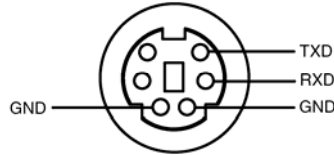


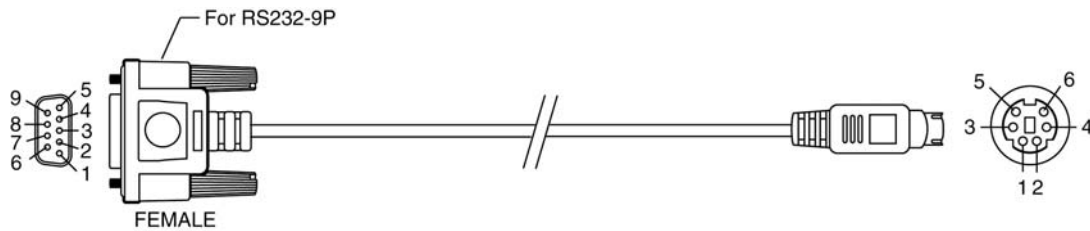


Dell™ 4220/4320 RS232 Protocol Document

- RS232 Projector Pin Assignment (Facing Projector)



- RS232 Serial Communication Cable Pin Assignment (Facing Cable)



◆ Pin Assignments

| RS232 | PIN DESCRIPTION | MINI DIN-6 |
|-------|-----------------|------------|
| 1 | | |
| 2 | TXD | 5 |
| 3 | RXD | 3 |
| 4 | | |
| 5 | GROUND | 1, 2 |
| 6 | | |
| 7 | Not Used | 6 |
| 8 | Not Used | 4 |
| 9 | | |

Note 1: The RS232 cable is not provided by Dell.

- RS232 Protocol
Communication Settings

| Connection Settings | Value |
|---------------------|-----------|
| Baud Rate | 19200 bps |
| Data Bits | 8 bits |
| Parity | None |
| Stop Bits | 1 bit |
| Flow control | None |

Command Types

To display the OSD menu and adjust the settings.

Control Command Syntax (From PC to Projector)

[H][AC][SoP][CRC][ID][SoM][COMMAND]

[H][AC][SoP][CRC][ID][SoM][COMMAND][Value]

Example: Power On Command (Send Low Byte Firstly)

Enter the following code:

0xbe, 0xef, 0x10, 0x05, 0x00, 0xc6, 0xff, 0x11, 0x11, 0x01, 0x00, 0x01

Header [H] ==> Fixed, "be (Low Byte), ef (High Byte)"

Address Code [AC] ==> Fixed, "10"

Size of Payload [SoP] ==> Byte size from MsgID to Command Code, "05 (Low Byte), 00 (High Byte)" or Byte size from MsgID to Value, "06 (Low Byte), 00 (High Byte)".

CRC16 [CRC] ==> CRC value, "c6 (Low Byte), ff (High Byte)"

MsgID [ID] ==> Fixed, "11 11"

MsgSize [SoM] ==> Byte size of Command Code, "01 (Low Byte), 00 (High Byte)" or Byte size of Command Code and Value, "02 (Low Byte), 00 (High Byte)"

Command Code [COMMAND] ==> "Power On" Command, "01"

Projector Response Message Table

Byte0 value:

0x00: Success

0x01: Invalid Command (on the control command list but no valid)

0x02: Error Command (includes CRC error and unknown commands)

Projector Response System Status

Byte0, Byte1, Byte2

Byte0: 0x00 (Success)

Byte1: 0xff (the Command Code of System Status)

Byte2: Return status

Ex: When the projector is in standby mode, the return status will be 0x01.

