# RS232 Control Guide

## About

The document describes how to control your Hisense digital signage displays via RS232 from a computer. Follow the procedures to complete the connection and settings first, and refer to the command table for RS232 commands.

*Available functions and commands vary by model. Check the specifications and user manual of the purchased display for product functions.*

## Command Structure

Please read the following key points before starting the connection:

1. **HEX Code Format**: The RS232 commands for HISENSE displays are in HEX format, not ASCII. This means the commands are expressed in hexadecimal numbers.
2. **Device ID in Commands**: Each command includes an ID that specifies which screen or device the command is meant for. Using "00" as the ID will broadcast the command to all connected devices on the RS232 port. If a specific ID like "01" is used, only the device with that ID will respond to the command.
3. **No Response for Mismatched IDs**: If the ID in the command does not match the device's ID, there will be no feedback, and the command will not work. This ensures that each device only responds to commands intended for it.
4. **Device ID Configuration**: The default ID for HISENSE displays is "01". When setting up multiple devices in a video wall configuration, each device must have a unique ID to avoid conflicts.

5. **Compatibility and Software Version**: Some commands might not work depending on the device's current configuration or software version. If there are issues with commands not working, updating the device software to the latest version is recommended.
6. **Checksum Calculation with XOR**: Certain RS232 commands require a checksum byte, which is calculated using an XOR operation on some of the HEX bytes in the command. You can use an online XOR calculator, such as the one provided in your message, to perform these calculations. To calculate the checksum:
   a. Enter each HEX byte that needs to be XORed into the left-hand box, each on a separate line.
   b. The result of the XOR operation, which is the checksum byte, will appear in the right-hand box.

## Understanding the Command Structure

To understand in details about Hisense display RS232 command structure, let's see the breakdown as described below:

1. **Length**: The number of bytes that make up the Command, Data, and Checksum. This is a single byte that represents the total length.
2. **Command**: This is the specific command you're sending to the HISENSE device. The command byte dictates the action you want the device to perform (e.g., power on/off, change input, etc.).
3. **Monitor ID**: This specifies which device or screen the command is intended for. "00" will broadcast to all devices, while specific IDs (like "01") target individual devices.
4. **Data**: This section contains any additional information needed for the command, such as volume level or channel number.

5. **Checksum**: A single byte that is the result of an XOR operation applied to the Length, Command, Monitor ID, and Data bytes. The checksum ensures the integrity of the command data.

## Constructing a Command

Here's how you can construct a command step-by-step:

1. **Determine the Length**:
   - The length byte is the total number of bytes for the Command, Monitor ID, Data, and Checksum.
   - If your command includes a command byte, a monitor ID, and two data bytes, and a checksum byte, the total length is 5. You will then represent this as 05 in HEX.
2. **Select the Command Byte**:
   - Identify the specific command you need to send. For example, let's assume the command byte for "Power On" is 0x01.
3. **Specify the Monitor ID**:
   - Use 00 for all devices or the specific ID of the device (e.g., 01).
4. **Prepare the Data Bytes**:
   - Data bytes are additional information that some commands require. For instance, if the command changes the volume, the data bytes might represent the volume level.
5. **Calculate the Checksum**:
   - The checksum is calculated using the XOR operation on all preceding bytes (Length, Command, Monitor ID, and Data).

## Example Command Construction

Let's create an example command to illustrate these steps:

Example: Power On Command to Monitor ID 01 without Additional Data

1. **Command Structure:**
    a. **Length**: 04 (since we have the Length itself, Command, Monitor ID, and Checksum)
    b. **Command**: 0x01 (Power On)
    c. **Monitor ID**: 0x01 (specific to the first monitor)
    d. **Data**: None
    e. **Checksum**: Calculated by XORing Length, Command, Monitor ID, and Data.
2. **Calculate the Checksum:**
    a. XOR Calculation: Length XOR Command XOR Monitor ID
    b. In this case: 04 XOR 01 XOR 01

    Let's calculate it step-by-step:

    a. Length = 0x04
    b. Command = 0x01
    c. Monitor ID = 0x01
    d. Data = (None in this case)
    e. Checksum = Length XOR Command XOR Monitor ID
    f. Checksum = 0x04 XOR 0x01 XOR 0x01
        - 0x04 XOR 0x01 = 0x05
        - 0x05 XOR 0x01 = 0x04

    Thus, the **Checksum** byte is 0x04.
3. **Final Command:**

    Putting it all together:

    a. **Length**: 0x04
    b. **Command**: 0x01 (Power On)
    c. **Monitor ID**: 0x01
    d. **Checksum**: 0x04

The command sequence to send over RS232 would be: 04 01 01 04

## Using Online XOR Calculator

To use an online XOR calculator like the one mentioned earlier:

1. Enter each of the bytes (in HEX) that need to be XORed into the left-hand box, each on a new line:
   04
   01
   01
2. The right-hand box will display the XOR result, which should be 04.

## Additional Tips

1. **Double-Check**: Always verify the command format and byte values according to the device manual.
2. **Test with Simple Commands**: Start with simple commands (like power on/off) to verify communication before sending more complex commands.
3. **Monitor Feedback**: Check the response from the device to ensure the command was correctly received and executed.

## Tools

To set up your PC for sending RS232 commands to HISENSE displays, you will need to install a USB-to-Serial Bridge Driver and RS232 serial terminal software. Here's a step-by-step guide:

1. **Install a USB-to-Serial Bridge Driver**
   If your PC does not have a built-in serial port, you'll need a USB-to-Serial adapter. When you plug in the adapter, your operating system might automatically detect it and install the necessary drivers. If not, you'll need to manually install the driver provided by the manufacturer. Here's how you can do it:

a. **Identify the Manufacturer**: Most USB-to-Serial adapters come with a specific chip (e.g., FTDI, Prolific, Silicon Labs). Check the adapter or its packaging for this information.
b. **Download the Driver**: Visit the manufacturer's website and download the appropriate driver for your operating system (Windows, macOS, or Linux).
c. **Install the Driver**: Run the installer and follow the on-screen instructions to install the driver. This process will create a virtual COM port on your PC, which you will use to communicate with the RS232 device.

2. **Install RS232 Serial Terminal Software**

To communicate with your HISENSE displays over RS232, you need terminal software that allows you to send HEX commands. Two popular options are **Hercules SETUP utility** and **SSCOM**.

**Option A: Hercules SETUP Utility**

Hercules SETUP utility is a versatile tool for serial communication and network testing. Here's how to install and use it:

a. **Download Hercules SETUP Utility**:
   - Go to the Hercules SETUP utility website or search for it online.
   - Download the latest version compatible with your operating system.
b. **Install Hercules**:
   - Run the downloaded installer and follow the installation prompts.
c. **Configure Hercules for RS232 Communication**:
   - Open Hercules after installation.
   - Navigate to the "Serial" tab.
   - Select the COM port created by your USB-to-Serial adapter.
   - Set the correct baud rate, data bits, parity, stop bits, and flow control settings as specified by the HISENSE display manual.

- Ensure the HEX display and input options are selected so you can send and view HEX codes.

Option B: SSCOM

SSCOM is another simple and effective terminal program for RS232 communication:

a. Download SSCOM:
   - Search for SSCOM software online and download it from a trusted source.

b. Install SSCOM:
   - Extract the downloaded ZIP file and run the SSCOM executable (SSCOM typically does not require installation).

c. Configure SSCOM:
   - Choose the COM port corresponding to your USB-to-Serial adapter.
   - Set the communication parameters (baud rate, data bits, parity, stop bits, flow control) as needed.
   - Ensure you select the HEX mode for sending and receiving commands.

3. Send RS232 Commands

Once you have your driver and terminal software installed and configured:

Connect Your HISENSE display: Plug the RS232 cable into the USB-to-Serial adapter connected to your PC.

Send Commands: Using the terminal software (Hercules or SSCOM), enter the HEX command you want to send and press "Send" or "Transmit." Make sure to include the correct checksum byte if required.

4. Verify Communication

- Troubleshoot: If the device doesn't respond, double-check the device ID, the command format, and all settings (baud rate, parity, etc.). Also, consider updating the device's firmware or software if communication issues persist.

Following these steps should help you set up your PC for RS232 communication with HISENSE displays. If you need further assistance or have any specific questions, feel free to reach out to our support team by click here!

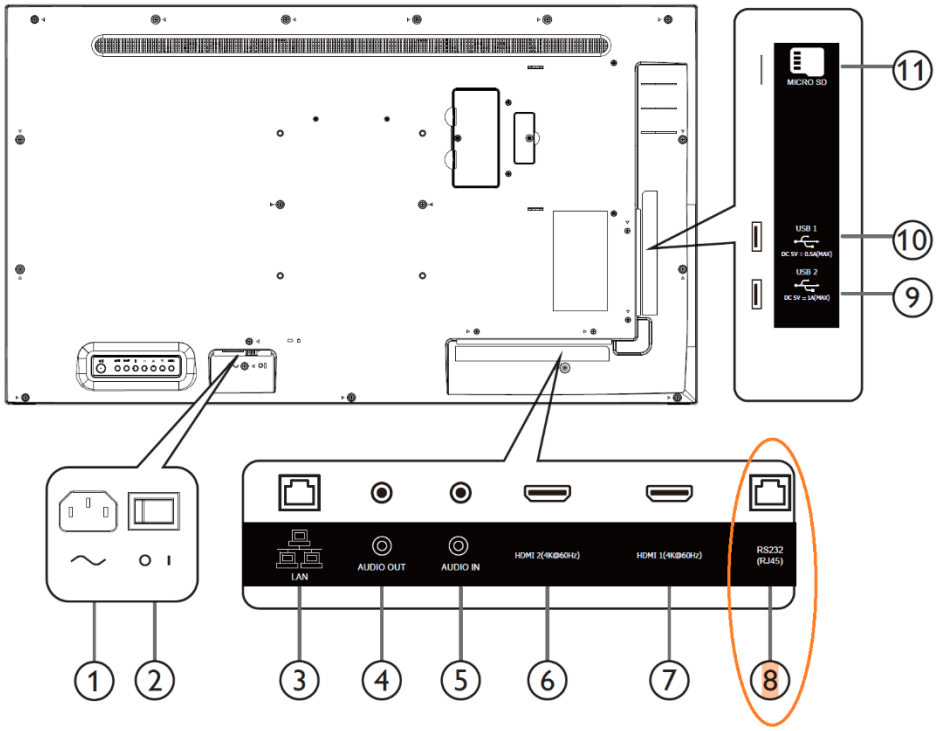
## Digital Signage – E Series

| Product Series | Android | Product Model | Firmware Version |
|---|---|---|---|
| E | 8.0 | 43B4E31T | FBV02.03 |
| | | 55B4E31T | FBV01.08 |
| | | 65B4E31T | FBV02.04 |
| | | 75B4E30T (A000) | FBV02.06 |
| | | 86B4E30T | FBV01.08 |

### Connecting to the Display

Instructions on how to connect the RS232 cable between the Hisense digital signage – E series and the controlling device. Include diagrams of RS232 pin configuration and types of connections. Specify recommended cable types and lengths.

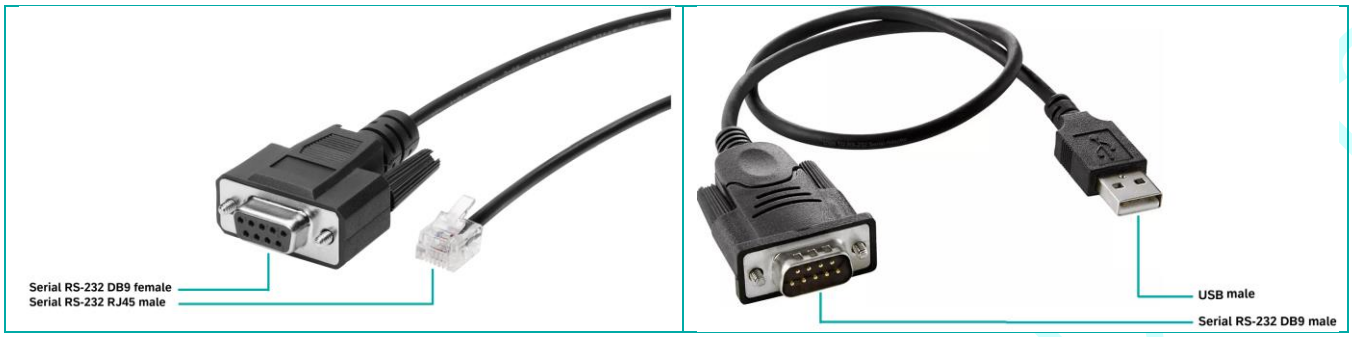
## RS232 Port



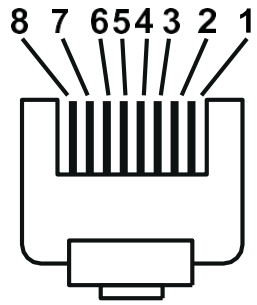
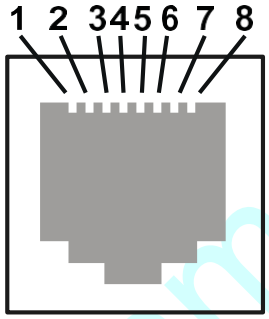

## Connectors

Choose the appropriate cable for using RS232 connections, you need to consider several factors related to the product model and its specific requirements. Here are some example for the connectors which might be required. Check the content of the product to validate whether the cable is included. Prepare the necessary cables in advance to ensure that the connection of RS232 can be communicated.

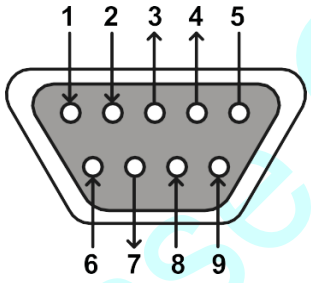
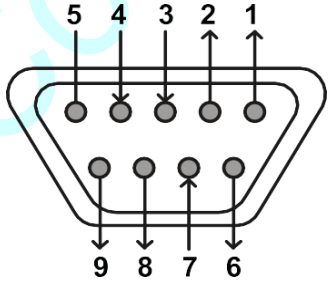
| RS232 DB9 female to RJ45 male cable | RS232 DB9 male to USB male cable |
|---|---|




## Pin Configuration

| RJ45 Male | RJ45 Female | Pin | Signal |
|---|---|---|---|
|  |  | 1 | |
| | | 2 | |
| | | 3 | |
| | | 4 | GND |
| | | 5 | RX |
| | | 6 | |
| | | 7 | TX |
| | | 8 | |



| DB9 Male | DB9 Female | Pin | Signal |
|---|---|---|---|
|  |  | 1 | |
| | | 2 | RX |
| | | 3 | TX |
| | | 4 | |
| | | 5 | GND |
| | | 6 | |
| | | 7 | |
| | | 8 | |

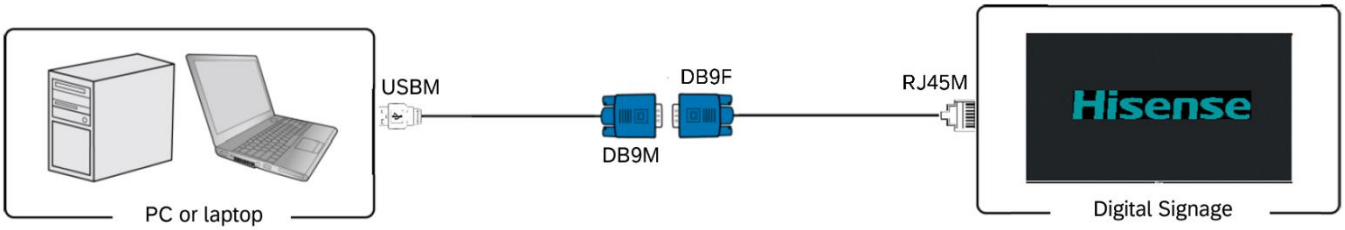


## Wiring Arrangement

| Pinout Connection | |
|---|---|
| RJ45 | DB9 |
| 1 | |
| 2 | |

| | |
|---|---|
| 3 | |
| 4 | 5 |
| 5 | 3 |
| 6 | |
| 7 | 2 |
| 8 | |

## Connection Diagram




## RS232 Communication Settings

| Parameters | Value |
|---|---|
| Baud Rate | 115200 |
| Data Bits | 8 |
| Parity | none |
| Stop Bits | 1 |
| Flow Control | none |

## Command Protocols

This sections outlines the structure and format of commands to be sent to the display. It provides a list of commands and codes for various functions such as power, input selection, volume control, brightness adjustment, and status inquiries.

### Command String

**PC to Display**

This section defines the command string while sending it from a PC to a Hisense display. You can find the byte indication for each string:

| Header | Monitor ID | Category | Code 0 | Code 1 | Length | Data Control | Command | Checksum |
|---|---|---|---|---|---|---|---|---|
| 1 byte | 1 byte | 1 byte | 1 byte | 1 byte | 1 byte | 1 byte | Empty or Data[0] - Data[N]<br>N is 0-36 | 1 byte |

You can find the detailed description for each string:

| Number of Field | Name of Field | Description |
|---|---|---|
| Byte 1 | Header | Header=0xA6 |
| Byte 2 | Monitor ID | Monitor ID range: 0x01 - 0xFF |
| Byte 3 | Category | Category = 0x00 (fixed) |
| Byte 4 | Code 0 | Code 0 = 0x00 (fixed) |
| Byte 5 | Code 1 | Code 1 = 0x00 (fixed) |
| Byte 6 | Length | Length = N + 3, where N is value in field Command "Data[N]" |
| Byte 7 | Data Control | Data Control = 0x01 (fixed) |
| Byte 8 - Byte 44 | Command | Data[0] - Data[N]<br>This field can be empty, if it is not empty, the range of N is: 0 - 36 |
| Last Byte | Checksum | All bytes except last byte calculated by XOR |

### Display to PC

This section defines the response string from a display to a host controller, after the host controller sends a command, typically serves as an acknowledgment or status report.

*There is no response message from the PC when the wrong ID address is being used.*

You can find the byte indication for each string:

| Header | Monitor ID | Category | Code 0 | Length | Data Control | Command | Result | Checksum |
|---|---|---|---|---|---|---|---|---|
| 1 byte | 1 byte | 1 byte | 1 byte | 1 byte | 1 byte | 1 byte | Data[0] - Data[N] N is 0-36 | 1 byte |

You can find the detailed description for each string:

| Number of Field | Name of Field | Description |
|---|---|---|
| Byte 1 | Header | Header=0x21 |

| | | |
|---|---|---|
| Byte 2 | Monitor ID | Monitor ID range: 0x01 - 0xFF |
| Byte 3 | Category | Category = 0x00 (fixed) |
| Byte 4 | Code 0 | Code 0 = 0x00 (fixed) |
| Byte 5 | Length | For feedback of "set" command, length = 0x04<br>For feedback of "get" command, length is the number of rest bytes in this message |
| Byte 6 | Data Control | Data Control = 0x01 (fixed) |
| Byte 7 | Command | For feedback of "set" command, 0x00 (fixed)<br>For feedback of "get" command, it is same as the Data[0] of command in message PC-> TV |
| Byte 8-N | Result | Data[0] - Data[N], the range of N is: 0 - 36 For feedback of "set" command:<br>1. 0x00: Completed, normal response.<br>2. 0x01: Limit Over, the packet was received normally, but the data value was over the upper limit.<br>3. 0x02: Limit Over, the packet was received normally, but the data value was over the lower limit.<br>4. 0x03: Command cancelled, the packet is received normally but either the value of data is incorrect, or the request is not permitted for the current host.<br>5. 0x04: Parse Error, received not defined format data or checksum error.<br>For feedback of "get" command, the result depends on Data[1]-Data[N] in "get" command. |
| Last Byte | Checksum | All bytes except last byte calculated by XOR |

## Command Table

| Name | Set | Get | Code | Example (PC -> TV) | Example (TV -> PC) | Note |
|---|---|---|---|---|---|---|
| Set Volume | √ | | 0x44 | 0xA6 0x01 0x00 0x00 0x00 0x04 0x01 0x44 data[1] Checksum<br>data[1]: Volume (0-100)<br>ex: set volume to 77<br>A60100000000401444DAB | 210100000401000025 | RS232 |
| Get Volume | | √ | 0x45 | A60100000000030145E0 | Current volume is 77<br>210100000401454D2D | RS232 |
| Set Video Params | √ | | 0x32 | 0xA6 0x01 0x00 0x00 0x00 0x0A 0x01 0x32 data[1] data[2] data[3] data[4] data[5] data[6] data[7] checksum data[1]: PICMODE In OSD<br>data[2]: Brightness in OSD (0-100), data[3]: Contrast (0-100)<br>data[4]: Colour Temperature (0-normal /1-cool/2-warm) data[5]: Overscan(0-close/1-open)<br>data[6]: PCMode(0-Auto/1-PC/2-video)<br><br>PICMODE:<br>HI_MW_PICMODE_USER = 3, | 210100000401000025 | RS232 |

