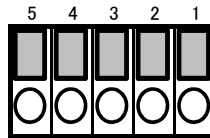


PX series RS-232C Specification sheet**CONFIDENTIAL****RS-232C Connector assign**

| Pin No. | Data |
|---------|-------|
| 1 | CTS ← |
| 2 | RX ← |
| 3 | TX → |
| 4 | RTS → |
| 5 | GND |

**RS-232C Transmission specification****RS-232C**

| | |
|-----------------|-------------|
| Baud rate: | 9600 bps |
| Data length: | 8bits |
| Parity: | No parity |
| Stop bit: | One bit |
| X on/off: | None |
| Communications: | Full duplex |

HDBaseT

| | |
|-----------------|-------------|
| Baud rate: | 9600 bps |
| Data length: | 8bits |
| Parity: | No parity |
| Stop bit: | One bit |
| X on/off: | None |
| Communications: | Full duplex |

Overview

In PX series, the side that issues commands such as computers is called a controller.

The receiving side is called the PX series. In the PX series, performed communication compliant with RS - 232C.

Flow control using XON / XOFF or RTS / CTS etc. is not performed.

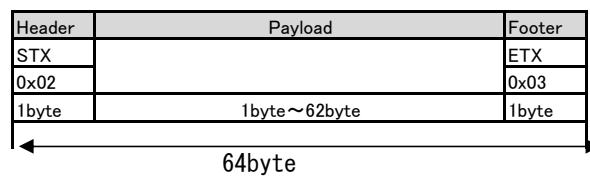
PX series transmission format

The basic unit of communication from the PX series is called a packet. The first byte of a packet is called a header.

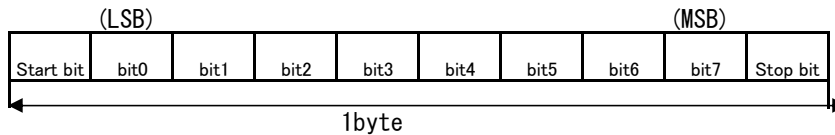
Represents the first packet.

The last byte of the packet is called the footer. 1 packet start from header to footer.

The maximum packet size is 64 bytes. Various commands called payload are entered between header and footer.



The data flow handled by the PX series is LSB first.



Command format

CONFIDENTIAL

The character string composing of the PX series command have unspecified limit all are ASCII code.
 Commands are indicated in the payload from header to footer.
 "Magic code", "main command", "sub command" from the head of the payload,
 depend on the command "parameter" follows.
 This order can not be changed.

The first payload represents the magic code in 1 byte. The magic code is "@".
 The main command (3 bytes) represents the command type. "BTN" representing execution as the command type.
 There are "MNS" for setting and "MNG" for acquisition of setting value.
 The subcommand (3 bytes) is an execution command. There are many types of execution commands in each function.
 Parameters are necessary or not depending on the execution command.
 Please check the specification of each execution command for details of parameters.

Add a semicolon ";" as a delimiter (separate) between the main command and subcommand.
 Separate is also used as a separator between subcommands and parameters.

| Header | MagicCode | Command | Delimiter | Subcommand | Delimiter | Parameter | Delimiter | Footer |
|--------|-----------|--------------|-----------|-------------------|-----------|-----------------|-----------|--------|
| STX | | Command type | | execution command | | | | ETX |
| 0x02 | @ | BTN | : | REC | : | O N | | 0x03 |
| 1byte | 1byte | 3byte | 1byte | 3byte | 1byte | variable length | 1byte | 1byte |

Depend on command
followed by parameters

e. g <0x02>@BTN:REC:ON<0x03>

Response

The response content is the same as the main command, and the subcommand is the same as the transmission command.

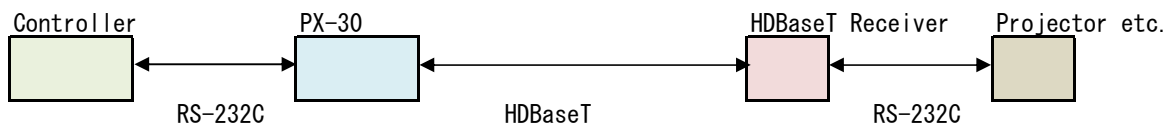
When the command is correctly accepted, the parameter of the response packet is set to "OK".
 If there is any error on the command, "ERR" character and error number are added to the parameter.

| Meaning | Response code |
|---------------------------------|---------------|
| Success | OK |
| Command acceptance not possible | ERR1 |
| Parameter error | ERR2 |
| Device abnormality | ERR3 |
| Undefined command | ERR4 |
| Capacity shortage | ERR5 |

Transfer packet to HDBaseT serial port

Except for the PX-30 packets, they are transferred to the RS-232C port on the HDBaseT receiving side through HDBaseT.
 This enables remote control of devices connected to PX-30 devices with HDBaseT.