Projector Response Lamp Hour

Byte0, Byte1, Byte2, Byte3

Byte0: 0x00 (Success)

Byte1: 0x2f (the Command Code of Lamp Hour)

Byte2: LSB (Hex)

Byte3: MSB (Hex)

Ex: 800 ($3 \times 256 + 2 \times 16 = 800$) hours --> 0x00, 0x2f, 0x20, 0x03

Firmware Version Response

Byte0, Byte1, Byte2, Byte3...Byte7

Byte0: 0x00 (Success)

Byte1: 0x30 (the Command Code of Firmware Version)

Byte2...Byte7

Firmware version: 6 Bytes ASCII Code: "M0RXXX"

XXX: 000-999

Ex: Version M0R001 → "M0R001" → 0x4d, 0x30, 0x52, 0x30, 0x30, 0x31 (Success, the Command Code of FW Version, 6 Bytes ASCII Code: "M0RXXX")

Control Commands List

| Command Description | Header (WORD) | Address Code (BYTE) | Size Of The Payload (WORD) | CRC16 For The Entire Packet (WORD) | MsG ID (WORD) | MsG Size (WORD) | Command Code (BYTE) | Value (BYTE) | Comment |
|----------------------------------|---------------|---------------------|----------------------------|------------------------------------|---------------|-----------------|---------------------|--------------|--|
| Power On | 0xefbe | 0x10 | 0x0005 | 0xffc6 | 0x1111 | 0x0001 | 0x01 | | See Note 2 |
| Menu | 0xefbe | 0x10 | 0x0005 | 0xbfc7 | 0x1111 | 0x0001 | 0x02 | | |
| Up | 0xefbe | 0x10 | 0x0005 | 0x7e07 | 0x1111 | 0x0001 | 0x03 | | |
| Down | 0xefbe | 0x10 | 0x0005 | 0x3fc5 | 0x1111 | 0x0001 | 0x04 | | |
| Left | 0xefbe | 0x10 | 0x0005 | 0xfe05 | 0x1111 | 0x0001 | 0x05 | | |
| Right | 0xefbe | 0x10 | 0x0005 | 0xbe04 | 0x1111 | 0x0001 | 0x06 | | |
| R-sync | 0xefbe | 0x10 | 0x0005 | 0x7fc4 | 0x1111 | 0x0001 | 0x07 | | |
| Source Search | 0xefbe | 0x10 | 0x0005 | 0x3fc0 | 0x1111 | 0x0001 | 0x08 | | |
| Volume + | 0xefbe | 0x10 | 0x0005 | 0xfe00 | 0x1111 | 0x0001 | 0x09 | | |
| Volume - | 0xefbe | 0x10 | 0x0005 | 0xbe01 | 0x1111 | 0x0001 | 0x0a | | |
| Zoom In | 0xefbe | 0x10 | 0x0005 | 0x7fc1 | 0x1111 | 0x0001 | 0x0b | | |
| Zoom Out | 0xefbe | 0x10 | 0x0005 | 0x3e03 | 0x1111 | 0x0001 | 0x0c | | |
| Mute On | 0xefbe | 0x10 | 0x0005 | 0xffc3 | 0x1111 | 0x0001 | 0x0d | | |
| Freeze | 0xefbe | 0x10 | 0x0005 | 0xbfc2 | 0x1111 | 0x0001 | 0x0e | | |
| Hide | 0xefbe | 0x10 | 0x0005 | 0x7e02 | 0x1111 | 0x0001 | 0x0f | | |
| Video Mode | 0xefbe | 0x10 | 0x0005 | 0x3fca | 0x1111 | 0x0001 | 0x10 | | Toggle |
| V. Keystone Up | 0xefbe | 0x10 | 0x0005 | 0x7fcb | 0x1111 | 0x0001 | 0x13 | | |
| V. Keystone Down | 0xefbe | 0x10 | 0x0005 | 0x3e09 | 0x1111 | 0x0001 | 0x14 | | |
| Aspect Ratio (Original/4:3/Wide) | 0xefbe | 0x10 | 0x0005 | 0x7e08 | 0x1111 | 0x0001 | 0x17 | | Toggle |
| Power Off | 0xefbe | 0x10 | 0x0005 | 0x3e0e | 0x1111 | 0x0001 | 0x18 | | |