<table>
<tr><th>Name</th><th>Set</th><th>Get</th><th>Code</th><th>Example (PC -> TV)</th><th>Example (TV -> PC)</th><th>Note</th></tr>
<tr><td></td><td></td><td></td><td></td><td>HI_MW_PICMODE_AIRPORT = 7,<br>HI_MW_PICMODE_HOTEL = 8,<br>HI_MW_PICMODE_DINING = 9,<br>HI_MW_PICMODE_SECURITY = 10,<br>HI_MW_PICMODE_OFFICE = 11,<br>HI_MW_PICMODE_OUTDOOR = 12<br><br>ex: PICMODE is user, brightness 32, contrast 32, cool, overscan on, PC A601000000090132032020010101 9F</td><td></td><td></td></tr>
<tr><td>Get Video Params</td><td></td><td>√</td><td>0x33</td><td>A60100000003013396</td><td>PICMODE is user, brightness 32, contrast 32, cool, overscan on, PC 210100000A013303202001010<br>11a</td><td>RS232</td></tr>
<tr><td>Set Sound Mode and Balance</td><td>√</td><td></td><td>0x42</td><td>0xA6 0x01 0x00 0x00 0x00 0x05 0x01 0x42 data[1] data[2] checksum<br>data[1]: STANDARD - 0x00 NEWS - 0x01 MUSIC - 0x02 MOVIE - 0x03<br>data[2]: balance value - OSD value is -50 to 50, corresponding value here is from 0 to 100<br>ex: STANDARD, balance value is -50<br>A6010000000501420000E1</td><td>210100000401000025</td><td>RS232</td></tr>
<tr><td>Get Sound Mode and Balance</td><td></td><td>√</td><td>0x43</td><td>A601000000030143E6</td><td>Current mode is STANDARD, balance value is -50<br>21010000050143000067</td><td>RS232</td></tr>
<tr><td>Set Key (simulate Remote Controller Key)</td><td>√</td><td></td><td>0xB0</td><td>0xA6 0x01 0x00 0x00 0x00 0x05 0x01 0xB0 data[1] data[2] checksum<br>data[1]: IR Key(High) data[2]: IR Key(low)
<table>
<tr><th>Key</th><th>Key Value</th></tr>
<tr><td>Power</td><td>0x74</td></tr>
<tr><td>Setting</td><td>0xFD</td></tr>
<tr><td>Up</td><td>0x67</td></tr>
<tr><td>Down</td><td>0x6C</td></tr>
<tr><td>OK</td><td>0x1C</td></tr>
<tr><td>RIGHT</td><td>0x6A</td></tr>
<tr><td>LEFT</td><td>0x69</td></tr>
<tr><td>Home</td><td>0x66</td></tr>
<tr><td>Vol+</td><td>0x73</td></tr>
</table></td><td>210100000401000025</td><td>RS232</td></tr>
</table>

| Name | Set | Get | Code | Example (PC -> TV) | Example (TV -> PC) | Note |
|---|---|---|---|---|---|---|
| | | | | Vol- 0x72<br>Return 0x9E<br>Source 0xFA<br><br>eg: set volume to 0 - mute A60100000000501B0007162 | | |
| Set Input Source | ✓ | | 0xAC | 0xA6 0x01 0x00 0x00 0x00 0x04 0x01 0xAC data[1] checksum<br>data[1]:HDMI1-0x0D HDMI2-0x06 CMS-0x15 Media-0x16 Custom-0x18 (available only when set in Setting menu) USB-0x0C<br>Eg: change source to HDMI1 A6010000000401AC0D03 | 210100000401000025 | RS232 |
| Get Input Source | | ✓ | 0xAD | A60100000000301AD08 | Current source is HDMI1<br>2101000000401AD0D85 | RS232 |
| Set Power on/off | ✓ | | 0x18 | 0xA6 0x01 0x00 0x00 0x00 0x04 0x01 0x18 data[1] checksum<br>data[1]: Power off -0x01 Power On - 0x02<br>eg:<br>A60100000004011801BB power off<br>A60100000004011802B8 power on | 210100000401000025 | RS232<br>"Uart Wake" must set to "On" |
| Get Power On/Off state | | ✓ | 0x19 | A601000000030119BC | Current state is on<br>21010000040119023E | RS232<br>"Uart Wake" must set to "On" |
| Set Power On mode | ✓ | | 0xA3 | Power on mode:<br>0: Standby 1<br>: Power On 2<br>: Last status<br>ex: A6010000000401A30001 set power on mode to "Standby" | 210100000401000025 | RS232 |

## Digital Signage – BM/GM/DM/GM50D Series

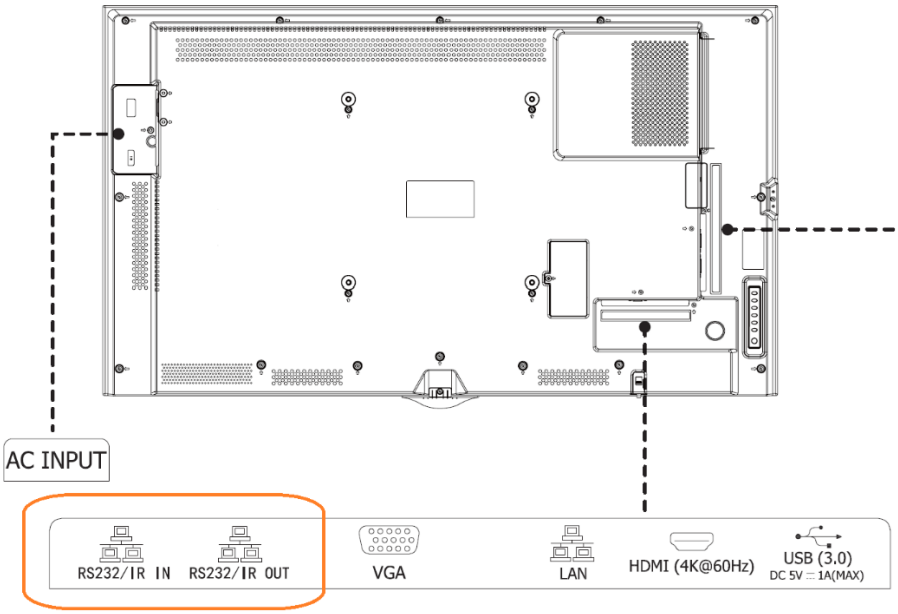
| Product Series | Android | Product Model | Firmware Version |
|---|---|---|---|
| BM | 9.0 | 32BM66AE | N1027 |
| | | 43BM66AE | N1027 |
| | | 43BM66AE (A000) | N1027 |
| | | 49BM66AE (A000) | N1027 |
| | | 55BM66AE (A000) | N1027 |

| | | | |
|---|---|---|---|
| | | 65BM66D | N0609 |
| | | 100BM66D | N0512 |
| GM | 9.0 | 50GM60AE | M0804 |
| | | 55GM60AE | M0804 |
| | | 65GM60AE | M0804 |
| DM | 11.0 | 32DM66D | V1.1.0.2-2024021152738 |
| | | 43DM66D | V1.1.0.2-2024021152738 |
| | | 50DM66D | V1.1.0.2-2024021152738 |
| | | 50DM66E | V1.1.0.2-2024021152738 |
| | | 65DM66D | V1.1.0.2-2024021152738 |
| | | 75DM66D | V1.1.0.2-2024021152738 |
| | | 86DM66D | V1.1.0.2-2024021152738 |
| GM50D | 11.0 | 50GM50D | V1.1.0.2-2024021152738 |
| | | 55GM50D | V1.1.0.2-2024021152738 |
| | | 65GM50D | V1.1.0.2-2024021152738 |
| | | 75GM50D | V1.1.0.2-2024021152738 |
| | | 86GM50D | V1.1.0.2-2024021152738 |

## Connecting to the Display

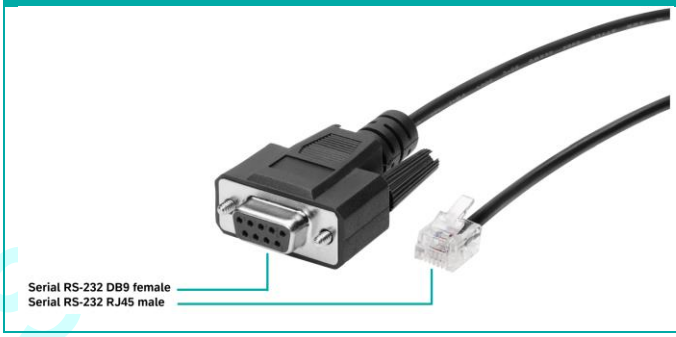
Instructions on how to connect the RS232 cable between the Hisense digital signage – M/G series and the controlling device. Include diagrams of RS232 pin configuration and types of connections. Specify recommended cable types and lengths.

## RS232 Port

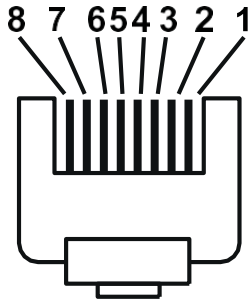
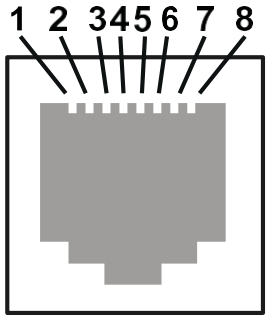


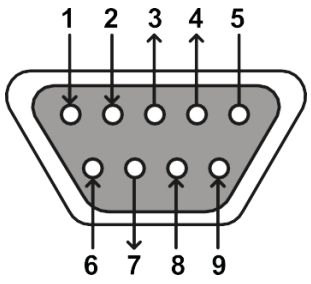
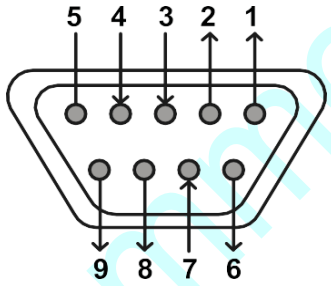

## Connectors

Choose the appropriate cable for using RS232 connections, you need to consider several factors related to the product model and its specific requirements. Here are some example for the connectors which might be required. Check the content of the product to validate whether the cable is included. Prepare the necessary cables in advance to ensure that the connection of RS232 can be communicated.

| RS232 DB9 female to RJ45 male cable | RS232 DB9 male to USB male cable |
|---|---|
|  |  |

## Pin Configuration

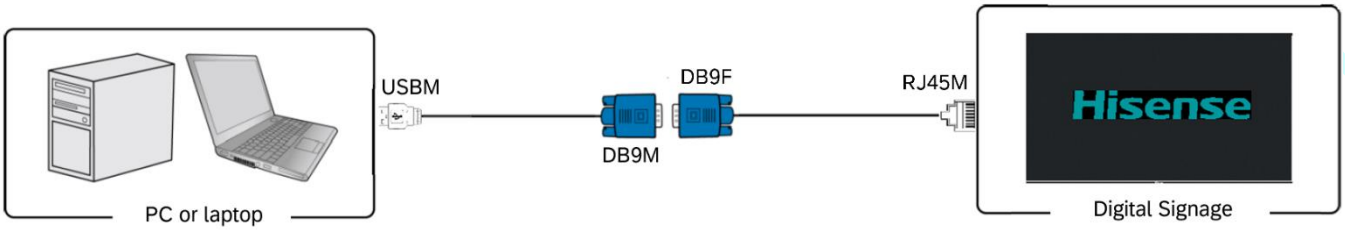
| RJ45 Male | RJ45 Female | Pin | Signal |
|---|---|---|---|
|  |  | 1 | |
| | | 2 | |
| | | 3 | GND |
| | | 4 | |
| | | 5 | RX |
| | | 6 | |
| | | 7 | |
| | | 8 | TX |

| RJ45 Male | RJ45 Female | Pin | Signal |
|---|---|---|---|
|  |  | 1 | |
| | | 2 | RX |
| | | 3 | TX |
| | | 4 | |
| | | 5 | GND |
| | | 6 | |
| | | 7 | |
| | | 8 | |

## Wiring Arrangement

| Pinout Connection | |
|---|---|
| RJ45 | DB9F |
| 1 | |
| 2 | |
| 3 | 5 |
| 4 | |
| 5 | 3 |
| 6 | |
| 7 | |
| 8 | 2 |

### Connection Diagram




## RS232 Communication Settings

| Parameters | Value |
|---|---|
| Baud Rate | 9600 |
| Data Bits | 8 |
| Parity | none |
| Stop Bits | 1 |
| Flow Control | none |

## Command Protocols

This sections outlines the structure and format of commands to be sent to the display. It provides a list of commands and codes for various functions such as power, input selection, volume control, brightness adjustment, and status inquiries.

### Command String

**PC to Display**

This section defines the command string while sending it from a PC (host controller) to a Hisense display.

You can find the byte indication for each string:

| Header (2 Bytes) | | Length (2 Bytes) | | Command (4 Bytes) | | | | Monitor ID (1 Byte) | Data (N Bytes) | | | Checksum (1 Bytes) | End (2 Bytes) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DD | FF | | | | | | | | | | | | BB | CC |

**Display to PC**

This section defines the response string from a display to a host controller, after the

host controller sends a command, typically serves as an acknowledgment or status report.

*There is no response message from the PC when the wrong ID address is being used.*

You can find the byte indication for each string:

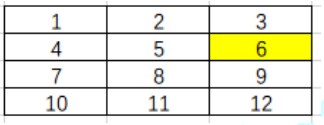
| Header (2 Bytes) | | Length (2 Bytes) | | Command (4 Bytes) | | | | Monitor ID (1 Byte) | Data (N Bytes) | | | Checksum (1 Bytes) | End (2 Bytes) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AB | AB | | | | | | | | | | | | CD | CD |

## Command Table

| Description | Command (HEX Bytes) | Example (PC -> TV ID 01) | TV -> PC |
|---|---|---|---|
| Power On | DD FF 00 08 C1 15 00 00 xx BB BB yy BB CC | DDFF0008C115000001BBBBDDBB CC | AB AB 00 08 C1 15 00 00 xx BB BB yy CD CD<br><br>When TV is in standby sate, send this command will get one feedback from TV, once TV starts up, it will send feedback again. |
| Power Off | DD FF 00 08 C1 15 00 00 xx AA AA yy BB CC | DDFF0008C115000001AAAADDBB CC | AB AB 00 08 C1 15 00 00 xx AA AA yy CD CD |
| Screen Off | DD FF 00 07 C1 31 00 00 xx 00 yy BB CC | DDFF0007C13100000100F6BBCC | AB AB 00 07 C1 31 00 00 xx 00 yy CD CD |
| Screen On | DD FF 00 07 C1 31 00 00 xx 01 yy BB CC | DDFF0007C13100000101F7BBCC | AB AB 00 07 C1 31 00 00 xx 01 yy CD CD |
| Reboot | DD FF 00 06 C1 1E 00 00 xx yy BB CC | DDFF0006C11E000001D8BBCC | AB AB 00 06 C1 1E 00 00 xx yy CD CD |
| Set AC Power On Mode | DD FF 00 07 C1 FF 00 09 xx zz yy BB CC | DDFF0007C1FF0009010031BBCC | AB AB 00 07 C1 FF 00 09 xx zz yy CD CD |
| DP Input | DD FF 00 07 C1 08 00 00 xx 16 yy BB CC | DDFF0007C10800000116D9BBCC | AB AB 00 07 C1 08 00 00 xx 16 yy CD CD |
| VGA Input | DD FF 00 07 C1 08 00 00 xx 17 yy BB CC | DDFF0007C10800000117D8BBCC | AB AB 00 07 C1 08 00 00 xx 17 yy CD CD |
| HDMI1 Input | DD FF 00 07 C1 08 00 00 xx 0E yy BB CC | DDFF0007C1080000010EC1BBCC | AB AB 00 07 C1 08 00 00 xx 0E yy CD CD |
| HDMI2 Input | DD FF 00 07 C1 08 00 00 xx 0F yy BB CC | DDFF0007C1080000010FC0BBCC | AB AB 00 07 C1 08 00 00 xx 0F yy CD CD |
| PC Input | DD FF 00 07 C1 08 00 00 xx 0C yy BB CC | DDFF0007C1080000010CC3BBCC | AB AB 00 07 C1 08 00 00 xx 0C yy CD CD |
| DVI Input | DD FF 00 07 C1 08 00 00 xx 09 yy BB CC | DDFF0007C10800000109C6BBCC | AB AB 00 07 C1 08 00 00 xx 09 yy CD CD |
| Set Screen Aspect Ratio | DD FF 00 07 C1 35 00 00 xx zz yy BB CC | ex: set screep ratio 90 degrees DDFF0007C13500000109FBBBCC | AB AB 00 07 C1 35 00 00 xx zz yy CD CD |

| Description | Command (HEX Bytes) | Example (PC -> TV ID 01) | TV -> PC |
|---|---|---|---|
| | Once this command is set, reboot TV, it will show with expected ratio | zz = 00 - 0 degree, 01 - 90 degree | |
| Set Mute | DD FF 00 07 C1 26 00 00 xx 01 yy BB CC | DDFF0007C12600000101E0BBCC | AB AB 00 07 C1 26 00 00 xx 01 yy CD CD |
| Set Unmute | DD FF 00 07 C1 26 00 00 xx 00 yy BB CC | DDFF0007C12600000100E1BBCC | AB AB 00 07 C1 26 00 00 xx 00 yy CD CD |
| Set Volume | DD FF 00 07 C1 27 00 00 xx zz yy BB CC | DDFF0007C12700000101E1BBCC<br>zz: volume range 0-100 | AB AB 00 07 C1 27 00 00 xx zz yy CD CD |
| Set Backlight Brightness | DD FF 00 08 C1 32 00 00 xx 06 zz yy BB CC | ex: set brightness to 32 - zz = 0x20<br>DDFF0008C1320000010620DCB BCC | AB AB 00 08 C1 32 00 00 xx 06 zz CD CD |
| Set Backlight Brightness Auto Adjust | DD FF 00 07 C1 34 00 00 xx zz yy BB CC | ex: set brightness auto adust on<br>DDFF0007C13400000100F3BBC C<br>zz = 00 - on, 01 - off | AB AB 00 07 C1 34 00 00 xx zz yy CD CD |
| Set Date | DD FF 00 09 C1 1C 00 00 xx zz zz zz yy BB CC | ex: set date to 23.Jan.2<br>DDFF0009C11C000001170102C1B BCC<br>zz zz zz = Year Month Day | AB AB 00 09 C1 1C 00 00 xx zz zz zz yy CD CD<br>zz zz zz = FF FF FF when error |
| Set Time | DD FF 00 09 C1 1D 00 00 xx zz zz zz yy BB CC | ex: set time to 12:25:2<br>DDFF0009C11D0000010C1902C3 BBCC<br>zz zz zz = Hour Minute Second | AB AB 00 09 C1 1D 00 00 xx zz zz zz yy CD CD<br>zz zz zz = FF FF FF when error |
| Set Schedule for Power On | DD FF 00 09 C1 3E 00 00 xx tt zz zz yy BB CC | ex: power on at 9:10 every day<br>DDFF0009C13E00000101090AF5 BBCC<br>tt = 00 - turn off schedule, 01 - everyday<br>zz zz = Hour Minute | AB AB 00 09 C1 3E 00 00 xx zz zz zz yy CD CD |
| Set Schedule for Power Off | DD FF 00 09 C1 3F 00 00 xx tt zz zz yy BB CC | ex: power off at 18:10 every day<br>DDFF0009C13F00000101120AEFB BCC<br>tt = 0 - turn off schedule, 1 - everyday<br>zz zz = Hour Minute | AB AB 00 09 C1 3F 00 00 xx zz zz zz yy CD CD |
| Set Brightness | DD FF 00 07 C1 36 00 00 xx zz yy BB CC<br><br>current source must be: DP, VGA, HDMI, PC, DVI | ex: set brightness to 32 - zz = 0x20<br>DDFF0007C13600000120D1BBCC | AB AB 00 07 C1 36 00 00 xx zz yy CD CD |
| Set Contrast | DD FF 00 07 C1 37 00 00 xx zz yy BB CC<br><br>current source must be: DP, VGA, HDMI, PC, DVI | ex: set contrast to 32 - zz = 0x20<br>DDFF0007C13700000120D0BBC C | AB AB 00 07 C1 37 00 00 xx zz yy CD CD |