It is also possible to remotely control the PX-30 serially from the serial port on the HDBaseT receiver side.



In the example above figure, it shows that the controller directly controls the projector connected to the HDBaseT via the PX-30.
 As an example, turn on the PX-30 power supply from the controller side via RS-232C, then connect the projector via HDBaseT.
 It is possible to turn on the power of peripheral devices using the RS-232C command.
 ※ The projector must be compatible with PJLink.

On the PX-30, if the magic code in the payload is "@", recognize it as a command for the PX-30.
 It will not transfer.

RS-232C Command Specifications (Run/Setting)

CONFIDENTIAL

| No | Command | Command Packet | Comments |
|----|--------------------------------|----------------------|--|
| 1 | Recording ON/OFF | @BTN:REC:xx | xx : ON / OFF |
| 2 | Save still image | @BTN:STL | |
| 3 | Freeze ON/OFF | @BTN:FRZ:xx | xx : ON / OFF / TGL |
| 4 | Rotation | @BTN:ROT:xx | xx : 0 / 90 / 180 / 270 / TGL |
| 5 | Zoom WIDE | @BTN:ZOM:WIDE:xx | xx : 0(SLOW) – 7(FAST), AUTO |
| | TELE | @BTN:ZOM:TELE:xx | xx : 0(SLOW) – 7(FAST), AUTO |
| | STOP | @BTN:ZOM:STOP | |
| | DIRECT | @BTN:ZOM:DIRECT:xx | xx : 0(WIDE) – 32128(TELE) |
| 6 | Focus FAR | @BTN:MFS:FAR:xx | xx : 0(SLOW) – 14(FAST), AUTO |
| | NEAR | @BTN:MFS:NEAR:xx | xx : 0(SLOW) – 14(FAST), AUTO |
| | STOP | @BTN:MFS:STOP | |
| | DIRECT | @BTN:MFS:DIRECT:xx | xx : 0(NEAR) – 19(FAR) |
| 7 | Auto focus | @BTN:AFS | |
| 8 | LED ON/OFF | @BTN:LSW:xx | xx : ON / OFF |
| 9 | Antireflection ON/OFF | @BTN:ATF:xx | xx : ON / OFF |
| 10 | Adjust brightness | @BTN:APT:xx | xx : 0(DARK) – 18(LIGHT), DEF(default : 11) |
| 11 | Power ON/OFF | @BTN:PWR:xx | xx : ON / OFF |
| 12 | Reboot | @BTN:RBT | |
| 13 | Set Input source | @BTN:SIN:xx | xx : CAM / HDMI1 / HDMI2 / RGB |
| 14 | Set resolution | @MNS:RES:xx | xx : AUTO / UHD(only PX-30) / FHD / HD / UXGA / XGA |
| 15 | Set viewing angle | @MNS:OIA:xx | xx : NORMAL(16:9) / FULL(4:3) |
| 16 | Set flicker-less mode | @MNS:FLK:xx | xx : 50 / 60 / OFF |
| 17 | Set ND filter ON/OFF | @MNS:NDF:xx | xx : ON / OFF |
| 18 | Set USB mode | @MNS:USB:xx | xx : UVC / STORAGE(Mass- storage) |
| 19 | Set Audio output | @MNS:ASW:xx | xx : EXT / HDMI / OFF |
| 20 | Adjust audio output volume | @MNS:AVL:xx | xx : 0(SMALL) – 10(LARGE), DEF(default : 5) |
| 21 | Adjust push sound volume | @MNS:OVL:xx | xx : 0(SMALL) – 5(LARGE), DEF(default : 3) |
| 22 | Set recoring video quality | @MNS:MQL:xx | xx : SUPERFINE / FINE / STANDARD / ECONOMY / FASTECONOMY |
| 23 | Set recording compression mode | @MNS:VCM:xx | xx : HEVC / H264 |
| 24 | Set recording mode | @MNS:RMD:xx | xx : NORMAL / LAPSE |
| 25 | Set time-lapse interval | @MNS:LTM:xx | xx : 1MIN / 10MIN / 30MIN / 1HOUR / 3HOUR / 6HOUR |
| 26 | Set auto power off | @MNS:POT:xx | xx : OFF / 30MIN / 1HOUR / 2HOUR / 3HOUR |
| 27 | Set language | @MNS:LAG:xx | xx : EN / JA / GE / FR / AR |
| 28 | Factory default | @MNS:FSV | |
| 29 | Iniialize SD card | @MNS:SFM | |
| 30 | Initialize USB flash memory | @MNS:UFM | |
| 31 | Set date & time | @MNS:TST:x1:x2 | x1 : YYYYMMDD |
| | | | x2 : hhmmss |
| 32 | Set rotation angle | @MNS:IRA:xx | xx : 90 / 180 |
| 33 | Set freeze image mode | @MNS:FCM:xx | xx : ON(FREEZE) / OFF(MOVE) * built-in display |
| 34 | Set IP address * only PX-30 | @MNS:NET:x1:x2:x3 | x1 : DHCP / STATIC |
| | | | x2 : IP address/subnet mask, e.g. 192.168.1.100/24 |
| | | | x3 : Gateway IP address |
| 35 | Set DNS sarver * only PX-30 | @MNS:DNS:x1:x2 | x1 : Primary DNS server |
| | | | x2 : Secondary DNS server |
| 36 | Set host name * only PX-30 | @MNS:HNM:xx | xx : Host name |
| 37 | Set auto power on | @MNS:APO:xx | xx : ON / OFF |
| 38 | Set AF mode | @MNS:AFM:xx | xx : ZOOM SYNC / ONCE |
| 39 | Set digital zoom ON/OFF | @MNS:EZM:xx | xx : ON / OFF |
| 40 | Set white blance mode | @MNS:WBL:xx | xx : AUTO / ONCE / F-LAMP / OUTDOOR / INDOOR |
| 41 | Set image mode | @MNS:IMD:xx | xx : STD / EMPHASIS / COLOR / W/B / DLP |
| 42 | Run mask function | @MNS:IMS:xx | xx : ON / OFF |
| 43 | Set mask position | @MNS:IMK:x1:x2:x3:x4 | x1 : 0 –128 start point x coodrinata |
| | | | x2 : 0 –128 start point y coodrinata |
| | | | x3 : 0 –128 end point x coodrinata |
| | | | x4 : 0 –128 end point y coodrinata |
| 44 | Adjust contour correct | @MNS:COC:xx | xx : 0 – 10, DEF(default : 5) |
| 45 | Adjust contrast | @MNS:CTR:xx | xx : 0 – 10, DEF(default : 5) |
| 46 | Set menu button mode | @MNS:SMB:xx | xx : ON / OFF(enable / disable) |