| Source-VGA Analog-A | 0xefbe | 0x10 | 0x0005 | 0xffcc | 0x1111 | 0x0001 | 0x19 | | |
| Source-S-Video | 0xefbe | 0x10 | 0x0005 | 0xbe1f | 0x1111 | 0x0001 | 0x22 | | |
| Source-Composite | 0xefbe | 0x10 | 0x0005 | 0x7fdf | 0x1111 | 0x0001 | 0x23 | | |
| Key Pad Lock On | 0xefbe | 0x10 | 0x0005 | 0x3e1d | 0x1111 | 0x0001 | 0x24 | | |
| Key Pad Lock Off | 0xefbe | 0x10 | 0x0005 | 0xffdd | 0x1111 | 0x0001 | 0x25 | | |
| Current Source | 0xefbe | 0x10 | 0x0005 | 0xbfde | 0x1111 | 0x0001 | 0x26 | | 0x00: No Source 0x01: VGA-A 0x02: VGA-B 0x03: HDMI 0x04: S-video 0x05: Composite 0x07: Wireless Display 0x08: USB Display 0x09: USB Viewer |
| V. Keystone Read | 0xefbe | 0x10 | 0x0005 | 0x3e18 | 0x1111 | 0x0001 | 0x28 | | |
| Auto Keystone Write | 0xefbe | 0x10 | 0x0006 | 0x1b28 | 0x1111 | 0x0002 | 0x29 | 0x00~0x01 | 0x00: No. Off 0x01: Yes. On |
| Lamp-Mode-ECO | 0xefbe | 0x10 | 0x0005 | 0xbfd9 | 0x1111 | 0x0001 | 0x2a | | |
| Lamp-Mode-Normal | 0xefbe | 0x10 | 0x0005 | 0x7e19 | 0x1111 | 0x0001 | 0x2b | | |
| Auto Source On | 0xefbe | 0x10 | 0x0005 | 0x3fdb | 0x1111 | 0x0001 | 0x2c | | |
| Auto Source Off | 0xefbe | 0x10 | 0x0005 | 0xfe1b | 0x1111 | 0x0001 | 0x2d | | |
| Factory Reset | 0xefbe | 0x10 | 0x0005 | 0xbe1a | 0x1111 | 0x0001 | 0x2e | | |
| Lamp-Hours | 0xefbe | 0x10 | 0x0005 | 0x7fda | 0x1111 | 0x0001 | 0x2f | | |
| Firmware Version | 0xefbe | 0x10 | 0x0005 | 0x3e12 | 0x1111 | 0x0001 | 0x30 | | |
| Auto Keystone Read | 0xefbe | 0x10 | 0x0005 | 0xffd2 | 0x1111 | 0x0001 | 0x31 | | 0x00: No. Off 0x01: Yes. On |
| Aspect Ratio Read | 0xefbe | 0x10 | 0x0005 | 0xbfd3 | 0x1111 | 0x0001 | 0x32 | | Feedback: 0x00: Original(1:1) 0x01: 4:3 0x02: Wide(16:9) |
| Projector Mode Write | 0xefbe | 0x10 | 0x0006 | 0x9ae3 | 0x1111 | 0x0002 | 0x33 | 0x01~0x04 | 0x01: Front 0x02: Front, Ceiling 0x03: Rear 0x04: Rear, Ceiling |
| Projector Mode Read | 0xefbe | 0x10 | 0x0005 | 0x3fd1 | 0x1111 | 0x0001 | 0x34 | | 0x01: Front 0x02: Front, Ceiling 0x03: Rear 0x04: Rear, Ceiling |
| Brightness Write | 0xefbe | 0x10 | 0x0006 | 0x1ae1 | 0x1111 | 0x0002 | 0x35 | 0x00~0x64 | Range (0x00~0x64) |
| Brightness Read | 0xefbe | 0x10 | 0x0005 | 0xbe10 | 0x1111 | 0x0001 | 0x36 | | Range (0x00~0x64) |
| Contrast Write | 0xefbe | 0x10 | 0x0006 | 0x9b20 | 0x1111 | 0x0002 | 0x37 | 0x00~0x64 | Range (0x00~0x64) |
| Contrast Read | 0xefbe | 0x10 | 0x0005 | 0x3fd4 | 0x1111 | 0x0001 | 0x38 | | Range (0x00~0x64) |
| Color Temperature Write | 0xefbe | 0x10 | 0x0006 | 0x1ae4 | 0x1111 | 0x0002 | 0x39 | 0x01~0x04 | 0x01: Low 0x02: Mid 0x03: High 0x04: Custom |
| Color Temperature Read | 0xefbe | 0x10 | 0x0005 | 0xbe15 | 0x1111 | 0x0001 | 0x3a | | 0x01: Low 0x02: Mid |