| Description | Command (HEX Bytes) | Example (PC -> TV ID 01) | TV -> PC |
|---|---|---|---|
| Set Sharpness | DD FF 00 07 C1 38 00 00 xx zz yy BB CC<br><br>current source must be: DP, VGA, HDMI, PC, DVI | ex: set sharpness to 32 - zz = 0x20<br>DDFF0007C13800000120DFBBCC | AB AB 00 07 C1 38 00 00 xx zz yy CD CD |
| Set Color Temperature | DD FF 00 07 C1 39 00 00 xx zz yy BB CC<br><br>current source must be: DP, VGA, HDMI, PC, DVI | ex: set colour temperature to 32 - zz = 0x20<br>DDFF0007C13900000120DEBBCC | AB AB 00 07 C1 39 00 00 xx zz yy CD CD |
| Set Noise Reduction | DD FF 00 07 C1 3A 00 00 xx zz yy BB CC<br><br>current source must be: DP, VGA, HDMI, PC, DVI | ex: set noise reduction to High - zz = 0x03<br>DDFF0007C13A00000103FEBBCC<br>zz = 01 - low, 02 - medium, 03 - high, 04 - auto, 00 – off | AB AB 00 07 C1 3A 00 00 xx zz yy CD CD |
| Set Image Scaling | DD FF 00 07 C1 3B 00 00 xx zz yy BB CC<br><br>current source must be: DP, VGA, HDMI, PC, DVI | ex: set image scaling to Full - zz = 0x03<br>DDFF0007C13B00000103FFBBCC<br>zz = 00 - full, 01 - 16:9, 02 - 4:3, 03 - scaling 1, 04 - scaling 2, 05 - point to point | AB AB 00 07 C1 3B 00 00 xx zz yy CD CD |
| Set Picture Mode | DD FF 00 07 C1 0F 06 00 xx zz yy BB CC | ex: set picture mode to movie mode - zz = 0x03<br>DDFF0007C10F060001030CBBCC<br>zz = 00 - standard, 01 - bright, 02 - soft, 03 - Movie, 04 - Text, 5 - gaming 12 – natural | AB AB 00 07 C1 0F 06 00 xx zz yy CD CD |
| Set Sound Mode | DD FF 00 07 C1 FF 00 03 xx zz yy BB CC | ex: set sound mode to standard mode - zz = 0x00<br>DDFF0007C1FF000301003BBBCC<br>zz = 00 - standard，01 - music, 02 - news, 08 - movie, 10 - sports，20 - custom, 30 - voice, 40 - meeting | AB AB 00 07 C1 FF 00 03 xx zz yy CD CD |
| Set Eye Protection Mode | DD FF 00 07 C1 FF 00 1E xx zz yy BB CC | ex: set eye protection mode on - zz = 0x01<br>DDFF0007C1FF001E010127BBCC<br>zz = 00 - off, 01 - on | AB AB 00 07 C1 FF 00 1E xx zz yy CD CD |
| VGA Auto Adjust | DD FF 00 07 C1 01 00 00 xx yy BB CC<br>current source must be VGA | ex: VGA Auto Adjust<br>DDFF0007C101000001C6BBCC<br>zz = 00 - off, 01 – on | AB AB 00 07 C1 01 00 00 xx yy CD CD |
| Set anti-burn-in (image retention) | DD FF 00 07 C1 33 00 00 xx zz yy BB CC | ex: set anti-burn-in on<br>DDFF0007C13300000101F4BBCC<br>zz = 00 - off, 01 - on | AB AB 00 07 C1 33 00 00 xx zz yy CD CD |
| Set Power on delay | DD FF 00 07 C1 3C 00 00 xx zz yy BB CC | ex: set power on delay to 10s<br>DDFF0007C13C0000010AF1BBCC<br>zz = 00 - off, others - delay time, range: 2s - 255s | AB AB 00 07 C1 3C 00 00 xx zz yy CD CD |

| Description | Command (HEX Bytes) | Example (PC -> TV ID 01) | TV -> PC |
|---|---|---|---|
| Set Video Wall | DD FF 00 09 C1 0A 00 00 xx zz zz zz yy BB CC | ex: vertical 3 devices, horizontal 4 devices, device position: 6<br>DDFF0009C10A000001030406C2BBCC<br>zz: how many devices in vertical<br>zz: how many devices in horizontal<br>zz: current device position | AB AB 00 09 C1 0A 00 00 xx zz zz zz yy CD CD<br>  <br> |
| Set Static IP Address of LAN | DD FF 00 16 C1 1B 30 00 xx zz ... zz yy BB CC | Ex: set IP 10.16.150.225, subnet mask: 255.255.248.0, gateway: 10.16.144.1, DNS: 10.16.144.2<br>DDFF0016C11B3000010A1096E1FFFFF8000A1090010A10900249BBCC<br>zz .. zz - 16 bytes, IP address - 4 bytes, Subnet mask - 4 bytes, gateway - 4 bytes, DNS - 4 bytes | DD FF 00 16 C1 1B 30 00 xx zz ... zz yy BB CC |
| Set USB Lock | DD FF 00 07 C1 FF 00 0E xx zz yy BB CC | ex: lock USB<br>DDFF0007C1FF000E010036BBCC<br>zz = 00 - lock USB, 01 - enable USB | AB AB 00 07 C1 FF 00 0E xx zz yy CD CD |
| Factory Reset | DD FF 00 06 C1 10 00 00 xx yy BB CC | DDFF0006C110000001D6BBCC | AB AB 00 06 C1 10 00 00 xx yy CD CD |
| Query TV Status | DD FF 00 06 C1 28 00 00 xx yy BB CC | DDFF0006C128000001EEBBCC | AB AB 00 0C 28 00 00 xx zz zz zz zz zz zz yy CD CD<br>zz: volume<br>zz zz: 05 01 - PC, 05 02 - DVI, 05 03 - DP, 05 04 - HDMI2, 05 05 - HDMI1, 08 01 - VGA<br>zz: 00 - power on, FF - power off<br>zz: 01 - mute; 00 - unmute<br>zz: 00 - no signal, 01 - has signal |
| Query Screen Status | DD FF 00 06 C1 32 00 00 xx yy BB CC | DDFF0006C110000001D6BBCC | AB AB 00 07 C1 32 00 00 xx zz yy CD CD<br>zz: 00 - screen off; 01 - screen on |
| Query Source | DD FF 00 06 C1 1A 00 00 xx yy BB CC | DDFF0006C11A000001DCBBCC | AB AB 00 09 C1 1A 00 00 xx zz zz zz yy CD CD<br>zz zz zz - source, refer to user menu for source defintion |
| Query SW Version | DD FF 00 06 C1 1B 00 00 xx yy BB CC | DDFF0006C11B000001DDBBCC | AB AB 00 09 C1 1B 00 00 xx zz zz zz yy CD CD<br>zz zz zz - Year Month Date |
| Query Backlight Brightness | DD FF 00 06 C1 3E 00 00 xx yy BB CC | DDFF0006C13E000001F8BBCC | AB AB 00 LL C1 3E 00 00 xx zz zz yy CD CD<br>zz:01 - bright，02 - soft, 03 - auto adjust, 04 - stereo frequency conversion，05 - Comfort frequency conversion，06 - custom<br>zz: when first zz is 06 custom, this byte means backlight brightness value: 0-30<br>LL: when first zz is zz, LL = 08, otherwise, LL = 07 |

| Description | Command (HEX Bytes) | Example (PC -> TV ID 01) | TV -> PC |
|---|---|---|---|
| Query Brightness | DD FF 00 06 C1 36 00 01 xx yy BB CC | DDFF0006C136000101F0BBCC | AB AB 00 07 C1 36 00 01 xx zz yy CD CD<br>zz is the brightness value |
| Query Network Status | DD FF 00 06 C1 FF 00 16 xx yy BB CC | DDFF0006C1FF0016012FBBCC | AB AB 00 07 C1 FF 00 16 xx zz yy CD CD<br>zz: 00 - no network connection; 01 - network connected |
| Query Sound Mode | DD FF 00 06 C1 FF 00 02 xx yy BB CC | DDFF0006C1FF0002013BBBCC | AB AB 00 07 C1 FF 00 02 xx zz yy CD CD<br>zz = 00 - standard，01 - music, 02 - news, 08 - movie, 10 - sports，20 - custom, 30 - voice, 40 - meeting |
| Query AC Power On Status | DD FF 00 06 C1 FF 00 08 xx yy BB CC | DDFF0006C1FF00080131BBCC | AB AB 00 07 C1 FF 00 08 xx zz yy CD CD<br>zz: 00 - power on; 01 - Last mode; 02 - standby |
| Query IP Address | DD FF 00 06 C1 1B 20 00 xx yy BB CC | DDFF0006C11B200001FDBBCC | AB AB 00 16 C1 1B 20 00 xx zz … zz yy CD CD<br>zz zz zz zz - IP address<br>zz zz zz zz - Subnet mask<br>zz zz zz zz Gateway<br>zz zz zz zz - DNS |
| Query Device Temperature | DD FF 00 06 C1 FE 00 00 xx yy BB CC | DDFF0006C1FE00000138BBCC | AB AB 00 07 C1 FE 00 00 xx zz yy CD CD<br>zz: temperature in centigrade |
| Query Eye Protection Mode | DD FF 00 06 C1 FF 00 1D xx yy BB CC | DDFF0006C1FF001D0124BBCC | AB AB 00 07 C1 FF 00 1D xx zz yy CD CD<br>zz: 00 - Off; 01 - On |
| Query SN | DD FF 00 06 C1 FF 00 0B xx yy BB CC | DDFF0006C1FF000B0132BBCC | AB AB 00 1D C1 FF 00 0B xx zz…zz yy CD CD<br>zz .. zz: 23 bytes |
| Query Devicd ID | DD FF 00 06 C1 FF 00 0D xx yy BB CC | DDFF0006C1FF000D0134BBCC | AB AB 00 26 C1 FF 00 0D xx zz…zz yy CD CD<br>zz .. zz: 32 bytes |
| Query MAC Address | DD FF 00 06 C1 6C 00 00 xx yy BB CC | DDFF0006C16C000001AABBCC | AB AB 00 0E C1 6C 00 00 xx zz…zz yy CD CD<br>zz .. zz: 8 bytes |
| Send Remote Controller Key Code | DD FF 00 08 C1 17 00 00 xx zz zz yy BB CC | ex: send menu key: zz zz = 00 00<br>DDFF0008C1170000010000DFBB CC<br>zz zz = 00 00 - Menu; 00 01 - UP, 00 02 - DOWN, 00 03 - LEFT, 00 04 - RIGHT， 00 05 - OK， 00 06 - Return, 00 07 - Source | N/A |
| Open Setting Menu | DD FF 00 06 C1 41 00 00 xx yy BB CC | DDFF0006C14100000187BBCC | AB AB 00 06 C1 41 00 00 xx yy CD CD |
| Open Home | DD FF 00 06 C1 FF 00 1A xx yy BB CC | DDFF0006C1FF001A0123BBCC | AB AB 00 06 C1 FF 00 1A xx yy CD CD |
| Open CMS | DD FF 00 06 C1 FF 00 13 xx yy BB CC | DDFF0006C1FF0013012ABBCC | AB AB 00 06 C1 FF 00 13 xx yy CD CD |
| Open ScreenShare | DD FF 00 06 C1 43 00 00 xx yy BB CC | DDFF0006C14300000185BBCC | AB AB 00 06 C1 43 00 00 xx yy CD CD |
| Turn on Hotspot | DD FF 00 06 C1 44 00 00 xx yy BB CC | DDFF0006C14400000182BBCC | AB AB 00 06 C1 44 00 00 xx yy CD CD |
| Take Screenshot | DD FF 00 06 C1 4B 00 00 xx yy BB CC | DDFF0006C14B0000018DBBCC | AB AB 00 06 C1 4B 00 00 xx yy CD CD |

| Description | Command (HEX Bytes) | Example (PC -> TV ID 01) | TV -> PC |
|---|---|---|---|
| Freeze Screen | DD FF 00 06 C1 0F 08 00 xx zz yy BB CC | DDFF0006C10F08000101E2BBCC<br>zz = 01 - freeze; 00 – unfreeze | AB AB 00 06 C1 0F 08 00 xx zz yy CD CD |

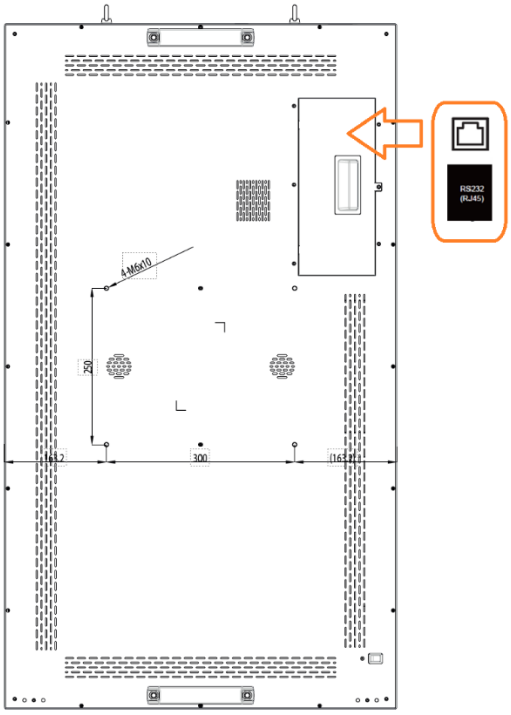
## Window Facing Signage

| Product Series | Android | Product Model | Firmware Version |
|---|---|---|---|
| WF-E | 9.0 | 49WF25E | 49WF25E_MSC_V1.00 |
| | | 55WF25E | 55WF25E_MSC_V1.80 |
| | | 65WF25E | 65WF25E_MSC_V1.20 |
| | | 75WF25E | 75WF25E _MSC_V1.20 |
| WF-M | 9.0 | 49WF35M | 49WF35M_MSC_V1.00 |
| | | 55WF35M | 55WF35M_MSC_V1.00 |
| WF-H | 9.0 | 49WF45H | 49WF45H_MSC_V1.00 |
| | | 55WF45H | 55WF45H _MSC_V1.00 |
| | | 65WF45H | 65WF45H_MSC_V1.10 |
| | | 75WF45H | 75WF45H _MSC_V1.20 |

## Connecting to the Display

Instructions on how to connect the RS232 cable between the Hisense digital signage – E series and the controlling device. Include diagrams of RS232 pin configuration and types of connections. Specify recommended cable types and lengths.

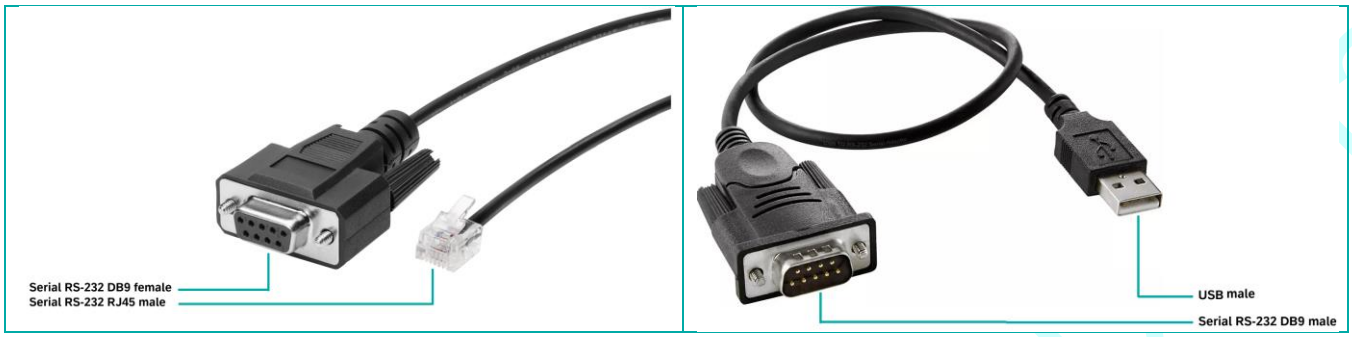
## RS232 Port



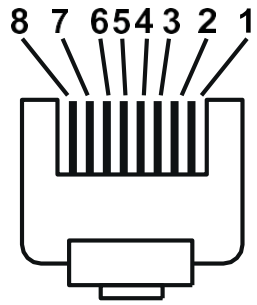
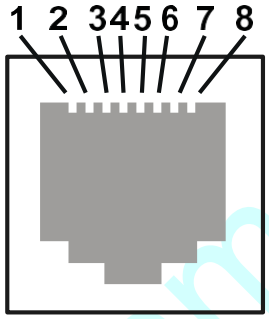

## Connectors

Choose the appropriate cable for using RS232 connections, you need to consider several factors related to the product model and its specific requirements. Here are some example for the connectors which might be required. Check the content of the product to validate whether the cable is included. Prepare the necessary cables in advance to ensure that the connection of RS232 can be communicated.

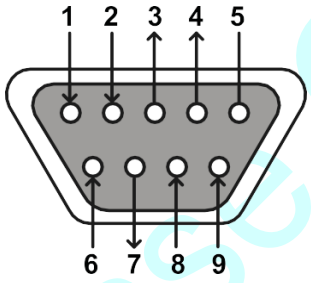
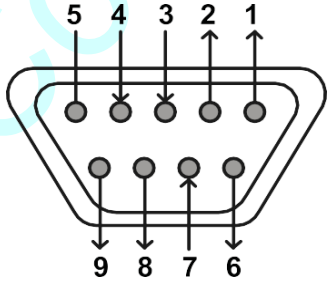
| RS232 DB9 female to RJ45 male cable | RS232 DB9 male to USB male cable |
|---|---|




## Pin Configuration

| RJ45 Male | RJ45 Female | Pin | Signal |
|---|---|---|---|
|  |  | 1 | |
| | | 2 | |
| | | 3 | |
| | | 4 | GND |
| | | 5 | RX |
| | | 6 | |
| | | 7 | TX |
| | | 8 | |



| DB9 Male | DB9 Female | Pin | Signal |
|---|---|---|---|
|  |  | 1 | |
| | | 2 | RX |
| | | 3 | TX |
| | | 4 | |
| | | 5 | GND |
| | | 6 | |
| | | 7 | |
| | | 8 | |



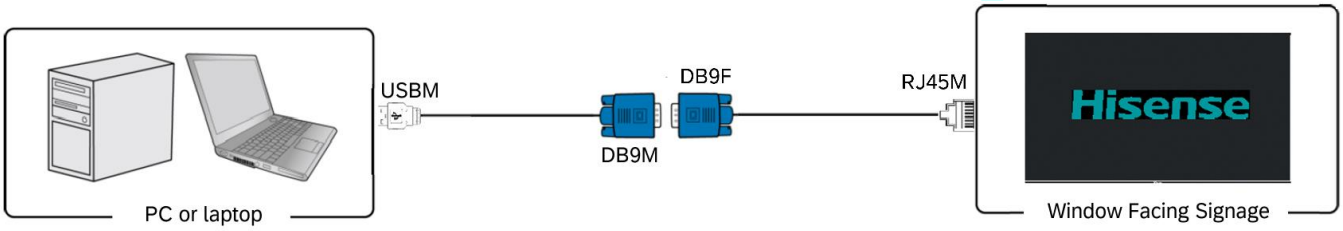
## Wiring Arrangement

| Pinout Connection | |
|---|---|
| RJ45 | DB9 |
| 1 | |
| 2 | |

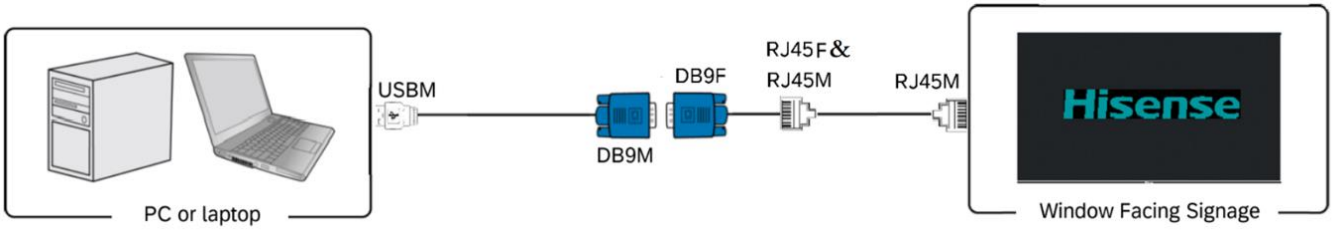
| | |
|---|---|
| 3 | |
| 4 | 5 |
| 5 | 3 |
| 6 | |
| 7 | 2 |
| 8 | |

## Connection Diagram

### Short Distance




### Longer Distance




*The RS232 standard suggests a maximum cable length of 50 feet (15 meters) at standard baud rates. The type of RS232 cable used between devices can vary significantly depending on the specific ports and connectors of the devices being connected. You may follow the diagram above as a reference.*

## RS232 Communication Settings

| Parameters | Value |
|---|---|
| Baud Rate | 115200 |
| Data Bits | 8 |

| | |
|---|---|
| Parity | none |
| Stop Bits | 1 |
| Flow Control | none |

## Command Protocols

This sections outlines the structure and format of commands to be sent to the display. It provides a list of commands and codes for various functions such as power, input selection, volume control, brightness adjustment, and status inquiries.

### Command String

#### PC to Display

This section defines the command string while sending it from a PC to a Hisense display.

You can find the byte indication for each string:

| Header | Monitor ID | Category | Code 0 | Code 1 | Length | Data Control | Command | Checksum |
|---|---|---|---|---|---|---|---|---|
| 1 byte | 1 byte | 1 byte | 1 byte | 1 byte | 1 byte | 1 byte | Empty or Data[0] - Data[N]<br>N is 0-36 | 1 byte |

You can find the detailed description for each string:

| Number of Field | Name of Field | Description |
|---|---|---|
| Byte 1 | Header | Header=0xA6 |
| Byte 2 | Monitor ID | Monitor ID range: 0x01 - 0xFF |
| Byte 3 | Category | Category = 0x00 (fixed) |
| Byte 4 | Code 0 | Code 0 = 0x00 (fixed) |
| Byte 5 | Code 1 | Code 1 = 0x00 (fixed) |
| Byte 6 | Length | Length = N + 3, where N is value in field Command "Data[N]" |
| Byte 7 | Data Control | Data Control = 0x01 (fixed) |
| Byte 8 - Byte 44 | Command | Data[0] - Data[N]<br>This field can be empty, if it is not empty, the range of N is: 0 - 36 |
| Last Byte | Checksum | All bytes except last byte calculated by XOR |

#### Display to PC

This section defines the response string from a display to a host controller, after the host controller sends a command, typically serves as an acknowledgment or status report.

