------------------------------------------|
| DATA[0] | 0X95 =query monitor<br>system time |      | Feedback Monitor System Time                                                  |
| DATA[1] | Year high value                    |      | The two-digit combination represents the year; for<br>example, the high digit |
| DATA[2] | Year low value                     |      | 0x07, the low bit is0XE4, combined as2020                                     |
| DATA[3] | moon                               |      | The range is0x01-0x0C                                                         |

|         |        |  |                       |
|---------|--------|--|-----------------------|
| DATA[4] | day    |  | The range is0x01-0x1F |
| DATA[5] | Time   |  | The range is0x01-0x18 |
| DATA[6] | Minute |  | The range is0x01-0x3B |
| DATA[7] | second |  | The range is0x01-0x3B |

set time:

| Bytes   | describe                         | Bits | illustrate                                                                                                                 |
|---------|----------------------------------|------|----------------------------------------------------------------------------------------------------------------------------|
| DATA[0] | 0X96 =set monitor<br>system time |      | Set monitor system time                                                                                                    |
| DATA[1] | Year high value                  |      | The two-digit combination represents the year; for<br>example, the high digit 0x07, the low bit is0XE4,<br>combined as2020 |
| DATA[2] | Year low value                   |      |                                                                                                                            |
| DATA[3] | moon                             |      | The range is0x01-0x0C                                                                                                      |
| DATA[4] | day                              |      | The range is0x01-0x1F                                                                                                      |
| DATA[5] | Time                             |      | The range is0x01-0x18                                                                                                      |
| DATA[6] | Minute                           |      | The range is0x01-0x3B                                                                                                      |
| DATA[7] | second                           |      | The range is0x01-0x3B                                                                                                      |