| | | | | | | | | | |
|------------------------|--------|------|--------|--------|--------|--------|------|----------------------|--|
| | | | | | | | | | 0x03: High 0x04: Custom |
| Saturation Write | 0xefbe | 0x10 | 0x0006 | 0x9b25 | 0x1111 | 0x0002 | 0x3b | 0x00~0x64 | Range (0x00~0x64) |
| Saturation Read | 0xefbe | 0x10 | 0x0005 | 0x3e17 | 0x1111 | 0x0001 | 0x3c | | Range (0x00~0x64) |
| Sharpness Write | 0xefbe | 0x10 | 0x0006 | 0x1b27 | 0x1111 | 0x0002 | 0x3d | 0x00~0x1f | Range (0x00~0x1f) |
| Sharpness Read | 0xefbe | 0x10 | 0x0005 | 0xbf66 | 0x1111 | 0x0001 | 0x3e | | Range (0x00~0x1f) |
| Tint Write | 0xefbe | 0x10 | 0x0006 | 0x9ae6 | 0x1111 | 0x0002 | 0x3f | 0x00~0x64 | Range (0x00~0x64) |
| Enter | 0xefbe | 0x10 | 0x0005 | 0x3ff6 | 0x1111 | 0x0001 | 0x40 | | |
| Tint Read | 0xefbe | 0x10 | 0x0005 | 0xfe36 | 0x1111 | 0x0001 | 0x41 | | Return INVALID Else Video |
| | | | | | | | | | 0x00: Presentation Mode 0x01: Bright Mode 0x02: Movie Mode 0x03: sRGB Mode 0x04: Custom Mode |
| Video Mode Read | 0xefbe | 0x10 | 0x0005 | 0xbe37 | 0x1111 | 0x0001 | 0x42 | | |
| | | | | | | | | | 0x01: RGB 0x02: YCbCr 0x03: YPbPr |
| Color Space Write | 0xefbe | 0x10 | 0x0006 | 0x9b07 | 0x1111 | 0x0002 | 0x43 | 0x01~0x03 | |
| Color Space Read | 0xefbe | 0x10 | 0x0005 | 0x3e35 | 0x1111 | 0x0001 | 0x44 | | 0x01: RGB 0x02: YCbCr 0x03: YPbPr |
| White Intensity Write | 0xefbe | 0x10 | 0x0006 | 0x1b05 | 0x1111 | 0x0002 | 0x45 | 0x00~0x0a | Range (0x00~0x0a) |
| White Intensity Read | 0xefbe | 0x10 | 0x0005 | 0xbff4 | 0x1111 | 0x0001 | 0x46 | | Range (0x00~0x0a) |
| H. Position Write | 0xefbe | 0x10 | 0x0006 | 0x1b00 | 0x1111 | 0x0002 | 0x49 | 0x00~0x64 | Range(0x00~0x64) See Note 3 |
| H. Position Read | 0xefbe | 0x10 | 0x0005 | 0xbff1 | 0x1111 | 0x0001 | 0x4a | | Return INVALID if not Analog RGB See Note 3 |
| V. Position Write | 0xefbe | 0x10 | 0x0006 | 0x9ac1 | 0x1111 | 0x0002 | 0x4b | 0x00~0x64 | Range(0x00~0x64) See Note 3 |
| V. Position Read | 0xefbe | 0x10 | 0x0005 | 0x3ff3 | 0x1111 | 0x0001 | 0x4c | | Return INVALID if not Analog RGB See Note 3 |
| | | | | | | | | | 0x01: English 0x02: German 0x03: French 0x04: Italian 0x05: Spanish 0x06: Polish 0x07: Swedish 0x08: Dutch 0x09: Iberian Portuguese 0x0a: Japanese 0x0b: T_Chinese 0x0c: S_Chinese 0x0d: Korean 0x0e: Russian 0x0f: Arabic |
| Current Language Write | 0xefbe | 0x10 | 0x0006 | 0x1ac3 | 0x1111 | 0x0002 | 0x4d | 0x01~0x0f | |
| | | | | | | | | | 0x01: English 0x02: German 0x03: French 0x04: Italian 0x05: Spanish 0x06: Polish 0x07: Swedish 0x08: Dutch 0x09: Iberian Portuguese 0x0a: Japanese 0x0b: T_Chinese 0x0c: S_Chinese 0x0d: Korean 0x0e: Russian 0x0f: Arabic |
| Current Language Read | 0xefbe | 0x10 | 0x0005 | 0xbe32 | 0x1111 | 0x0001 | 0x4e | | |
| Volume Read | 0xefbe | 0x10 | 0x0005 | 0x7ff2 | 0x1111 | 0x0001 | 0x4f | | Range (0x00~0x14) |
| Source-HDMI | 0xefbe | 0x10 | 0x0005 | 0x3e3a | 0x1111 | 0x0001 | 0x50 | | |
| Audio Source Write | 0xefbe | 0x10 | 0x0006 | 0xdb09 | 0x1111 | 0x0002 | 0x54 | 0x01,02,03, 04,07 | 0x01: Audio-A 0x02: Audio-B 0x03: Audio-C 0x04: HDMI 0x07: Wireless/LAN |
| Audio Source Read | 0xefbe | 0x10 | 0x0005 | 0xfe39 | 0x1111 | 0x0001 | 0x55 | | 0x01: Audio-A 0x02: Audio-B 0x03: Audio-C |