*There is no response message from the PC when the wrong ID address is being used.*

You can find the byte indication for each string:

| Header | Monitor ID | Category | Code 0 | Length | Data Control | Command | Result | Checksum |
|---|---|---|---|---|---|---|---|---|
| 1 byte | 1 byte | 1 byte | 1 byte | 1 byte | 1 byte | 1 byte | Data[0] - Data[N] N is 0-36 | 1 byte |

You can find the detailed description for each string:

| Number of Field | Name of Field | Description |
|---|---|---|
| Byte 1 | Header | Header=0x21 |
| Byte 2 | Monitor ID | Monitor ID range: 0x01 - 0xFF |
| Byte 3 | Category | Category = 0x00 (fixed) |
| Byte 4 | Code 0 | Code 0 = 0x00 (fixed) |
| Byte 5 | Length | For feedback of "set" command, length = 0x04<br>For feedback of "get" command, length is the number of rest bytes in this message |
| Byte 6 | Data Control | Data Control = 0x01 (fixed) |
| Byte 7 | Command | For feedback of "set" command, 0x00 (fixed)<br>For feedback of "get" command, it is same as the Data[0] of command in message PC-> TV |
| Byte 8-N | Result | Data[0] - Data[N], the range of N is: 0 - 36 For feedback of "set" command:<br>1. 0x00: Completed, normal response.<br>2. 0x01: Limit Over, the packet was received normally, but the data value was over the upper limit.<br>3. 0x02: Limit Over, the packet was received normally, but the data value was over the lower limit.<br>4. 0x03: Command cancelled, the packet is received normally but either the value of data is incorrect, or the request is not permitted for the current host.<br>5. 0x04: Parse Error, received not defined format data or checksum error.<br>For feedback of "get" command, the result depends on Data[1]-Data[N] in "get" command. |
| Last Byte | Checksum | All bytes except last byte calculated by XOR |

## Command Table

| Description | Example (to screen ID 01) | Feedback from Screen | Note |
|---|---|---|---|
| Power On | A6 01 00 00 00 04 01 18 02 B8 | | |
| Power Off | A6 01 00 00 00 05 01 B0 00 74 67 | | |
| HDMI 1 Input | A6 01 00 00 00 04 01 AC 0D 03 | | |
| HDMI 2 Input | A6 01 00 00 00 04 01 AC 06 08 | | |
| Set Volume | A6 01 00 00 00 04 01 44 4D AB | | |
| Query Input Selection | A6 01 00 00 00 03 01 AD 08 | A6 01 00 00 00 04 01 AD 14 1B | 14:Android 0D:HDMI1 06:HDMI 2 |
| Query Power State | A6 01 00 00 00 03 01 19 BC | A6 01 00 00 00 04 01 19 02 B9 | 01:OFF 02:ON |
| Query Volume Level | A6 01 00 00 00 03 01 45 E0 | A6 01 00 00 00 04 01 45 19 FE | 19:volume 25 |
| Source Menu | A6 01 00 00 00 05 01 B0 00 FA E9 | | |
| Settings Menu | A6 01 00 00 00 05 01 B0 00 FD EE | | |
| Up | A6 01 00 00 00 05 01 B0 00 67 74 | | |
| Down | A6 01 00 00 00 05 01 B0 00 6C 7F | | |
| Ok | A6 01 00 00 00 05 01 B0 00 1C 0F | | |
| Right | A6 01 00 00 00 05 01 B0 00 6A 79 | | |
| Left | A6 01 00 00 00 05 01 B0 00 69 7A | | |
| Home | A6 01 00 00 00 05 01 B0 00 66 75 | | |
| Vol+ | A6 01 00 00 00 05 01 B0 00 73 60 | | |
| Vol- | A6 01 00 00 00 05 01 B0 00 72 61 | | |
| Return | A6 01 00 00 00 05 01 B0 00 9E 8D | | |
| SET ON | A6 01 00 00 00 04 01 FF 01 5C | | |
| SET OFF | A6 01 00 00 00 04 01 FF 00 5D | | |
| GET Screen status | A6 01 00 00 00 03 01 FF 5A | A6 01 00 00 00 04 01 FF 01 5C | 01:ON 00:OFF |
| GET Backlight status | A6 01 00 00 00 03 01 FE 5B | A6 01 00 00 00 04 01 FE 64 38 | 64: backlight 100 |
| SET Brightness value | A6 01 00 00 00 04 01 FD 00 5F | | 00-64 |
| SET Power on by scheduling | A6 01 00 00 00 05 01 FC 08 00 57 | | 08:00 power on ,24 24 unset |
| SET Power off by scheduling | A6 01 00 00 00 05 01 FB 18 00 40 | | 18:00 power off,24 24unset |
| GET Internal Temperature value | A6 01 00 00 00 03 01 FA 5F | A6 01 00 00 00 05 01 FA 1A 05 46 | 1A 05:26.5° |

## Interactive Digital Board – AE Series

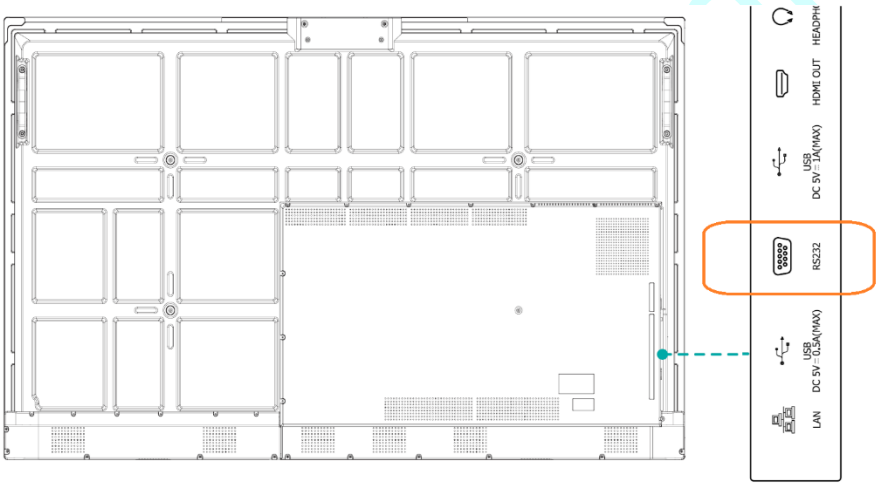
| Product Series | Android | Product Model | Firmware Version |
|---|---|---|---|
| AE | 8.0 | 65WR60AE | M1124 |
| | | 65WR60AE (0001) | M1124 |
| | | HN75WR80U | M1124 |
| | | HN75WR80U (0001) | M1124 |

| | | | |
|---|---|---|---|
| | | 86WR60AE | M1124 |
| | | 86WR60AE (0100) | M1124 |

## Connecting to the Display

Instructions on how to connect the RS232 cable between the Hisense interactive digital board – AE series and the controlling device. Include diagrams of RS232 pin configuration and types of connections. Specify recommended cable types and lengths.

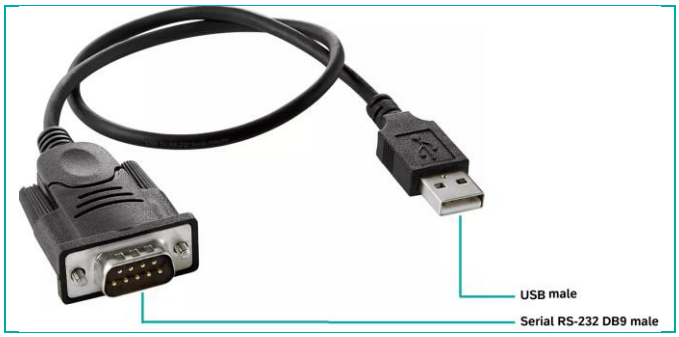
### RS232 Port



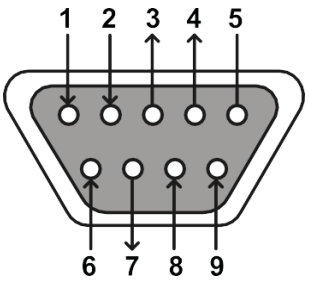
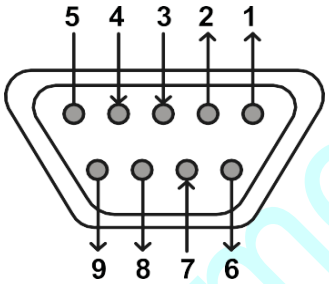

### Connectors

Choose the appropriate cable for using RS232 connections, you need to consider several factors related to the product model and its specific requirements. Here is an example for the connector which is required. Check the content of the product to validate whether the cable is included. Prepare the necessary cables in advance to ensure that the connection of RS232 can be communicated.

RS232 DB9 male to USB male cable




## Pin Configuration

| RJ45 Male | RJ45 Female | Pin | Signal |
|---|---|---|---|
|  |  | 1 | |
| | | 2 | RX |
| | | 3 | TX |
| | | 4 | |
| | | 5 | GND |
| | | 6 | |
| | | 7 | |
| | | 8 | |



## Connection Diagram


*The RS232 standard suggests a maximum cable length of 50 feet (15 meters) at standard baud rates. The type of RS232 cable used between devices can vary significantly depending on the specific ports and connectors of the devices being connected. You may follow the diagram above as a reference.*

## RS232 Communication Settings

| Parameters | Value |
|---|---|
| Baud Rate | 9600 |
| Data Bits | 8 |
| Parity | none |
| Stop Bits | 1 |
| Flow Control | none |

## Command Protocols

This sections outlines the structure and format of commands to be sent to the display. It provides a list of commands and codes for various functions such as power, input selection, volume control, brightness adjustment, and status inquiries.

### Command String

PC to Display

This section defines the command string while sending it from a PC to a Hisense display.

You can find the byte indication for each string:

| Header (2 Bytes) | | Length (2 Bytes) | | Command (4 Bytes) | | | | Monitor ID (1 Byte) | Data (N Bytes) | | | Checksum (1 Bytes) | End (2 Bytes) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DD | FF | | | | | | | | | | | | BB | CC |

#### Display to PC

This section defines the response string from a display to a host controller, after the host controller sends a command, typically serves as an acknowledgment or status report.

*There is no response message from the PC when the wrong ID address is being used.*

You can find the byte indication for each string:

| Header (2 Bytes) | Length (2 Bytes) | Command (4 Bytes) | Monitor ID (1 Byte) | Data (N Bytes) | Checksum (1 Bytes) | End (2 Bytes) |
|---|---|---|---|---|---|---|

| AB | AB | | | | | | | | | | | | CD | CD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

## Command Table

| Description | Command (HEX Bytes) | Example (PC -> TV ID 01) | Command TV -> PC |
|---|---|---|---|
| Power On | DD FF 00 08 C1 15 00 00 xx BB BB yy BB CC | DDFF0008C115000001BBBBDDBBCC | AB AB 00 08 C1 15 00 00 xx BB BB yy CD CD<br>When TV is in standby sate, send this command will get one feedback from TV, once TV starts up, it will send feedback again. |
| Power Off | DD FF 00 08 C1 15 00 00 xx AA AA yy BB CC | DDFF0008C115000001AAAADDBBCC | AB AB 00 08 C1 15 00 00 xx AA AA yy CD CD |
| Screen On | DD FF 00 07 C1 31 00 00 xx 00 yy BB CC | DDFF0007C13100000100F6BBCC | AB AB 00 07 C1 31 00 00 xx 00 yy CD CD |
| Screen Off | DD FF 00 07 C1 31 00 00 xx 01 yy BB CC | DDFF0007C13100000101F7BBCC | AB AB 00 07 C1 31 00 00 xx 01 yy CD CD |
| Reboot | DD FF 00 06 C1 1E 00 00 xx yy BB CC | DDFF0006C11E000001D8BBCC | AB AB 00 06 C1 1E 00 00 xx yy CD CD |
| Set AC Power On Mode | DD FF 00 07 C1 FF 00 09 xx zz yy BB CC | DDFF0007C1FF0009010031BBCC | AB AB 00 07 C1 FF 00 09 xx zz yy CD CD |
| DP | DD FF 00 07 C1 08 00 01 xx 0C yy BB CC | DDFF0007C1080001010CC2BBCC | AB AB 00 07 C1 08 00 01 xx 0C yy CD CD |
| Type-C | DD FF 00 07 C1 08 00 01 xx 0B yy BB CC | DDFF0007C1080001010BC5BBCC | AB AB 00 07 C1 08 00 01 xx 0B yy CD CD |
| Front HDMI | DD FF 00 07 C1 08 00 01 xx 05 yy BB CC | DDFF0007C10800010105CBBBCC | AB AB 00 07 C1 08 00 01 xx 05 yy CD CD |
| Side HDMI | DD FF 00 07 C1 08 00 01 xx 06 yy BB CC | DDFF0007C10800010106C8BBCC | AB AB 00 07 C1 08 00 01 xx 06 yy CD CD |
| OPS | DD FF 00 07 C1 08 00 01 xx 04 yy BB CC | DDFF0007C10800010104CABBCC | AB AB 00 07 C1 08 00 01 xx 04 yy CD CD |
| Set Screen Aspect Ratio | DD FF 00 07 C1 35 00 00 xx zz yy BB CC<br>Once this command is set, reboot<br>TV, it will show with expected ratio | ex: set screen ratio 90 degrees<br>DDFF0007C13500000109FBBBCC<br>zz = 00 - 0 degree, 01 - 90 degree | AB AB 00 07 C1 35 00 00 xx zz yy CD CD |
| Set Mute | DD FF 00 07 C1 26 00 00 xx 01 yy BB CC | DDFF0007C12600000101E0BBCC | AB AB 00 07 C1 26 00 00 xx 01 yy CD CD |
| Set Unmute | DD FF 00 07 C1 26 00 00 xx 00 yy BB CC | DDFF0007C12600000100E1BBCC | AB AB 00 07 C1 26 00 00 xx 00 yy CD CD |
| Set Volume | DD FF 00 07 C1 27 00 00 xx zz | DDFF0007C12700000101E1BBCC | AB AB 00 07 C1 27 00 00 xx zz yy CD |

| Description | Command (HEX Bytes) | Example (PC -> TV ID 01) | Command TV -> PC |
|---|---|---|---|
| | yy BB CC | zz: volume range 0-100 | CD |
| Set Backlight Brightness | DD FF 00 08 C1 32 00 00 xx 06 zz<br>yy BB CC | ex: set brightness to 32 - zz = 0x20<br>DDFF0008C1320000010620DCBBCC | AB AB 00 08 C1 32 00 00 xx 06 zz CD CD |
| Set Backlight Brightness Auto Adjust | DD FF 00 07 C1 34 00 00 xx zz<br>yy BB CC | ex: set brightness auto adjust on<br>DDFF0007C13400000100F3BBCC<br>zz = 00 - on, 01 - off | AB AB 00 07 C1 34 00 00 xx zz yy CD CD |
| Set Date | DD FF 00 09 C1 1C 00 00 xx zz zz zz yy BB CC | ex: set date to 23.Jan.2<br>DDFF0009C11C000001170102C1BBCC<br>zz zz zz = Year Month Day | AB AB 00 09 C1 1C 00 00 xx zz zz zz yy CD CD<br>zz zz zz = FF FF FF when error |
| Set Time | DD FF 00 09 C1 1D 00 00 xx zz zz zz yy BB CC | ex: set time to 12:25:2<br>DDFF0009C11D0000010C1902C3BBCC<br>zz zz zz = Hour Minute Second | AB AB 00 09 C1 1D 00 00 xx zz zz zz yy CD CD<br>zz zz zz = FF FF FF when error |
| Set Schedule for Power On | DD FF 00 09 C1 3E 00 00 xx tt zz zz yy BB CC | ex: power on at 9:10 every day<br>DDFF0009C13E00000101090AF5BBCC<br>tt = 00 - turn off schedule, 01 - everyday<br>zz zz = Hour Minute | AB AB 00 09 C1 3E 00 00 xx zz zz zz yy CD CD |
| Set Schedule for Power Off | DD FF 00 09 C1 3F 00 00 xx tt zz zz yy BB CC | ex: power off at 18:10 every day<br>DDFF0009C13F00000101120AEFBBCC<br>tt = 0 - turn off schedule, 1 - everyday<br>zz zz = Hour Minute | AB AB 00 09 C1 3F 00 00 xx zz zz zz yy CD CD |
| Set Brightness | DD FF 00 07 C1 36 00 00 xx zz<br>yy BB CC<br>current source must be: DP, VGA, HDMI, PC, DVI | ex: set brightness to 32 - zz = 0x20<br>DDFF0007C13600000120D1BBCC | AB AB 00 07 C1 36 00 00 xx zz yy CD CD |
| Set Contrast | DD FF 00 07 C1 37 00 00 xx zz<br>yy BB CC<br>current source must be: DP, VGA, HDMI, PC, DVI | ex: set contrast to 32 - zz = 0x20<br>DDFF0007C13700000120D0BBCC | AB AB 00 07 C1 37 00 00 xx zz yy CD CD |
| Set Sharpness | DD FF 00 07 C1 38 00 00 xx zz<br>yy BB CC<br>current source must be: DP, VGA, HDMI, PC, DVI | ex: set sharpness to 32 - zz = 0x20<br>DDFF0007C13800000120DFBBCC | AB AB 00 07 C1 38 00 00 xx zz yy CD CD |
| Set Color Temperature | DD FF 00 07 C1 39 00 00 xx zz<br>yy BB CC<br>current source must be: DP, VGA, HDMI, PC, DVI | ex: set colour temperature to 32 - zz = 0x20<br>DDFF0007C13900000120DEBBCC | AB AB 00 07 C1 39 00 00 xx zz yy CD CD |
| Set Noise Reduction | DD FF 00 07 C1 3A 00 00 xx zz<br>yy BB CC<br>current source must be: DP, VGA, HDMI, PC, DVI | ex: set noise reduction to High - zz = 0x03<br>DDFF0007C13A00000103FEBBCC<br>zz = 01 - low, 02 - medium, 03 - high, 04 - auto, 00 - | AB AB 00 07 C1 3A 00 00 xx zz yy CD CD |

| Description | Command (HEX Bytes) | Example (PC -> TV ID 01) | Command TV -> PC |
|---|---|---|---|
| | | off | |
| Set Image Scaling | DD FF 00 07 C1 3B 00 00 xx zz yy BB CC<br>current source must be: DP, VGA,<br>HDMI, PC, DVI | ex: set image scaling to Full - zz = 0x03<br>DDFF0007C13B00000103FFBBCC<br>zz = 00 - full, 01 - 16:9, 02 - 4:3, 03 - scaling 1, 04 -<br>scaling 2, 05 - point to point | AB AB 00 07 C1 3B 00 00 xx zz yy CD CD |
| Set Picture Mode | DD FF 00 07 C1 0F 06 00 xx zz yy BB CC | ex: set picture mode to movie mode - zz = 0x03 DDFF0007C10F060001030CBBCC<br>zz = 00 - standard, 01 - bright, 02 - soft, 03 - Movie,<br>04 - Text, 5 - gaming 12 – natural | AB AB 00 07 C1 0F 06 00 xx zz yy CD CD |
| Set Sound Mode | DD FF 00 07 C1 FF 00 03 xx zz yy BB CC | ex: set sound mode to standard mode - zz = 0x00 DDFF0007C1FF000301003BBBCC<br>zz = 00 - standard，01 - music, 02 - news, 08 - movie, 10 - sports，20 - custom, 30 - voice, 40 - meeting | AB AB 00 07 C1 FF 00 03 xx zz yy CD CD |
| Set Eye Protection Mode | DD FF 00 07 C1 FF 00 1E xx zz yy BB CC | ex: set eye protection mode on - zz = 0x01<br>DDFF0007C1FF001E010127BBCC<br>zz = 00 - off, 01 - on | AB AB 00 07 C1 FF 00 1E xx zz yy CD CD |
| VGA Auto Adjust | DD FF 00 07 C1 01 00 00 xx yy BB CC<br>current source must be VGA | ex: VGA Auto Adjust<br>DDFF0007C101000001C6BBCC<br>zz = 00 - off, 01 – on | AB AB 00 07 C1 01 00 00 xx yy CD CD |
| Set anti-burn-in (image retention) | DD FF 00 07 C1 33 00 00 xx zz yy BB CC | ex: set anti-burn-in on<br>DDFF0007C13300000101F4BBCC<br>zz = 00 - off, 01 - on | AB AB 00 07 C1 33 00 00 xx zz yy CD CD |
| Set Power on delay | DD FF 00 07 C1 3C 00 00 xx zz yy BB CC | ex: set power on delay to 10s<br>DDFF0007C13C0000010AF1BBCC<br>zz = 00 - off, others - delay time, range: 2s - 255s | AB AB 00 07 C1 3C 00 00 xx zz yy CD CD |
| Set Video Wall | DD FF 00 09 C1 0A 00 00 xx zz zz<br>zz yy BB CC | ex: vertical 3 devices, horizontal 4 devices, device position: 6<br>DDFF0009C10A000001030406C2BBCC<br>zz: how many devices in vertical zz: how many devices in horizontal zz: current device position | AB AB 00 09 C1 0A 00 00 xx zz zz zz yy CD CD<br><table><tr><td>1</td><td>2</td><td>3</td></tr><tr><td>4</td><td>5</td><td>6</td></tr><tr><td>7</td><td>8</td><td>9</td></tr><tr><td>10</td><td>11</td><td>12</td></tr></table> |

| Description | Command (HEX Bytes) | Example (PC -> TV ID 01) | Command TV -> PC |
|---|---|---|---|
| Set Static IP Address of LAN | DD FF 00 16 C1 1B 30 00 xx zz ... zz yy BB CC | Ex: set IP 10.16.150.225, subnet mask: 255.255.248.0, gateway: 10.16.144.1, DNS: 10.16.144.2<br>DDFF0016C11B3000010A1096E1FFFFF8000A109 0010A10900249BBCC<br>zz .. zz - 16 bytes, IP address - 4 bytes, Subnet<br>mask - 4 bytes, gateway - 4 bytes, DNS - 4 bytes | DD FF 00 16 C1 1B 30 00 xx zz ... zz yy BB CC |
| Set USB Lock | DD FF 00 07 C1 FF 00 0E xx zz yy BB CC | ex: lock USB<br>DDFF0007C1FF000E010036BBCC<br>zz = 00 - lock USB, 01 - enable USB | AB AB 00 07 C1 FF 00 0E xx zz yy CD CD |
| Factory Reset | DD FF 00 06 C1 10 00 00 xx yy BB CC | DDFF0006C110000001D6BBCC | AB AB 00 06 C1 10 00 00 xx yy CD CD |
| Query TV Status | DD FF 00 06 C1 28 00 00 xx yy BB CC | DDFF0006C128000001EEBBCC | AB AB 00 0C 28 00 00 xx zz zz zz zz zz zz yy CD CD<br>zz: volume<br>zz zz: 05 01 - PC, 05 02 - DVI, 05 03 - DP, 05<br>04 - HDMI2, 05 05 - HDMI1, 08 01 - VGA<br>zz: 00 - power on, FF - power off zz: 01 - mute; 00 - unmute<br>zz: 00 - no signal, 01 - has signal |
| Query Screen Status | DD FF 00 06 C1 32 00 00 xx yy BB CC | DDFF0006C110000001D6BBCC | AB AB 00 07 C1 32 00 00 xx zz yy CD CD<br>zz: 00 - screen off; 01 - screen on |
| Query Source | DD FF 00 06 C1 1A 00 00 xx yy BB CC | DDFF0006C11A000001DCBBCC | AB AB 00 09 C1 1A 00 00 xx zz zz zz yy CD CD<br>zz zz zz - source, refer to user menu for source definition |
| Query SW Version | DD FF 00 06 C1 1B 00 00 xx yy BB CC | DDFF0006C11B000001DDBBCC | AB AB 00 09 C1 1B 00 00 xx zz zz zz yy CD CD<br>zz zz zz - Year Month Date |
| Query Backlight Brightness | DD FF 00 06 C1 3E 00 00 xx yy BB CC | DDFF0006C13E000001F8BBCC | AB AB 00 LL C1 3E 00 00 xx zz zz yy CD CD<br>zz:01 - bright, 02 - soft, 03 - auto |

| Description | Command (HEX Bytes) | Example (PC -> TV ID 01) | Command TV -> PC |
|---|---|---|---|
| | | | adjust, 04 - stereo frequency conversion，05 - Comfort frequency conversion，06 - custom<br>zz: when first zz is 06 custom, this byte means backlight brightness value: 0~30<br>LL: when first zz is zz, LL = 08, otherwise, LL = 07 |
| Query Brightness | DD FF 00 06 C1 36 00 01 xx yy BB CC | DDFF0006C136000101F0BBCC | AB AB 00 07 C1 36 00 01 xx zz yy CD CD<br>zz is the brightness value |
| Query Network Status | DD FF 00 06 C1 FF 00 16 xx yy BB CC | DDFF0006C1FF0016012FBBCC | AB AB 00 07 C1 FF 00 16 xx zz yy CD CD<br>zz: 00 - no network connection; 01 - network connected |
| Query Sound Mode | DD FF 00 06 C1 FF 00 02 xx yy BB CC | DDFF0006C1FF0002013BBBCC | AB AB 00 07 C1 FF 00 02 xx zz yy CD CD<br>zz = 00 - standard，01 - music, 02 - news, 08 - movie, 10 - sports，20 - custom, 30 - voice, 40 - meeting |
| Query AC Power On Status | DD FF 00 06 C1 FF 00 08 xx yy BB CC | DDFF0006C1FF00080131BBCC | AB AB 00 07 C1 FF 00 08 xx zz yy CD CD<br>zz: 00 - power on; 01 - Last mode; 02 - standby |
| Query IP Address | DD FF 00 06 C1 1B 20 00 xx yy BB CC | DDFF0006C11B200001FDBBCC | AB AB 00 16 C1 1B 20 00 xx zz ... zz yy CD CD<br>zz zz zz zz - IP address zz zz<br>zz zz - Subnet mask zz zz zz<br>zz Gateway<br>zz zz zz zz - DNS |
| Query Device Temperature | DD FF 00 06 C1 FE 00 00 xx yy BB CC | DDFF0006C1FE00000138BBCC | AB AB 00 07 C1 FE 00 00 xx zz yy CD CD<br>zz: temperature in centigrade |

| Description | Command (HEX Bytes) | Example (PC -> TV ID 01) | Command TV -> PC |
|---|---|---|---|
| Query Eye Protection Mode | DD FF 00 06 C1 FF 00 1D xx yy BB CC | DDFF0006C1FF001D0124BBCC | AB AB 00 07 C1 FF 00 1D xx zz yy CD CD<br>zz: 00 - Off; 01 - On |
| Query SN | DD FF 00 06 C1 FF 00 0B xx yy BB CC | DDFF0006C1FF000B0132BBCC | AB AB 00 1D C1 FF 00 0B xx zz...zz yy CD CD zz .. zz: 23 bytes |
| Query Devicd ID | DD FF 00 06 C1 FF 00 0D xx yy BB CC | DDFF0006C1FF000D0134BBCC | AB AB 00 26 C1 FF 00 0D xx zz...zz yy CD CD zz .. zz: 32 bytes |
| Query MAC Address | DD FF 00 06 C1 6C 00 00 xx yy BB CC | DDFF0006C16C000001AABBCC | AB AB 00 0E C1 6C 00 00 xx zz...zz yy CD CD zz .. zz: 8 bytes |
| Send Remote Controller Key Code | DD FF 00 08 C1 17 00 00 xx zz zz yy BB CC | ex: send menu key: zz zz = 00 00<br>DDFF0008C1170000010000DFBBCC<br>zz zz = 00 00 - Menu; 00 01 - UP, 00 02 - DOWN, 00 03 - LEFT, 00 04 - RIGHT, 00 05 - OK, 00 06 - Return, 00 07 - Source | N/A |
| Open Setting Menu | DD FF 00 06 C1 41 00 00 xx yy BB CC | DDFF0006C14100000187BBCC | AB AB 00 06 C1 41 00 00 xx yy CD CD |
| Open Home | DD FF 00 06 C1 FF 00 1A xx yy BB CC | DDFF0006C1FF001A0123BBCC | AB AB 00 06 C1 FF 00 1A xx yy CD CD |
| Open CMS | DD FF 00 06 C1 FF 00 13 xx yy BB CC | DDFF0006C1FF0013012aBBCC | AB AB 00 06 C1 FF 00 13 xx yy CD CD |
| Open ScreenShare | DD FF 00 06 C1 43 00 00 xx yy BB CC | DDFF0006C14300000185BBCC | AB AB 00 06 C1 43 00 00 xx yy CD CD |
| Turn on Hotspot | DD FF 00 06 C1 44 00 00 xx yy BB CC | DDFF0006C14400000182BBCC | AB AB 00 06 C1 44 00 00 xx yy CD CD |
| Take Screenshot | DD FF 00 06 C1 4B 00 00 xx yy BB CC | DDFF0006C14B0000018DBBCC | AB AB 00 06 C1 4B 00 00 xx yy CD CD |
| Freeze Screen | DD FF 00 06 C1 0F 08 00 xx zz yy BB CC | DDFF0006C10F08000101E2BBCC<br>zz = 01 - freeze; 00 - unfreeze | AB AB 00 06 C1 0F 08 00 xx zz yy CD CD |

## Interactive Digital Board – BE Series

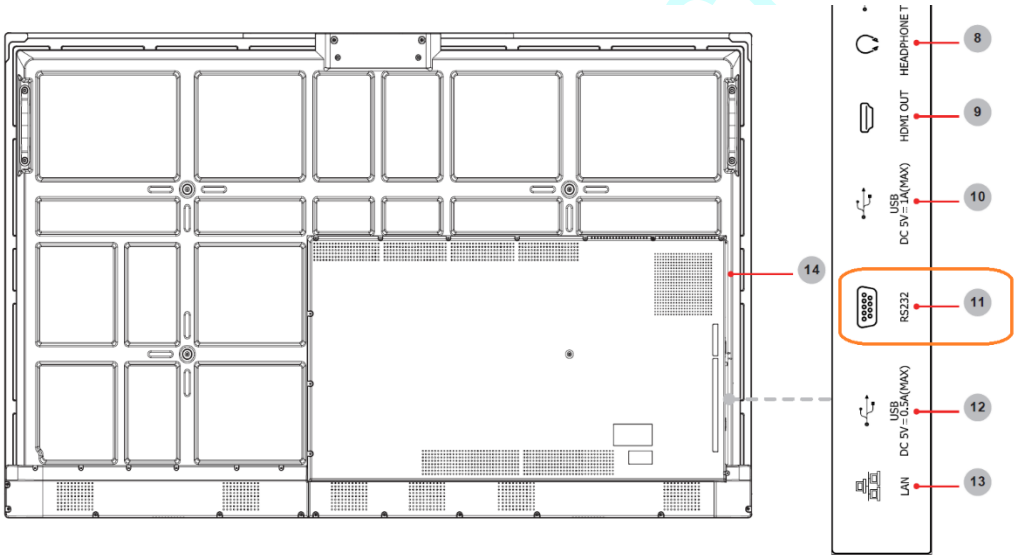
| Product Series | Android | Product Model | Firmware Version |
|---|---|---|---|
| BE | 8.0 | 65WR6BE | N0421 |
| | | 65WR6BE (A000) | N0421 |

| | | | |
|---|---|---|---|
| | | 75WR6BE | N0421 |
| | | 75WR6BE (A000) | N0421 |
| | | 86WR6BE | N0421 |
| | | 86WR6BE (A000) | N0421 |

## Connecting to the Display

Instructions on how to connect the RS232 cable between the Hisense interactive digital board – BE series and the controlling device. Include diagrams of RS232 pin configuration and types of connections. Specify recommended cable types and lengths.

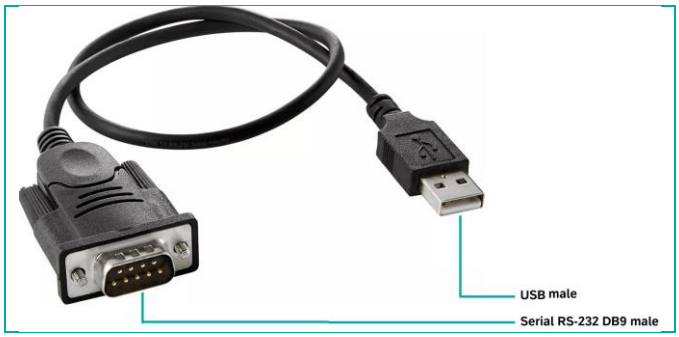
### RS232 Port



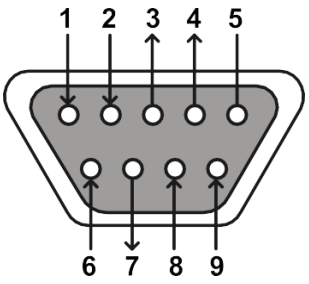
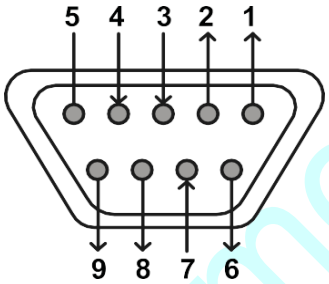

### Connectors

Choose the appropriate cable for using RS232 connections, you need to consider several factors related to the product model and its specific requirements. Here is an example for the connector which is required. Check the content of the product to validate whether the cable is included. Prepare the necessary cables in advance to ensure that the connection of RS232 can be communicated.

RS232 DB9 male to USB male cable




## Pin Configuration

| RJ45 Male | RJ45 Female | Pin | Signal |
|---|---|---|---|
|  |  | 1 | |
| | | 2 | RX |
| | | 3 | TX |
| | | 4 | |
| | | 5 | GND |
| | | 6 | |
| | | 7 | |
| | | 8 | |



## Connection Diagram


*The RS232 standard suggests a maximum cable length of 50 feet (15 meters) at standard baud rates. The type of RS232 cable used between devices can vary significantly depending on the specific ports and connectors of the devices being connected. You may follow the diagram above as a reference.*

## RS232 Communication Settings

| Parameters | Value |
|---|---|
| Baud Rate | 9600 |
| Data Bits | 8 |
| Parity | none |
| Stop Bits | 1 |
| Flow Control | none |

## Command Protocols

This sections outlines the structure and format of commands to be sent to the display. It provides a list of commands and codes for various functions such as power, input selection, volume control, brightness adjustment, and status inquiries.

### Command String

#### PC to Display

This section defines the command string while sending it from a PC to a Hisense display. You can find the byte indication for each string:

| Header (2 Bytes) | | Length (2 Bytes) | | Command (4 Bytes) | | | | Monitor ID (1 Byte) | Data (N Bytes) | | | Checksum (1 Bytes) | End (2 Bytes) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DD | FF | | | | | | | | | | | | BB | CC |

#### Display to PC

This section defines the response string from a display to a host controller, after the host controller sends a command, typically serves as an acknowledgment or status report.

*There is no response message from the PC when the wrong ID address is being used.*

You can find the byte indication for each string:

| Header (2 Bytes) | Length (2 Bytes) | Command (4 Bytes) | Monitor ID (1 Byte) | Data (N Bytes) | Checksum (1 Bytes) | End (2 Bytes) |
|---|---|---|---|---|---|---|

| AB | AB | | | | | | | | | | | | CD | CD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

## Command Table

| Description | Command (HEX Bytes) | Example (PC -> TV ID 01) | Command TV -> PC |
|---|---|---|---|
| Power On | DD FF 00 08 C1 15 00 00 xx BB BB yy BB CC | DDFF0008C115000001BBBBDDBBCC | AB AB 00 08 C1 15 00 00 xx BB BB yy CD CD<br>When TV is in standby sate, send this command will get one feedback from TV, once TV starts up, it will send feedback again. |
| Power Off | DD FF 00 08 C1 15 00 00 xx AA AA yy BB CC | DDFF0008C115000001AAAADDBBCC | AB AB 00 08 C1 15 00 00 xx AA AA yy CD CD |
| Screen On | DD FF 00 07 C1 31 00 00 xx 00 yy BB CC | DDFF0007C13100000100F6BBCC | AB AB 00 07 C1 31 00 00 xx 00 yy CD CD |
| Screen Off | DD FF 00 07 C1 31 00 00 xx 01 yy BB CC | DDFF0007C13100000101F7BBCC | AB AB 00 07 C1 31 00 00 xx 01 yy CD CD |
| Reboot | DD FF 00 06 C1 1E 00 00 xx yy BB CC | DDFF0006C11E000001D8BBCC | AB AB 00 06 C1 1E 00 00 xx yy CD CD |
| Set AC Power On Mode | DD FF 00 07 C1 FF 00 09 xx zz yy BB CC | DDFF0007C1FF0009010031BBCC | AB AB 00 07 C1 FF 00 09 xx zz yy CD CD |
| DP | DD FF 00 07 C1 08 00 01 xx 0C yy BB CC | DDFF0007C1080001010CC2BBCC | AB AB 00 07 C1 08 00 01 xx 0C yy CD CD |
| Type-C | DD FF 00 07 C1 08 00 01 xx 0B yy BB CC | DDFF0007C1080001010BC5BBCC | AB AB 00 07 C1 08 00 01 xx 0B yy CD CD |
| Front HDMI | DD FF 00 07 C1 08 00 01 xx 05 yy BB CC | DDFF0007C10800010105CBBBCC | AB AB 00 07 C1 08 00 01 xx 05 yy CD CD |
| Side HDMI | DD FF 00 07 C1 08 00 01 xx 06 yy BB CC | DDFF0007C10800010106C8BBCC | AB AB 00 07 C1 08 00 01 xx 06 yy CD CD |
| OPS | DD FF 00 07 C1 08 00 01 xx 04 yy BB CC | DDFF0007C10800010104CABBCC | AB AB 00 07 C1 08 00 01 xx 04 yy CD CD |
| Set Screen Aspect Ratio | DD FF 00 07 C1 35 00 00 xx zz yy BB CC<br>Once this command is set, reboot TV, it will show with expected ratio | ex: set screen ratio 90 degrees<br>DDFF0007C13500000109FBBBCC<br>zz = 00 - 0 degree, 01 - 90 degree | AB AB 00 07 C1 35 00 00 xx zz yy CD CD |
| Set Mute | DD FF 00 07 C1 26 00 00 xx 01 yy BB CC | DDFF0007C12600000101E0BBCC | AB AB 00 07 C1 26 00 00 xx 01 yy CD CD |
| Set Unmute | DD FF 00 07 C1 26 00 00 xx 00 yy BB CC | DDFF0007C12600000100E1BBCC | AB AB 00 07 C1 26 00 00 xx 00 yy CD CD |

| Description | Command (HEX Bytes) | Example (PC -> TV ID 01) | Command TV -> PC |
|---|---|---|---|
| Set Volume | DD FF 00 07 C1 27 00 00 xx zz yy BB CC | DDFF0007C12700000101E1BBCC<br>zz: volume range 0-100 | AB AB 00 07 C1 27 00 00 xx zz yy CD CD |
| Set Backlight Brightness | DD FF 00 08 C1 32 00 00 xx 06 zz<br>yy BB CC | ex: set brightness to 32 - zz = 0x20<br>DDFF0008C1320000010620DCBBCC | AB AB 00 08 C1 32 00 00 xx 06 zz CD CD |
| Set Backlight Brightness Auto Adjust | DD FF 00 07 C1 34 00 00 xx zz yy BB CC | ex: set brightness auto adjust on<br>DDFF0007C13400000100F3BBCC<br>zz = 00 - on, 01 - off | AB AB 00 07 C1 34 00 00 xx zz yy CD CD |
| Set Date | DD FF 00 09 C1 1C 00 00 xx zz zz zz yy BB CC | ex: set date to 23.Jan.2<br>DDFF0009C11C000001170102C1BBCC<br>zz zz zz = Year Month Day | AB AB 00 09 C1 1C 00 00 xx zz zz zz yy CD CD<br>zz zz zz = FF FF FF when error |
| Set Time | DD FF 00 09 C1 1D 00 00 xx zz zz zz yy BB CC | ex: set time to 12:25:2<br>DDFF0009C11D0000010C1902C3BBCC<br>zz zz zz = Hour Minute Second | AB AB 00 09 C1 1D 00 00 xx zz zz zz yy CD CD<br>zz zz zz = FF FF FF when error |
| Set Schedule for Power On | DD FF 00 09 C1 3E 00 00 xx tt zz zz yy BB CC | ex: power on at 9:10 every day<br>DDFF0009C13E00000101090AF5BBCC<br>tt = 00 - turn off schedule, 01 - everyday<br>zz zz = Hour Minute | AB AB 00 09 C1 3E 00 00 xx zz zz zz yy CD CD |
| Set Schedule for Power Off | DD FF 00 09 C1 3F 00 00 xx tt zz zz yy BB CC | ex: power off at 18:10 every day<br>DDFF0009C13F00000101120AEFBBCC<br>tt = 0 - turn off schedule, 1 - everyday<br>zz zz = Hour Minute | AB AB 00 09 C1 3F 00 00 xx zz zz zz yy CD CD |
| Set Brightness | DD FF 00 07 C1 36 00 00 xx zz yy BB CC<br>current source must be: DP, VGA, HDMI, PC, DVI | ex: set brightness to 32 - zz = 0x20<br>DDFF0007C13600000120D1BBCC | AB AB 00 07 C1 36 00 00 xx zz yy CD CD |
| Set Contrast | DD FF 00 07 C1 37 00 00 xx zz yy BB CC<br>current source must be: DP, VGA, HDMI, PC, DVI | ex: set contrast to 32 - zz = 0x20<br>DDFF0007C13700000120D0BBCC | AB AB 00 07 C1 37 00 00 xx zz yy CD CD |
| Set Sharpness | DD FF 00 07 C1 38 00 00 xx zz yy BB CC<br>current source must be: DP, VGA, HDMI, PC, DVI | ex: set sharpness to 32 - zz = 0x20<br>DDFF0007C13800000120DFBBCC | AB AB 00 07 C1 38 00 00 xx zz yy CD CD |
| Set Color Temperature | DD FF 00 07 C1 39 00 00 xx zz yy BB CC<br>current source must be: DP, VGA, HDMI, PC, DVI | ex: set colour temperature to 32 - zz = 0x20<br>DDFF0007C13900000120DEBBCC | AB AB 00 07 C1 39 00 00 xx zz yy CD CD |
| Set Noise Reduction | DD FF 00 07 C1 3A 00 00 xx zz yy BB CC | ex: set noise reduction to High - zz = 0x03<br>DDFF0007C13A00000103FEBBCC<br>zz = 01 - low, 02 - medium, 03 - high, 04 - auto, | AB AB 00 07 C1 3A 00 00 xx zz yy CD CD |