| | | | | | | | | | |
|-------------------------|--------|------|--------|--------|--------|--------|------|-----------|---|
| | | | | | | | | | 0x04: HDMI 0x07: Wireless/LAN |
| Password | 0xefbe | 0x10 | 0x0009 | 0xaaf9 | 0x1111 | 0x0005 | 0x56 | | 4byte: Original Password |
| Change Password | 0xefbe | 0x10 | 0x000d | 0x99fa | 0x1111 | 0x0009 | 0x57 | | 4byte: Original Password 4byte: New Password |
| H. Frequency | 0xefbe | 0x10 | 0x0005 | 0xfe3c | 0x1111 | 0x0001 | 0x59 | | (KHz) |
| V. Frequency | 0xefbe | 0x10 | 0x0005 | 0xbe3d | 0x1111 | 0x0001 | 0x5a | | (Hz) |
| H. Sync Polarity | 0xefbe | 0x10 | 0x0005 | 0x7ffd | 0x1111 | 0x0001 | 0x5b | | 0x01: Negative 0x02: Postivite |
| V. Sync Polarity | 0xefbe | 0x10 | 0x0005 | 0x3e3f | 0x1111 | 0x0001 | 0x5c | | 0x01: Negative 0x02: Postivite |
| Key Pad Lock State | 0xefbe | 0x10 | 0x0005 | 0xffff | 0x1111 | 0x0001 | 0x5d | | 0x01: Key Pad Lock On 0x02: Key Pad Lock Off |
| Mute Off | 0xefbe | 0x10 | 0x0005 | 0x7e3e | 0x1111 | 0x0001 | 0x5f | | |
| Get Mute State | 0xefbe | 0x10 | 0x0005 | 0xffee | 0x1111 | 0x0001 | 0x61 | | 0x00 : Mute Off 0x01 : Mute On |
| Freeze Off | 0xefbe | 0x10 | 0x0005 | 0xbfef | 0x1111 | 0x0001 | 0x62 | | |
| Unhide | 0xefbe | 0x10 | 0x0005 | 0x3fed | 0x1111 | 0x0001 | 0x64 | | |
| Get Hide State | 0xefbe | 0x10 | 0x0005 | 0xfe2d | 0x1111 | 0x0001 | 0x65 | | 0x00: Unhide 0x01: Hide |
| OSD Transparancy Write | 0xefbe | 0x10 | 0x0006 | 0x5adc | 0x1111 | 0x0002 | 0x66 | 0x00~0x0f | Range (0x00~0x0f) |
| OSD Transparancy Read | 0xefbe | 0x10 | 0x0005 | 0x7fec | 0x1111 | 0x0001 | 0x67 | | Range (0x00~0x0f) |
| Volume Write | 0xefbe | 0x10 | 0x0006 | 0xdb18 | 0x1111 | 0x0002 | 0x68 | 0x00~0x14 | Range (0x00~0x14) |
| Source-VGA Analog-B | 0xefbe | 0x10 | 0x0005 | 0xfe28 | 0x1111 | 0x0001 | 0x69 | | |
| Temp Alert | 0xefbe | 0x10 | 0x0005 | 0xbe29 | 0x1111 | 0x0001 | 0x6a | | 0x00: Normal 0x01: Abnormal |
| Exit Lockup | 0xefbe | 0x10 | 0x0005 | 0xffeb | 0x1111 | 0x0001 | 0x6d | | |
| Closed Captions | 0xefbe | 0x10 | 0x0006 | 0x7e2a | 0x1111 | 0x0002 | 0x6f | 0x00~0x04 | 0x00: Off 0x01: CC1 0x02: CC2 0x03: CC3 0x04: CC4 |