| Description | Command (HEX Bytes) | Example (PC -> TV ID 01) | Command TV -> PC |
|---|---|---|---|
| | current source must be: DP, VGA, HDMI, PC, DVI | 00 - off | |
| Set Image Scaling | DD FF 00 07 C1 3B 00 00 xx zz yy BB CC<br>current source must be: DP, VGA,<br>HDMI, PC, DVI | ex: set image scaling to Full - zz = 0x03<br>DDFF0007C13B00000103FFBBCC<br>zz = 00 - full, 01 - 16:9, 02 - 4:3, 03 - scaling 1, 04 -<br>scaling 2, 05 - point to point | AB AB 00 07 C1 3B 00 00 xx zz yy CD CD |
| Set Picture Mode | DD FF 00 07 C1 0F 06 00 xx zz yy BB CC | ex: set picture mode to movie mode - zz = 0x03 DDFF0007C10F060001030CBBCC<br>zz = 00 - standard, 01 - bright, 02 - soft, 03 - Movie,<br>04 - Text, 5 - gaming 12 – natural | AB AB 00 07 C1 0F 06 00 xx zz yy CD CD |
| Set Sound Mode | DD FF 00 07 C1 FF 00 03 xx zz yy BB CC | ex: set sound mode to standard mode - zz = 0x00 DDFF0007C1FF000301003BBBCC<br>zz = 00 - standard，01 - music, 02 - news, 08 - movie, 10 - sports，20 - custom, 30 - voice, 40 - meeting | AB AB 00 07 C1 FF 00 03 xx zz yy CD CD |
| Set Eye Protection Mode | DD FF 00 07 C1 FF 00 1E xx zz yy BB CC | ex: set eye protection mode on - zz = 0x01<br>DDFF0007C1FF001E010127BBCC<br>zz = 00 - off, 01 - on | AB AB 00 07 C1 FF 00 1E xx zz yy CD CD |
| VGA Auto Adjust | DD FF 00 07 C1 01 00 00 xx yy BB CC<br>current source must be VGA | ex: VGA Auto Adjust<br>DDFF0007C101000001C6BBCC<br>zz = 00 - off, 01 – on | AB AB 00 07 C1 01 00 00 xx yy CD CD |
| Set anti-burn-in (image retention) | DD FF 00 07 C1 33 00 00 xx zz yy BB CC | ex: set anti-burn-in on<br>DDFF0007C13300000101F4BBCC<br>zz = 00 - off, 01 - on | AB AB 00 07 C1 33 00 00 xx zz yy CD CD |
| Set Power on delay | DD FF 00 07 C1 3C 00 00 xx zz yy BB CC | ex: set power on delay to 10s<br>DDFF0007C13C0000010AF1BBCC<br>zz = 00 - off, others - delay time, range: 2s - 255s | AB AB 00 07 C1 3C 00 00 xx zz yy CD CD |
| Set Video Wall | DD FF 00 09 C1 0A 00 00 xx zz zz<br>zz yy BB CC | ex: vertical 3 devices, horizontal 4 devices, device position: 6<br>DDFF0009C10A000001030406C2BBCC<br>zz: how many devices in vertical zz: how many devices in horizontal zz: current device position | AB AB 00 09 C1 0A 00 00 xx zz zz zz yy CD CD<br>1 2 3<br>4 5 6<br>7 8 9<br>10 11 12 |
| Set Static IP Address of LAN | DD FF 00 16 C1 1B 30 00 xx zz ...<br>zz yy BB CC | Ex: set IP 10.16.150.225, subnet mask: 255.255.248.0, gateway: 10.16.144.1, DNS: 10.16.144.2<br>DDFF0016C11B3000010A1096E1FFFFF8000A1090010A10900249BBCC | DD FF 00 16 C1 1B 30 00 xx zz ... zz yy BB CC |

| Description | Command (HEX Bytes) | Example (PC -> TV ID 01) | Command TV -> PC |
|---|---|---|---|
| | | zz .. zz - 16 bytes, IP address - 4 bytes, Subnet<br>mask - 4 bytes, gateway - 4 bytes, DNS - 4 bytes | |
| Set USB Lock | DD FF 00 07 C1 FF 00 0E xx zz yy BB CC | ex: lock USB<br>DDFF0007C1FF000E010036BBCC<br>zz = 00 - lock USB, 01 - enable USB | AB AB 00 07 C1 FF 00 0E xx zz yy CD CD |
| Factory Reset | DD FF 00 06 C1 10 00 00 xx yy BB CC | DDFF0006C110000001D6BBCC | AB AB 00 06 C1 10 00 00 xx yy CD CD |
| Query TV Status | DD FF 00 06 C1 28 00 00 xx yy BB CC | DDFF0006C128000001EEBBCC | AB AB 00 0C 28 00 00 xx zz zz zz zz zz zz yy CD CD<br>zz: volume<br>zz zz: 05 01 - PC, 05 02 - DVI, 05 03 - DP, 05<br>04 - HDMI2, 05 05 - HDMI1, 08 01 - VGA<br>zz: 00 - power on, FF - power off zz: 01 - mute; 00 - unmute<br>zz: 00 - no signal, 01 - has signal |
| Query Screen Status | DD FF 00 06 C1 32 00 00 xx yy BB CC | DDFF0006C110000001D6BBCC | AB AB 00 07 C1 32 00 00 xx zz yy CD CD<br>zz: 00 - screen off; 01 - screen on |
| Query Source | DD FF 00 06 C1 1A 00 00 xx yy BB CC | DDFF0006C11A000001DCBBCC | AB AB 00 09 C1 1A 00 00 xx zz zz zz yy CD CD<br>zz zz zz - source, refer to user menu for source definition |
| Query SW Version | DD FF 00 06 C1 1B 00 00 xx yy BB CC | DDFF0006C11B000001DDBBCC | AB AB 00 09 C1 1B 00 00 xx zz zz zz yy CD CD<br>zz zz zz - Year Month Date |
| Query Backlight Brightness | DD FF 00 06 C1 3E 00 00 xx yy BB CC | DDFF0006C13E000001F8BBCC | AB AB 00 LL C1 3E 00 00 xx zz zz yy CD CD<br>zz:01 - bright, 02 - soft, 03 - auto adjust, 04 - stereo frequency conversion, 05 - Comfort frequency conversion, 06 - custom<br>zz: when first zz is 06 custom, this byte means backlight brightness value: 0-30 |

| Description | Command (HEX Bytes) | Example (PC -> TV ID 01) | Command TV -> PC |
|---|---|---|---|
| | | | LL: when first zz is zz, LL = 08, otherwise, LL = 07 |
| Query Brightness | DD FF 00 06 C1 36 00 01 xx yy BB CC | DDFF0006C136000101F0BBCC | AB AB 00 07 C1 36 00 01 xx zz yy CD CD<br>zz is the brightness value |
| Query Network Status | DD FF 00 06 C1 FF 00 16 xx yy BB CC | DDFF0006C1FF0016012FBBCC | AB AB 00 07 C1 FF 00 16 xx zz yy CD CD<br>zz: 00 - no network connection; 01 - network connected |
| Query Sound Mode | DD FF 00 06 C1 FF 00 02 xx yy BB CC | DDFF0006C1FF0002013BBBCC | AB AB 00 07 C1 FF 00 02 xx zz yy CD CD<br>zz = 00 - standard，01 - music, 02 - news, 08 - movie, 10 - sports，20 - custom, 30 - voice, 40 - meeting |
| Query AC Power On Status | DD FF 00 06 C1 FF 00 08 xx yy BB CC | DDFF0006C1FF00080131BBCC | AB AB 00 07 C1 FF 00 08 xx zz yy CD CD<br>zz: 00 - power on; 01 - Last mode; 02 - standby |
| Query IP Address | DD FF 00 06 C1 1B 20 00 xx yy BB CC | DDFF0006C11B200001FDBBCC | AB AB 00 16 C1 1B 20 00 xx zz ... zz yy CD CD<br>zz zz zz zz - IP address zz zz<br>zz zz - Subnet mask zz zz zz<br>zz Gateway<br>zz zz zz zz - DNS |
| Query Device Temperature | DD FF 00 06 C1 FE 00 00 xx yy BB CC | DDFF0006C1FE00000138BBCC | AB AB 00 07 C1 FE 00 00 xx zz yy CD CD<br>zz: temperature in centigrade |
| Query Eye Protection Mode | DD FF 00 06 C1 FF 00 1D xx yy BB CC | DDFF0006C1FF001D0124BBCC | AB AB 00 07 C1 FF 00 1D xx zz yy CD CD<br>zz: 00 - Off; 01 - On |
| Query SN | DD FF 00 06 C1 FF 00 0B xx yy BB CC | DDFF0006C1FF000B0132BBCC | AB AB 00 1D C1 FF 00 0B xx zz...zz yy CD CD zz .. zz: 23 bytes |
| Query Devicd ID | DD FF 00 06 C1 FF 00 0D xx yy BB CC | DDFF0006C1FF000D0134BBCC | AB AB 00 26 C1 FF 00 0D xx zz...zz yy CD CD zz .. zz: 32 bytes |
| Query MAC Address | DD FF 00 06 C1 6C 00 00 xx yy BB CC | DDFF0006C16C000001AABBCC | AB AB 00 0E C1 6C 00 00 xx zz...zz yy CD CD zz .. zz: 8 bytes |

| Description | Command (HEX Bytes) | Example (PC -> TV ID 01) | Command TV -> PC |
|---|---|---|---|
| Send Remote Controller Key Code | DD FF 00 08 C1 17 00 00 xx zz zz yy BB CC | ex: send menu key: zz zz = 00 00<br>DDFF0008C1170000010000DFBBCC<br>zz zz = 00 00 - Menu; 00 01 - UP, 00 02 - DOWN, 00 03 - LEFT, 00 04 - RIGHT，00 05 - OK，00 06 - Return, 00 07 - Source | N/A |
| Open Setting Menu | DD FF 00 06 C1 41 00 00 xx yy BB CC | DDFF0006C14100000187BBCC | AB AB 00 06 C1 41 00 00 xx yy CD CD |
| Open Home | DD FF 00 06 C1 FF 00 1A xx yy BB CC | DDFF0006C1FF001A0123BBCC | AB AB 00 06 C1 FF 00 1A xx yy CD CD |
| Open CMS | DD FF 00 06 C1 FF 00 13 xx yy BB CC | DDFF0006C1FF0013012aBBCC | AB AB 00 06 C1 FF 00 13 xx yy CD CD |
| Open ScreenShare | DD FF 00 06 C1 43 00 00 xx yy BB CC | DDFF0006C14300000185BBCC | AB AB 00 06 C1 43 00 00 xx yy CD CD |
| Turn on Hotspot | DD FF 00 06 C1 44 00 00 xx yy BB CC | DDFF0006C14400000182BBCC | AB AB 00 06 C1 44 00 00 xx yy CD CD |
| Take Screenshot | DD FF 00 06 C1 4B 00 00 xx yy BB CC | DDFF0006C14B0000018DBBCC | AB AB 00 06 C1 4B 00 00 xx yy CD CD |
| Freeze Screen | DD FF 00 06 C1 0F 08 00 xx zz yy BB CC | DDFF0006C10F08000101E2BBCC<br>zz = 01 - freeze; 00 - unfreeze | AB AB 00 06 C1 0F 08 00 xx zz yy CD CD |

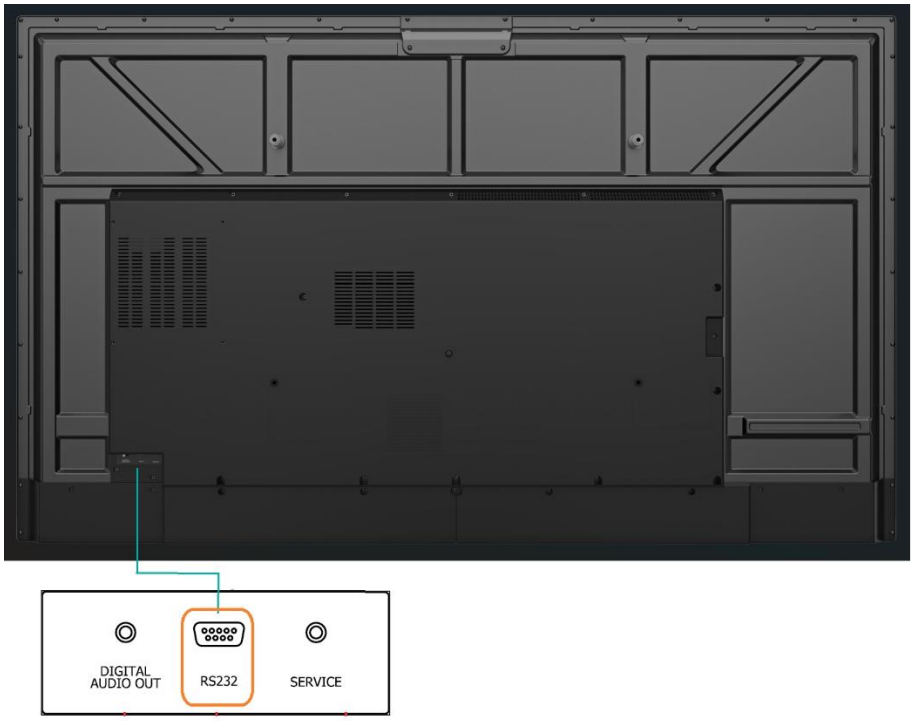
## Interactive Digital Board – CE Series

| Product Series | Android | Product Model | Firmware Version |
|---|---|---|---|
| CE | 8.0 | 65WR6CE | M1012 |
| | | 75WR6CE | M1012 |
| | | 86WR6CE | M1012 |

## Connecting to the Display

Instructions on how to connect the RS232 cable between the Hisense interactive digital board – CE series and the controlling device. Include diagrams of RS232 pin configuration and types of connections. Specify recommended cable types and lengths.

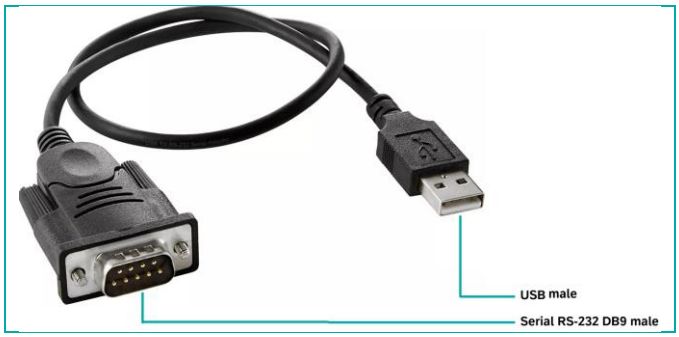
## RS232 Port



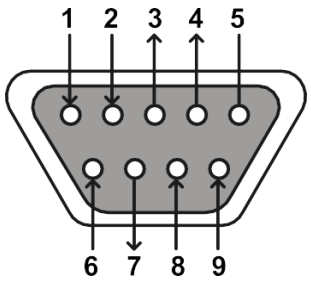
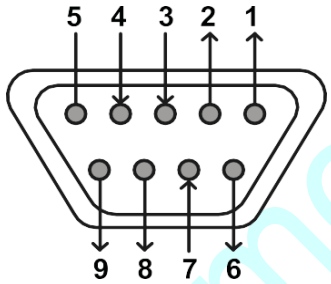

## Connectors

Choose the appropriate cable for using RS232 connections, you need to consider several factors related to the product model and its specific requirements. Here is an example for the connector which is required. Check the content of the product to validate whether the cable is included. Prepare the necessary cables in advance to ensure that the connection of RS232 can be communicated.

RS232 DB9 male to USB male cable




## Pin Configuration

| RJ45 Male | RJ45 Female | Pin | Signal |
|---|---|---|---|
|  |  | 1 | |
| | | 2 | RX |
| | | 3 | TX |
| | | 4 | |
| | | 5 | GND |
| | | 6 | |
| | | 7 | |
| | | 8 | |



## Connection Diagram


*The RS232 standard suggests a maximum cable length of 50 feet (15 meters) at standard baud rates. The type of RS232 cable used between devices can vary significantly depending on the specific ports and connectors of the devices being connected. You may follow the diagram above as a reference.*

## RS232 Communication Settings

| Parameters | Value |
|---|---|
| Baud Rate | 9600 |
| Data Bits | 8 |
| Parity | none |
| Stop Bits | 1 |
| Flow Control | none |

## Command Protocols

This sections outlines the structure and format of commands to be sent to the display. It provides a list of commands and codes for various functions such as power, input selection, volume control, brightness adjustment, and status inquiries.

### Command String

#### PC to Display

This section defines the command string while sending it from a PC to a Hisense display. You can find the byte indication for each string:

| Header (2 Bytes) | | Length (2 Bytes) | | Command (4 Bytes) | | | | Monitor ID (1 Byte) | Data (N Bytes) | | | Checksum (1 Bytes) | End (2 Bytes) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DD | FF | | | | | | | | | | | | BB | CC |

#### Display to PC

This section defines the response string from a display to a host controller, after the host controller sends a command, typically serves as an acknowledgment or status report.

*There is no response message from the PC when the wrong ID address is being used.*

You can find the byte indication for each string:

| Header (2 Bytes) | Length (2 Bytes) | Command (4 Bytes) | Monitor ID (1 Byte) | Data (N Bytes) | Checksum (1 Bytes) | End (2 Bytes) |
|---|---|---|---|---|---|---|

| AB | AB | | | | | | | | | | | | CD | CD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

## Command Table

| Description | Command (HEX Bytes) | Example (PC -> TV ID 01) | Command TV -> PC |
|---|---|---|---|
| Power On | DD FF 00 08 C1 15 00 00 xx BB BB yy BB CC | DDFF0008C115000001BBBBDDBBCC | AB AB 00 08 C1 15 00 00 xx BB BB yy CD CD<br>When TV is in standby sate, send this command will get one feedback from TV, once TV starts up, it will send feedback again. |
| Power Off | DD FF 00 08 C1 15 00 00 xx AA AA yy BB CC | DDFF0008C115000001AAAADDBBCC | AB AB 00 08 C1 15 00 00 xx AA AA yy CD CD |
| Screen On | DD FF 00 07 C1 31 00 00 xx 00 yy BB CC | DDFF0007C13100000100F6BBCC | AB AB 00 07 C1 31 00 00 xx 00 yy CD CD |
| Screen Off | DD FF 00 07 C1 31 00 00 xx 01 yy BB CC | DDFF0007C13100000101F7BBCC | AB AB 00 07 C1 31 00 00 xx 01 yy CD CD |
| Reboot | DD FF 00 06 C1 1E 00 00 xx yy BB CC | DDFF0006C11E000001D8BBCC | AB AB 00 06 C1 1E 00 00 xx yy CD CD |
| Set AC Power On Mode | DD FF 00 07 C1 FF 00 09 xx zz yy BB CC | DDFF0007C1FF0009010031BBCC | AB AB 00 07 C1 FF 00 09 xx zz yy CD CD |
| DP | DD FF 00 07 C1 08 00 01 xx 0C yy BB CC | DDFF0007C1080001010CC2BBCC | AB AB 00 07 C1 08 00 01 xx 0C yy CD CD |
| Type-C | DD FF 00 07 C1 08 00 01 xx 0B yy BB CC | DDFF0007C1080001010BC5BBCC | AB AB 00 07 C1 08 00 01 xx 0B yy CD CD |
| Front HDMI | DD FF 00 07 C1 08 00 01 xx 05 yy BB CC | DDFF0007C10800010105CBBBCC | AB AB 00 07 C1 08 00 01 xx 05 yy CD CD |
| Side HDMI | DD FF 00 07 C1 08 00 01 xx 06 yy BB CC | DDFF0007C10800010106C8BBCC | AB AB 00 07 C1 08 00 01 xx 06 yy CD CD |
| OPS | DD FF 00 07 C1 08 00 01 xx 04 yy BB CC | DDFF0007C10800010104CABBCC | AB AB 00 07 C1 08 00 01 xx 04 yy CD CD |
| Set Screen Aspect Ratio | DD FF 00 07 C1 35 00 00 xx zz yy BB CC<br>Once this command is set, reboot TV, it will show with expected ratio | ex: set screen ratio 90 degrees<br>DDFF0007C13500000109FBBBCC<br>zz = 00 - 0 degree, 01 - 90 degree | AB AB 00 07 C1 35 00 00 xx zz yy CD CD |
| Set Mute | DD FF 00 07 C1 26 00 00 xx 01 yy BB CC | DDFF0007C12600000101E0BBCC | AB AB 00 07 C1 26 00 00 xx 01 yy CD CD |
| Set Unmute | DD FF 00 07 C1 26 00 00 xx 00 yy BB CC | DDFF0007C12600000100E1BBCC | AB AB 00 07 C1 26 00 00 xx 00 yy CD CD |

| Description | Command (HEX Bytes) | Example (PC -> TV ID 01) | Command TV -> PC |
|---|---|---|---|
| Set Volume | DD FF 00 07 C1 27 00 00 xx zz yy BB CC | DDFF0007C12700000101E1BBCC<br>zz: volume range 0-100 | AB AB 00 07 C1 27 00 00 xx zz yy CD CD |
| Set Backlight Brightness | DD FF 00 08 C1 32 00 00 xx 06 zz<br>yy BB CC | ex: set brightness to 32 - zz = 0x20<br>DDFF0008C1320000010620DCBBCC | AB AB 00 08 C1 32 00 00 xx 06 zz CD CD |
| Set Backlight Brightness Auto Adjust | DD FF 00 07 C1 34 00 00 xx zz yy BB CC | ex: set brightness auto adjust on<br>DDFF0007C13400000100F3BBCC<br>zz = 00 - on, 01 - off | AB AB 00 07 C1 34 00 00 xx zz yy CD CD |
| Set Date | DD FF 00 09 C1 1C 00 00 xx zz zz zz yy BB CC | ex: set date to 23.Jan.2<br>DDFF0009C11C000001170102C1BBCC<br>zz zz zz = Year Month Day | AB AB 00 09 C1 1C 00 00 xx zz zz zz yy CD CD<br>zz zz zz = FF FF FF when error |
| Set Time | DD FF 00 09 C1 1D 00 00 xx zz zz zz yy BB CC | ex: set time to 12:25:2<br>DDFF0009C11D0000010C1902C3BBCC<br>zz zz zz = Hour Minute Second | AB AB 00 09 C1 1D 00 00 xx zz zz zz yy CD CD<br>zz zz zz = FF FF FF when error |
| Set Schedule for Power On | DD FF 00 09 C1 3E 00 00 xx tt zz zz yy BB CC | ex: power on at 9:10 every day<br>DDFF0009C13E00000101090AF5BBCC<br>tt = 00 - turn off schedule, 01 - everyday<br>zz zz = Hour Minute | AB AB 00 09 C1 3E 00 00 xx zz zz zz yy CD CD |
| Set Schedule for Power Off | DD FF 00 09 C1 3F 00 00 xx tt zz zz yy BB CC | ex: power off at 18:10 every day<br>DDFF0009C13F00000101120AEFBBCC<br>tt = 0 - turn off schedule, 1 - everyday<br>zz zz = Hour Minute | AB AB 00 09 C1 3F 00 00 xx zz zz zz yy CD CD |
| Set Brightness | DD FF 00 07 C1 36 00 00 xx zz yy BB CC<br>current source must be: DP, VGA, HDMI, PC, DVI | ex: set brightness to 32 - zz = 0x20<br>DDFF0007C13600000120D1BBCC | AB AB 00 07 C1 36 00 00 xx zz yy CD CD |
| Set Contrast | DD FF 00 07 C1 37 00 00 xx zz yy BB CC<br>current source must be: DP, VGA, HDMI, PC, DVI | ex: set contrast to 32 - zz = 0x20<br>DDFF0007C13700000120D0BBCC | AB AB 00 07 C1 37 00 00 xx zz yy CD CD |
| Set Sharpness | DD FF 00 07 C1 38 00 00 xx zz yy BB CC<br>current source must be: DP, VGA, HDMI, PC, DVI | ex: set sharpness to 32 - zz = 0x20<br>DDFF0007C13800000120DFBBCC | AB AB 00 07 C1 38 00 00 xx zz yy CD CD |
| Set Color Temperature | DD FF 00 07 C1 39 00 00 xx zz yy BB CC<br>current source must be: DP, VGA, HDMI, PC, DVI | ex: set colour temperature to 32 - zz = 0x20<br>DDFF0007C13900000120DEBBCC | AB AB 00 07 C1 39 00 00 xx zz yy CD CD |
| Set Noise Reduction | DD FF 00 07 C1 3A 00 00 xx zz yy BB CC | ex: set noise reduction to High - zz = 0x03<br>DDFF0007C13A00000103FEBBCC<br>zz = 01 - low, 02 - medium, 03 - high, 04 - auto, | AB AB 00 07 C1 3A 00 00 xx zz yy CD CD |

| Description | Command (HEX Bytes) | Example (PC -> TV ID 01) | Command TV -> PC |
|---|---|---|---|
| | current source must be: DP, VGA, HDMI, PC, DVI | 00 - off | |
| Set Image Scaling | DD FF 00 07 C1 3B 00 00 xx zz yy BB CC<br>current source must be: DP, VGA,<br>HDMI, PC, DVI | ex: set image scaling to Full - zz = 0x03<br>DDFF0007C13B00000103FFBBCC<br>zz = 00 - full, 01 - 16:9, 02 - 4:3, 03 - scaling 1, 04 -<br>scaling 2, 05 - point to point | AB AB 00 07 C1 3B 00 00 xx zz yy CD CD |
| Set Picture Mode | DD FF 00 07 C1 0F 06 00 xx zz yy BB CC | ex: set picture mode to movie mode - zz = 0x03 DDFF0007C10F060001030CBBCC<br>zz = 00 - standard, 01 - bright, 02 - soft, 03 - Movie,<br>04 - Text, 5 - gaming 12 – natural | AB AB 00 07 C1 0F 06 00 xx zz yy CD CD |
| Set Sound Mode | DD FF 00 07 C1 FF 00 03 xx zz yy BB CC | ex: set sound mode to standard mode - zz = 0x00 DDFF0007C1FF000301003BBBCC<br>zz = 00 - standard，01 - music, 02 - news, 08 - movie, 10 - sports，20 - custom, 30 - voice, 40 - meeting | AB AB 00 07 C1 FF 00 03 xx zz yy CD CD |
| Set Eye Protection Mode | DD FF 00 07 C1 FF 00 1E xx zz yy BB CC | ex: set eye protection mode on - zz = 0x01<br>DDFF0007C1FF001E010127BBCC<br>zz = 00 - off, 01 - on | AB AB 00 07 C1 FF 00 1E xx zz yy CD CD |
| VGA Auto Adjust | DD FF 00 07 C1 01 00 00 xx yy BB CC<br>current source must be VGA | ex: VGA Auto Adjust<br>DDFF0007C101000001C6BBCC<br>zz = 00 - off, 01 – on | AB AB 00 07 C1 01 00 00 xx yy CD CD |
| Set anti-burn-in (image retention) | DD FF 00 07 C1 33 00 00 xx zz yy BB CC | ex: set anti-burn-in on<br>DDFF0007C13300000101F4BBCC<br>zz = 00 - off, 01 - on | AB AB 00 07 C1 33 00 00 xx zz yy CD CD |
| Set Power on delay | DD FF 00 07 C1 3C 00 00 xx zz yy BB CC | ex: set power on delay to 10s<br>DDFF0007C13C0000010AF1BBCC<br>zz = 00 - off, others - delay time, range: 2s - 255s | AB AB 00 07 C1 3C 00 00 xx zz yy CD CD |
| Set Video Wall | DD FF 00 09 C1 0A 00 00 xx zz zz<br>zz yy BB CC | ex: vertical 3 devices, horizontal 4 devices, device position: 6<br>DDFF0009C10A000001030406C2BBCC<br>zz: how many devices in vertical zz: how many devices in horizontal zz: current device position | AB AB 00 09 C1 0A 00 00 xx zz zz zz yy CD CD<br>1 2 3<br>4 5 6<br>7 8 9<br>10 11 12 |
| Set Static IP Address of LAN | DD FF 00 16 C1 1B 30 00 xx zz ...<br>zz yy BB CC | Ex: set IP 10.16.150.225, subnet mask: 255.255.248.0, gateway: 10.16.144.1, DNS: 10.16.144.2<br>DDFF0016C11B3000010A1096E1FFFFF8000A1090010A10900249BBCC | DD FF 00 16 C1 1B 30 00 xx zz ... zz yy BB CC |

| Description | Command (HEX Bytes) | Example (PC -> TV ID 01) | Command TV -> PC |
|---|---|---|---|
| | | zz .. zz - 16 bytes, IP address - 4 bytes, Subnet mask - 4 bytes, gateway - 4 bytes, DNS - 4 bytes | |
| Set USB Lock | DD FF 00 07 C1 FF 00 0E xx zz yy BB CC | ex: lock USB<br>DDFF0007C1FF000E010036BBCC<br>zz = 00 - lock USB, 01 - enable USB | AB AB 00 07 C1 FF 00 0E xx zz yy CD CD |
| Factory Reset | DD FF 00 06 C1 10 00 00 xx yy BB CC | DDFF0006C110000001D6BBCC | AB AB 00 06 C1 10 00 00 xx yy CD CD |
| Query TV Status | DD FF 00 06 C1 28 00 00 xx yy BB CC | DDFF0006C128000001EEBBCC | AB AB 00 0C 28 00 00 xx zz zz zz zz zz zz yy CD CD<br>zz: volume<br>zz zz: 05 01 - PC, 05 02 - DVI, 05 03 - DP, 05 04 - HDMI2, 05 05 - HDMI1, 08 01 - VGA<br>zz: 00 - power on, FF - power off zz: 01 - mute; 00 - unmute<br>zz: 00 - no signal, 01 - has signal |
| Query Screen Status | DD FF 00 06 C1 32 00 00 xx yy BB CC | DDFF0006C110000001D6BBCC | AB AB 00 07 C1 32 00 00 xx zz yy CD CD<br>zz: 00 - screen off; 01 - screen on |
| Query Source | DD FF 00 06 C1 1A 00 00 xx yy BB CC | DDFF0006C11A000001DCBBCC | AB AB 00 09 C1 1A 00 00 xx zz zz zz yy CD CD<br>zz zz zz - source, refer to user menu for source definition |
| Query SW Version | DD FF 00 06 C1 1B 00 00 xx yy BB CC | DDFF0006C11B000001DDBBCC | AB AB 00 09 C1 1B 00 00 xx zz zz zz yy CD CD<br>zz zz zz - Year Month Date |
| Query Backlight Brightness | DD FF 00 06 C1 3E 00 00 xx yy BB CC | DDFF0006C13E000001F8BBCC | AB AB 00 LL C1 3E 00 00 xx zz zz yy CD CD<br>zz:01 - bright，02 - soft, 03 - auto adjust, 04 - stereo frequency conversion，05 - Comfort frequency conversion，06 - custom<br>zz: when first zz is 06 custom, this byte means backlight brightness value: 0-30 |

| Description | Command (HEX Bytes) | Example (PC -> TV ID 01) | Command TV -> PC |
|---|---|---|---|
| | | | LL: when first zz is zz, LL = 08, otherwise, LL = 07 |
| Query Brightness | DD FF 00 06 C1 36 00 01 xx yy BB CC | DDFF0006C136000101F0BBCC | AB AB 00 07 C1 36 00 01 xx zz yy CD CD zz is the brightness value |
| Query Network Status | DD FF 00 06 C1 FF 00 16 xx yy BB CC | DDFF0006C1FF0016012FBBCC | AB AB 00 07 C1 FF 00 16 xx zz yy CD CD zz: 00 - no network connection; 01 - network connected |
| Query Sound Mode | DD FF 00 06 C1 FF 00 02 xx yy BB CC | DDFF0006C1FF0002013BBBCC | AB AB 00 07 C1 FF 00 02 xx zz yy CD CD zz = 00 - standard，01 - music, 02 - news, 08 - movie, 10 - sports，20 - custom, 30 - voice, 40 - meeting |
| Query AC Power On Status | DD FF 00 06 C1 FF 00 08 xx yy BB CC | DDFF0006C1FF00080131BBCC | AB AB 00 07 C1 FF 00 08 xx zz yy CD CD zz: 00 - power on; 01 - Last mode; 02 - standby |
| Query IP Address | DD FF 00 06 C1 1B 20 00 xx yy BB CC | DDFF0006C11B200001FDBBCC | AB AB 00 16 C1 1B 20 00 xx zz ... zz yy CD CD zz zz zz zz - IP address zz zz zz zz - Subnet mask zz zz zz zz Gateway zz zz zz zz - DNS |
| Query Device Temperature | DD FF 00 06 C1 FE 00 00 xx yy BB CC | DDFF0006C1FE00000138BBCC | AB AB 00 07 C1 FE 00 00 xx zz yy CD CD zz: temperature in centigrade |
| Query Eye Protection Mode | DD FF 00 06 C1 FF 00 1D xx yy BB CC | DDFF0006C1FF001D0124BBCC | AB AB 00 07 C1 FF 00 1D xx zz yy CD CD zz: 00 - Off; 01 - On |
| Query SN | DD FF 00 06 C1 FF 00 0B xx yy BB CC | DDFF0006C1FF000B0132BBCC | AB AB 00 1D C1 FF 00 0B xx zz...zz yy CD CD zz .. zz: 23 bytes |
| Query Devicd ID | DD FF 00 06 C1 FF 00 0D xx yy BB CC | DDFF0006C1FF000D0134BBCC | AB AB 00 26 C1 FF 00 0D xx zz...zz yy CD CD zz .. zz: 32 bytes |
| Query MAC Address | DD FF 00 06 C1 6C 00 00 xx yy BB CC | DDFF0006C16C000001AABBCC | AB AB 00 0E C1 6C 00 00 xx zz...zz yy CD CD zz .. zz: 8 bytes |

| Description | Command (HEX Bytes) | Example (PC -> TV ID 01) | Command TV -> PC |
|---|---|---|---|
| Send Remote Controller Key Code | DD FF 00 08 C1 17 00 00 xx zz zz yy BB CC | ex: send menu key: zz zz = 00 00<br>DDFF0008C1170000010000DFBBCC<br>zz zz = 00 00 - Menu; 00 01 - UP, 00 02 - DOWN, 00 03 - LEFT, 00 04 - RIGHT，00 05 - OK，00 06 - Return, 00 07 - Source | N/A |
| Open Setting Menu | DD FF 00 06 C1 41 00 00 xx yy BB CC | DDFF0006C14100000187BBCC | AB AB 00 06 C1 41 00 00 xx yy CD CD |
| Open Home | DD FF 00 06 C1 FF 00 1A xx yy BB CC | DDFF0006C1FF001A0123BBCC | AB AB 00 06 C1 FF 00 1A xx yy CD CD |
| Open CMS | DD FF 00 06 C1 FF 00 13 xx yy BB CC | DDFF0006C1FF0013012aBBCC | AB AB 00 06 C1 FF 00 13 xx yy CD CD |
| Open ScreenShare | DD FF 00 06 C1 43 00 00 xx yy BB CC | DDFF0006C14300000185BBCC | AB AB 00 06 C1 43 00 00 xx yy CD CD |
| Turn on Hotspot | DD FF 00 06 C1 44 00 00 xx yy BB CC | DDFF0006C14400000182BBCC | AB AB 00 06 C1 44 00 00 xx yy CD CD |
| Take Screenshot | DD FF 00 06 C1 4B 00 00 xx yy BB CC | DDFF0006C14B0000018DBBCC | AB AB 00 06 C1 4B 00 00 xx yy CD CD |
| Freeze Screen | DD FF 00 06 C1 0F 08 00 xx zz yy BB CC | DDFF0006C10F08000101E2BBCC<br>zz = 01 - freeze; 00 - unfreeze | AB AB 00 06 C1 0F 08 00 xx zz yy CD CD |

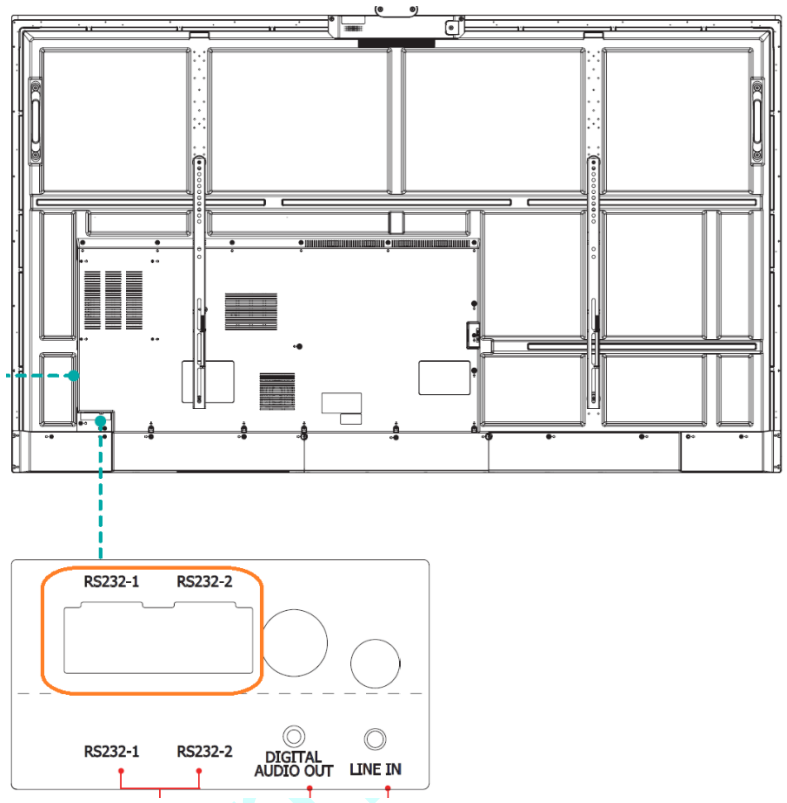
## Interactive Digital Board – DE Series

| Product Series | Android | Product Model | Firmware Version |
|---|---|---|---|
| DE | 13.0 | 65MR6DE | O0412 |
| | | 65MR6DE (0001) | O0412 |
| | | 75MR6DE | O0412 |
| | | 75MR6DE (0001) | O0412 |
| | | 86MR6DE | O0412 |
| | | 86MR6DE (0001) | O0412 |

## Connecting to the Display

Instructions on how to connect the RS232 cable between the Hisense interactive digital board – DE series and the controlling device. Include diagrams of RS232 pin configuration and types of connections. Specify recommended cable types and lengths.

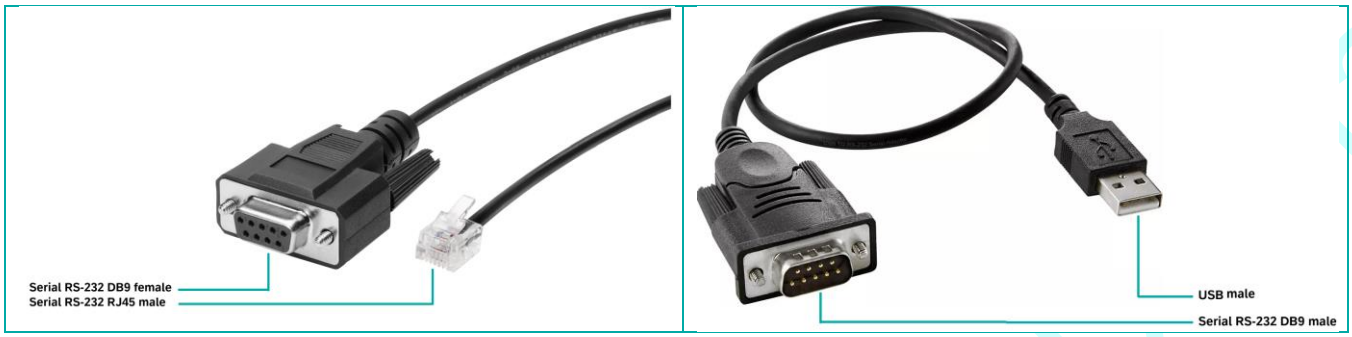
## RS232 Port



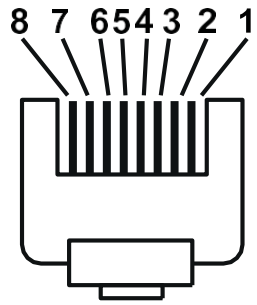
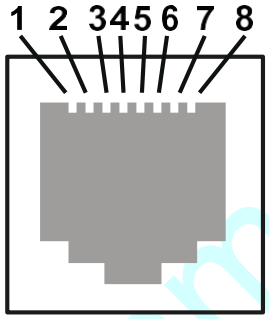

## Connectors

Choose the appropriate cable for using RS232 connections, you need to consider several factors related to the product model and its specific requirements. Here are some example for the connectors which might be required. Check the content of the product to validate whether the cable is included. Prepare the necessary cables in advance to ensure that the connection of RS232 can be communicated.

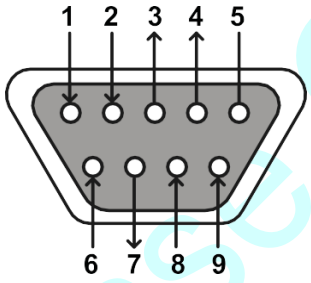
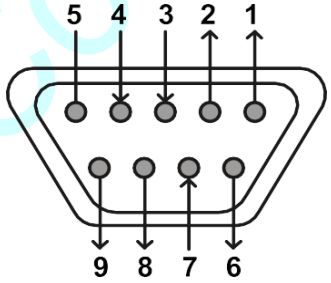
| RS232 DB9 female to RJ45 male cable | RS232 DB9 male to USB male cable |
|---|---|




## Pin Configuration

| RJ45 Male | RJ45 Female | Pin | Signal |
|---|---|---|---|
|  |  | 1 | |
| | | 2 | |
| | | 3 | |
| | | 4 | GND |
| | | 5 | RX |
| | | 6 | |
| | | 7 | TX |
| | | 8 | |



| DB9 Male | DB9 Female | Pin | Signal |
|---|---|---|---|
|  |  | 1 | |
| | | 2 | RX |
| | | 3 | TX |
| | | 4 | |
| | | 5 | GND |
| | | 6 | |
| | | 7 | |
| | | 8 | |

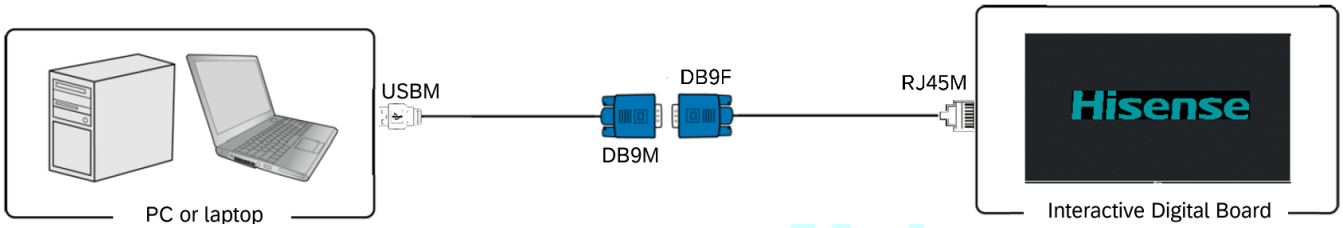


## Wiring Arrangement

| Pinout Connection | |
|---|---|
| RJ45 | DB9 |
| 1 | |
| 2 | |

| | |
|---|---|
| 3 | |
| 4 | 5 |
| 5 | 3 |
| 6 | |
| 7 | 2 |
| 8 | |

## Connection Diagram




*The RS232 standard suggests a maximum cable length of 50 feet (15 meters) at standard baud rates. The type of RS232 cable used between devices can vary significantly depending on the specific ports and connectors of the devices being connected. You may follow the diagram above as a reference.*

## RS232 Communication Settings

| Parameters | Value |
|---|---|
| Baud Rate | 9600 |
| Data Bits | 8 |
| Parity | none |
| Stop Bits | 1 |
| Flow Control | none |

## Command Protocols

This sections outlines the structure and format of commands to be sent to the display. It provides a list of commands and codes for various functions such as power, input selection, volume control, brightness adjustment, and status inquiries.