| Power Saving | 0xefbe | 0x10 | 0x0006 | 0xfe66 | 0x1111 | 0x0002 | 0x81 | | 0x00 : Off 0x1e : 30 min 0x3c : 60 min 0x5a : 90 min 0x78 : 120min |
| Quick Shutdown | 0xefbe | 0x10 | 0x0006 | 0xbe67 | 0x1111 | 0x0002 | 0x82 | 0x00~0x01 | 0x00: No 0x01: Yes |
| Lamp-Mode | 0xefbe | 0x10 | 0x0005 | 0x7fa7 | 0x1111 | 0x0001 | 0x83 | | 0x00: Eco 0x01: Normal |
| Operating Hours | 0xefbe | 0x10 | 0x0005 | 0x3e65 | 0x1111 | 0x0001 | 0x84 | | Hours (2 byte) |
| Password Off | 0xefbe | 0x10 | 0x0005 | 0xffa5 | 0x1111 | 0x0002 | 0x85 | | |
| Password Delete | 0xefbe | 0x10 | 0x0005 | 0xbfa4 | 0x1111 | 0x0002 | 0x86 | | |
| Speaker | 0xefbe | 0x10 | 0x0005 | 0x7e64 | 0x1111 | 0x0002 | 0x87 | 0x00~0x01 | 0x00: Off 0x01: On |
| Speaker Status | 0xefbe | 0x10 | 0x0005 | 0x3e60 | 0x1111 | 0x0001 | 0x88 | | 0x00: Off 0x01: On |
| Zoom Status | 0xefbe | 0x10 | 0x0005 | 0xffa0 | 0x1111 | 0x0001 | 0x89 | 0x00~0x0a | Range 0x00~0x0a 0x00 : Off 0x1e : 30 min 0x3c : 60 min 0x5a : 90 min 0x78 : 120min |
| Get Power Saving Status | 0xefbe | 0x10 | 0x0006 | 0xbfa1 | 0x1111 | 0x0002 | 0x8a | | |
| Source-Wireless Display | 0xefbe | 0x10 | 0x0005 | 0x7e61 | 0x1111 | 0x0001 | 0x8b | | |
| Source-Wireless Off | 0xefbe | 0x10 | 0x0005 | 0x3fa3 | 0x1111 | 0x0001 | 0x8c | | |
| Source-Wireless On | 0xefbe | 0x10 | 0x0005 | 0xfe63 | 0x1111 | 0x0001 | 0x8d | | |
| Source-USB Display | 0xefbe | 0x10 | 0x0005 | 0xbe62 | 0x1111 | 0x0001 | 0x8e | | |
| Source-USB Viewer | 0xefbe | 0x10 | 0x0005 | 0x7fa2 | 0x1111 | 0x0001 | 0x8f | | |
| System Status | 0xefbe | 0x10 | 0x0005 | 0x7e46 | 0x1111 | 0x0001 | 0xff | | 0x01: Standby 0x02: Warm Up 0x03: Power On 0x04: Cooling 0x05: Power Saving |



Note 2: After power on the projector, wait for 5 seconds before sending next command.

Note 3: The range will depend on VGA input resolution.

Note 4: If sending multiple commands, check that a response has been received from the projector before sending next command.

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