## Command String

### PC to Display

This section defines the command string while sending it from a PC to a Hisense display.

You can find the byte indication for each string:

| Header (2 Bytes) | | Length (2 Bytes) | | Command (4 Bytes) | | | | Monitor ID (1 Byte) | Data (N Bytes) | | | Checksum (1 Bytes) | End (2 Bytes) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DD | FF | | | | | | | | | | | | BB | CC |

### Display to PC

This section defines the response string from a display to a host controller, after the host controller sends a command, typically serves as an acknowledgment or status report.

*There is no response message from the PC when the wrong ID address is being used.*

You can find the byte indication for each string:

| Header (2 Bytes) | | Length (2 Bytes) | | Command (4 Bytes) | | | | Monitor ID (1 Byte) | Data (N Bytes) | | | Checksum (1 Bytes) | End (2 Bytes) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AB | AB | | | | | | | | | | | | CD | CD |

## Command Table

| Description | Command (HEX Bytes) | Example (PC -> TV ID 01) | Command TV -> PC |
|---|---|---|---|
| Power On | DD FF 00 08 C1 15 00 00 xx BB BB yy BB CC | DDFF0008C115000001BBBBDDBBCC | AB AB 00 08 C1 15 00 00 xx BB BB yy CD CD<br>When TV is in standby sate, send this command will get one feedback from TV, once TV starts up,<br>it will send feedback again. |
| Power Off | DD FF 00 08 C1 15 00 00 xx AA AA yy BB CC | DDFF0008C115000001AAAADDBBCC | AB AB 00 08 C1 15 00 00 xx AA AA yy CD CD |
| Screen Off | DD FF 00 07 C1 31 00 00 xx 00 yy BB CC | DDFF0007C13100000100F6BBCC | AB AB 00 07 C1 31 00 00 xx 00 yy CD CD |

| Description | Command (HEX Bytes) | Example (PC -> TV ID 01) | Command TV -> PC |
|---|---|---|---|
| Screen On | DD FF 00 07 C1 31 00 00 xx 01 yy BB CC | DDFF0007C131000000101F7BBCC | AB AB 00 07 C1 31 00 00 xx 01 yy CD CD |
| Reboot | DD FF 00 06 C1 1E 00 00 xx yy BB CC | DDFF0006C11E000001D8BBCC | AB AB 00 06 C1 1E 00 00 xx yy CD CD |
| Set AC Power On Mode | DD FF 00 07 C1 FF 00 09 xx zz yy BB CC | DDFF0007C1FF0009010031BBCC | AB AB 00 07 C1 FF 00 09 xx zz yy CD CD |
| Front HDMI | DD FF 00 07 C1 08 00 00 xx 1A yy BB CC | DDFF0007C1080000011AD5BBCC | AB AB 00 07 C1 08 00 00 xx 17 yy CD CD |
| Side HDMI1 | DD FF 00 07 C1 08 00 00 xx 24 yy BB CC | DDFF0007C10800000124EBBBCC | AB AB 00 07 C1 08 00 00 xx 0E yy CD CD |
| Side HDMI2 | DD FF 00 07 C1 08 00 00 xx 25 yy BB CC | DDFF0007C10800000125EABBCC | AB AB 00 07 C1 08 00 00 xx 0F yy CD CD |
| PC Input | DD FF 00 07 C1 08 00 00 xx 0C yy BB CC | DDFF0007C1080000010CC3BBCC | AB AB 00 07 C1 08 00 00 xx 0C yy CD CD |
| Type-c Input | DD FF 00 07 C1 08 00 00 xx 1C yy BB CC | DDFF0007C1080000011CD3BBCC | AB AB 00 07 C1 08 00 00 xx 17 yy CD CD |
| Set Mute | DD FF 00 07 C1 26 00 00 xx 01 yy BB CC | DDFF0007C12600000101E0BBCC | AB AB 00 07 C1 26 00 00 xx 01 yy CD CD |
| Set Unmute | DD FF 00 07 C1 26 00 00 xx 00 yy BB CC | DDFF0007C12600000100E1BBCC | AB AB 00 07 C1 26 00 00 xx 00 yy CD CD |
| Set Volume | DD FF 00 07 C1 27 00 00 xx zz yy BB CC | DDFF0007C12700000101E1BBCC<br>zz: volume range 0-100 | AB AB 00 07 C1 27 00 00 xx zz yy CD CD |
| Set Backlight Brightness | DD FF 00 08 C1 32 00 00 xx 06 zz yy BB CC | ex: set brightness to 32 - zz = 0x20<br>DDFF0008C132000001062 0DCBBCC | AB AB 00 08 C1 32 00 00 xx 06 zz CD CD |
| Set Backlight Brightness Auto Adjust | DD FF 00 07 C1 34 00 00 xx zz yy BB CC | ex: set brightness auto adjust on<br>DDFF0007C13400000100F3BBCC<br>zz = 00 - on, 01 - off | AB AB 00 07 C1 34 00 00 xx zz yy CD CD |
| Set Date | DD FF 00 09 C1 1C 00 00 xx zz zz zz yy BB CC | ex: set date to 23.Jan.2<br>DDFF0009C11C000001170102C1BBCC<br>zz zz zz = Year Month Day | AB AB 00 09 C1 1C 00 00 xx zz zz zz yy CD CD zz zz zz = FF FF FF when error |
| Set Time | DD FF 00 09 C1 1D 00 00 xx zz zz zz yy BB CC | ex: set time to 12:25:2<br>DDFF0009C11D0000010C1902C3BBCC<br>zz zz zz = Hour Minute Second | AB AB 00 09 C1 1D 00 00 xx zz zz zz yy CD CD zz zz zz = FF FF FF when error |
| Set Schedule for Power On | DD FF 00 09 C1 3E 00 00 xx tt zz zz yy BB CC | ex: power on at 9:10 every day<br>DDFF0009C13E00000101090AF5BBCC<br>tt = 00 - turn off schedule, 01 - everyday zz zz = Hour Minute | AB AB 00 09 C1 3E 00 00 xx zz zz zz yy CD CD |
| Set Schedule for Power Off | DD FF 00 09 C1 3F 00 00 xx tt zz zz yy BB CC | ex: power off at 18:10 every day<br>DDFF0009C13F00000101120AEFBBCC<br>tt = 0 - turn off schedule, 1 - everyday zz zz = Hour Minute | AB AB 00 09 C1 3F 00 00 xx zz zz zz yy CD CD |

| Description | Command (HEX Bytes) | Example (PC -> TV ID 01) | Command TV -> PC |
|---|---|---|---|
| Set Brightness | DD FF 00 07 C1 36 00 00 xx zz yy BB CC<br><br>current source must be: DP, VGA, HDMI, PC, DVI | ex: set brightness to 32 - zz = 0x20<br>DDFF0007C13600000120D1BBCC | AB AB 00 07 C1 36 00 00 xx zz yy CD CD |
| Set Contrast | DD FF 00 07 C1 37 00 00 xx zz yy BB CC<br><br>current source must be: DP, VGA, HDMI, PC, DVI | ex: set contrast to 32 - zz = 0x20<br>DDFF0007C13700000120D0BBCC | AB AB 00 07 C1 37 00 00 xx zz yy CD CD |
| Set Sharpness | DD FF 00 07 C1 38 00 00 xx zz yy BB CC<br><br>current source must be: HDMI, PC, Type-c | ex: set sharpness to 32 - zz = 0x20<br>DDFF0007C13800000120DFBBCC | AB AB 00 07 C1 38 00 00 xx zz yy CD CD |
| Set Color Temperature | DD FF 00 07 C1 39 00 00 xx zz yy BB CC<br>current source must be: HDMI, PC, Type-c | ex: set colour temperature to standard<br>DDFF0007C13900000100FEBBCC<br>zz = 00 - standard, 01 -cold, 02 - slightly cold, 03 - slightly warm, 04 - warm | AB AB 00 07 C1 39 00 00 xx zz yy CD CD |
| Set Noise Reduction | DD FF 00 07 C1 3A 00 00 xx zz yy BB CC<br><br>current source must be: HDMI, PC, Type-c | ex: set noise reduction to High - zz = 0x03<br>DDFF0007C13A00000103FEBBCC<br>zz = 01 - low, 02 - medium, 03 - high, 00 – off | AB AB 00 07 C1 3A 00 00 xx zz yy CD CD |
| Set Picture Mode | DD FF 00 07 C1 0F 06 00 xx zz yy BB CC | ex: set picture mode to movie mode - zz = 0x03<br>DDFF0007C10F060001030CBBCC<br>zz = 00 - standard, 01 - movie, 04 - text, 7 - custom 12 – frame display | AB AB 00 07 C1 0F 06 00 xx zz yy CD CD |
| Set Sound Mode | DD FF 00 07 C1 FF 00 03 xx zz yy BB CC | ex: set sound mode to standard mode - zz = 0x00<br>DDFF0007C1FF000301003BBBCC<br>zz = 00 - standard, 01 - music, 08 - movie, 20 - custom, 40 - meeting | AB AB 00 07 C1 FF 00 03 xx zz yy CD CD |
| Set Eye Protection Mode | DD FF 00 07 C1 FF 00 1E xx zz yy BB CC | ex: set eye protection mode on - zz = 0x01<br>DDFF0007C1FF001E010127BBCC<br>zz = 00 - off, 01 - on | AB AB 00 07 C1 FF 00 1E xx zz yy CD CD |
| Set Static IP Address of LAN | DD FF 00 16 C1 1B 30 00 xx zz … zz yy BB CC | Ex: set IP 10.16.150.225, subnet mask: 255.255.248.0, gateway: 10.16.144.1, DNS: 10.16.144.2<br>DDFF0016C11B3000010A1096E1FFFFF80 00A1090010A10900249BBCC | DD FF 00 16 C1 1B 30 00 xx zz … zz yy BB CC |

| Description | Command (HEX Bytes) | Example (PC -> TV ID 01) | Command TV -> PC |
|---|---|---|---|
| | | zz .. zz - 16 bytes, IP address - 4 bytes, Subnet mask - 4 bytes, gateway - 4 bytes, DNS - 4 bytes | |
| Set USB Lock | DD FF 00 07 C1 FF 00 0E xx zz yy BB CC | ex: lock USB DDFF0007C1FF000E010036BBCC<br>zz = 00 - lock USB, 01 - enable USB | AB AB 00 07 C1 FF 00 0E xx zz yy CD CD |
| Factory Reset | DD FF 00 06 C1 10 00 00 xx yy BB CC | DDFF0006C110000001D6BBCC | AB AB 00 06 C1 10 00 00 xx yy CD CD |
| Query TV Status | DD FF 00 06 C1 28 00 00 xx yy BB CC | DDFF0006C128000001EEBBCC | AB AB 00 0C 28 00 00 xx zz zz zz zz zz zz yy CD CD<br>zz: volume<br>zz zz: 05 01 - PC, 05 06 – side HDMI1, 05 07 –<br>side HDMI2, 05 08 – front HDMI1, 05 09 – Type-c<br>zz: 00 - power on, FF - power off zz: 01 - mute; 00 - unmute<br>zz: 00 - no signal, 01 - has signal |
| Query Screen Status | DD FF 00 06 C1 32 00 01 xx yy BB CC | DDFF0006C132000101F5BBCC | AB AB 00 07 C1 32 00 01 xx zz yy CD CD<br>zz: 00 - screen off; 01 - screen on |
| Query Source | DD FF 00 06 C1 1A 00 00 xx yy BB CC | DDFF0006C11A000001DCBBCC | AB AB 00 09 C1 1A 00 00 xx zz zz zz yy CD CD zz zz zz - source, refer to user menu for source defintion |
| Query SW Version | DD FF 00 06 C1 1B 00 00 xx yy BB CC | DDFF0006C11B000001DDBBCC | AB AB 00 09 C1 1B 00 00 xx zz zz zz yy CD CD zz zz zz - Year Month Date |
| Query Backlight Brightness | DD FF 00 06 C1 3E 00 24 xx yy BB CC | DDFF0006C13E002401DCBBCC | AB AB 00 LL C1 3E 00 00 xx zz zz yy CD CD<br>zz:01 - bright, 02 - soft, 03 - auto adjust, 04 - stereo frequency conversion, 05 - Comfort frequency conversion, 06 - custom<br>zz: when first zz is 06 custom, this byte means backlight brightness value: 0-30<br>LL: when first zz is zz, LL = 08, otherwise, LL = 07 |
| Query Brightness | DD FF 00 06 C1 36 00 01 xx yy BB CC | DDFF0006C136000101F1BBCC | AB AB 00 07 C1 36 00 01 xx zz yy CD CD<br>zz is the brightness value |

| Description | Command (HEX Bytes) | Example (PC -> TV ID 01) | Command TV -> PC |
|---|---|---|---|
| Query Network Status | DD FF 00 06 C1 FF 00 16 xx yy BB CC | DDFF0006C1FF0016012FBBCC | AB AB 00 07 C1 FF 00 16 xx zz yy CD CD<br>zz: 00 – no network connection; 01 – network connected |
| Query Sound Mode | DD FF 00 06 C1 FF 00 02 xx yy BB CC | DDFF0006C1FF0002013BBBCC | AB AB 00 07 C1 FF 00 02 xx zz yy CD CD<br>zz = 00 – standard, 01 – music, 08 – movie, 20 – custom, 40 – meeting |
| Query AC Power On Status | DD FF 00 06 C1 FF 00 08 xx yy BB CC | DDFF0006C1FF00080131BBCC | AB AB 00 07 C1 FF 00 08 xx zz yy CD CD<br>zz: 00 – power on; 01 – Last mode; 02 – standby |
| Query IP Address | DD FF 00 06 C1 1B 20 00 xx yy BB CC | DDFF0006C11B200001FDBBCC | AB AB 00 16 C1 1B 20 00 xx zz … zz yy CD CD zz zz zz zz – IP address<br>zz zz zz zz – Subnet mask zz zz zz zz Gateway<br>zz zz zz zz – DNS |
| Query Eye Protection Mode | DD FF 00 06 C1 FF 00 1D xx yy BB CC | DDFF0006C1FF001D0124BBCC | AB AB 00 07 C1 FF 00 1D xx zz yy CD CD<br>zz: 00 – Off; 01 – On |
| Query SN | DD FF 00 06 C1 FF 00 0B xx yy BB CC | DDFF0006C1FF000B0132BBCC | AB AB 00 1D C1 FF 00 0B xx zz…zz yy CD CD zz .. zz: 23 bytes |
| Query Devicd ID | DD FF 00 06 C1 FF 00 0D xx yy BB CC | DDFF0006C1FF000D0134BBCC | AB AB 00 26 C1 FF 00 0D xx zz…zz yy CD CD zz .. zz: 32 bytes |
| Query MAC Address | DD FF 00 06 C1 6C 00 00 xx yy BB CC | DDFF0006C16C000001AABBCC | AB AB 00 0E C1 6C 00 00 xx zz…zz yy CD CD zz .. zz: 8 bytes |
| Send Remote Controller Key Code | DD FF 00 08 C1 17 00 00 xx zz zz yy BB CC | ex: send menu key: zz zz = 00 00<br>DDFF0008C1170000010000DFBBCC<br>zz zz = 00 00 – Menu; 00 01 – UP, 00 02 – DOWN, 00 03 – LEFT, 00 04 – RIGHT, 00 05 – OK, 00 06 – Return, 00 07 – Source | N/A |
| Open Setting Menu | DD FF 00 06 C1 41 00 00 xx yy BB CC | DDFF0006C14100000187BBCC | AB AB 00 06 C1 41 00 00 xx yy CD CD |
| Open Home | DD FF 00 06 C1 FF 00 1A xx yy BB CC | DDFF0006C1FF001A0123BBCC | AB AB 00 06 C1 FF 00 1A xx yy CD CD |
| Open CMS | DD FF 00 06 C1 FF 00 13 xx yy BB CC | DDFF0006C1FF0013012ABBCC | AB AB 00 06 C1 FF 00 13 xx yy CD CD |
| Open ScreenShare | DD FF 00 06 C1 43 00 00 xx yy BB CC | DDFF0006C14300000185BBCC | AB AB 00 06 C1 43 00 00 xx yy CD CD |
| Turn on Hotspot | DD FF 00 06 C1 44 00 00 xx yy BB CC | DDFF0006C14400000182BBCC | AB AB 00 06 C1 44 00 00 xx yy CD CD |

| Description | Command (HEX Bytes) | Example (PC -> TV ID 01) | Command TV -> PC |
|---|---|---|---|
| Take Screenshot | DD FF 00 06 C1 4B 00 00 xx yy BB CC | DDFF0006C14B0000018DBBCC | AB AB 00 06 C1 4B 00 00 xx yy CD CD |
| Freeze Screen | DD FF 00 06 C1 0F 08 00 xx zz yy BB CC | DDFF0006C10F08000101C1BBCC<br>zz = 01 - freeze; 00 – unfreeze | AB AB 00 06 C1 0F 08 00 xx zz yy CD CD |

## Troubleshooting Tips

If you're having trouble with RS232 communication between your PC and a HISENSE display, there are several steps you can take to troubleshoot the issue. Here's a comprehensive guide to help you diagnose and resolve common problems:

1. Check Physical Connections
   a. Cable Connections: Ensure that the RS232 cable is securely connected to both the USB-to-Serial adapter on your PC and the RS232 port on the HISENSE display.
   b. Correct Ports: Verify that the cable is plugged into the correct ports. The PC should be connected to the COM port created by the USB-to-Serial adapter, and the device should be connected to its designated RS232 input.
   c. Cable Type: Ensure you are using the correct type of RS232 cable (straight-through or null-modem) as required by the HISENSE display.
2. Verify COM Port Settings
   a. Device Manager (Windows): Open the Device Manager on your PC and locate the USB-to-Serial adapter under "Ports (COM & LPT)." Make sure the driver is installed correctly, and note the COM port number.
   b. COM Port Number: In your terminal software (Hercules or SSCOM), ensure that the correct COM port is selected.
   c. Port Conflicts: Ensure there are no conflicts with other devices using the same COM port.
3. Check Serial Communication Settings

a. Baud Rate: Verify that the baud rate setting in your terminal software matches the HISENSE display's expected baud rate. Common settings are 9600, 19200, 38400, etc.
b. Data Bits, Parity, Stop Bits, and Flow Control: Ensure that all these settings in your terminal software match those required by the HISENSE display. Refer to the device's user manual for the correct settings.
c. HEX Mode: Ensure your terminal software is set to HEX mode, not ASCII, so that commands are sent and received in the correct format.

4. Confirm Device ID and Commands
   a. Correct Device ID: Make sure the command you are sending includes the correct device ID. If you are broadcasting to all devices, use "00". For a specific device, use its unique ID (e.g., "01").
   b. Command Format: Double-check the format of the HEX commands you are sending. Ensure they are correctly formatted and include the necessary start and end bytes, if applicable.
   c. Checksum Calculation: If a checksum is required, ensure it is correctly calculated using the XOR method and included in the command string.
5. Test with Simple Commands
   a. Basic Commands: Start with simple, basic commands that are known to work universally (like power on/off or volume adjustment) to confirm communication.
   b. Command Response: Check if the device responds to these basic commands. If there is no response, there may be a connection or configuration issue.
6. Update Software and Firmware
   a. PC Software: Ensure that your terminal software (Hercules or SSCOM) is up to date.
   b. USB-to-Serial Driver: Check for any updates to the USB-to-Serial adapter driver and install them if available.

c. HISENSE display Firmware: Update the firmware of the HISENSE display to the latest version, as older firmware might have bugs that affect RS232 communication.

7. Test RS232 Port and Cable
   a. Cable Test: Test the RS232 cable with another known-working device to ensure it is functioning correctly.
   b. Loopback Test: Perform a loopback test on your USB-to-Serial adapter. To do this:
   c. Disconnect the RS232 cable from the HISENSE display.
   d. Short the TX (transmit) and RX (receive) pins on the RS232 connector.
   e. Send data from the terminal software. If you see the data echoed back, the USB-to-Serial adapter is working correctly.
8. Try Another Terminal Software
   a. Alternative Software: If you suspect an issue with your terminal software, try another program like Tera Term or PuTTY, which also supports HEX mode for RS232 communication.
9. Test with Another Device
   a. Different Device: If possible, try connecting to a different RS232-compatible device to see if the issue persists. This can help determine if the problem is with the HISENSE display or the PC setup.
10. Check Power and Device Settings
   a. Power Cycle: Restart both the HISENSE display and the PC. Sometimes a simple reboot can resolve connectivity issues.
   b. Device Configuration: Double-check the settings on the HISENSE display to ensure RS232 communication is enabled and properly configured.
11. Consult Documentation and Support
   a. User Manual: Refer to the HISENSE display manual for specific troubleshooting tips related to RS232 communication.

b. Support: Contact HISENSE support for assistance if you have followed all the steps and still encounter issues. Provide us with detailed information about your setup and the steps you've taken.

By systematically working through these troubleshooting steps, you should be able to diagnose and resolve most RS232 communication issues with your HISENSE display.

Hisense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