RS-232C Command specifications (Get setting)

CONFIDENTIAL

| No | Command | Command Packet | Response | Comments |
|----|--|----------------|--------------------------|--|
| 1 | Get resolution setting | @MNG:RES | @MNG:RES;xx | xx : AUTO / UHD / FHD / HD / UXGA / XGA |
| 2 | Get viewing angle setting | @MNG:OIA | @MNG:OIA;xx | xx : NORMAL(16:9) / FULL(4:3) |
| 3 | Get flicker-less setting | @MNG:FLK | @MNG:FLK;xx | xx : 50 / 60 / OFF |
| 4 | Get ND filter setting | @MNG:NDF | @MNG:NDF;xx | xx : ON / OFF |
| 5 | Get USB mode setting | @MNG:USB | @MNG:USB;xx | xx : UVC / STORAGE(Mass-storage) |
| 6 | Get audio output setting | @MNG:ASW | @MNG:ASW;xx | xx : EXT / HDMI / OFF |
| 7 | Get audio output volume | @MNG:AVL | @MNG:AVL;xx | xx : 0(SMALL) – 10(LARGE) |
| 8 | Get push sound volume | @MNG:OVL | @MNG:OVL;xx | xx : 0(SMALL) – 5(LARGE) |
| 9 | Get recording video quority setting | @MNG:MQL | @MNG:MQL;xx | xx : SUPERFINE / FINE / STANDARD / ECONOMY / FASTECONOMY |
| 10 | Get recording video compression | @MNG:VCM | @MNG:VCM;xx | xx : HEVC / H264 |
| 11 | Get recording mode | @MNG:RMD | @MNG:RMD;xx | xx : NORMAL / LAPSE |
| 12 | Get time-lapse interval setting | @MNG:LTM | @MNG:LTM;xx | xx : 1MIN / 10MIN / 30MIN / 1HOUR / 3HOUR / 6HOUR |
| 13 | Get auto power off setting | @MNG:POT | @MNG:POT;xx | xx : OFF / 30MIN / 1HOUR / 2HOUR / 3HOUR |
| 14 | Get language setting | @MNG:LAG | @MNG:LAG;xx | xx : EN / JA / GE / FR / AR |
| 15 | Get date & time setting | @MNG:TST | @MNG:TST;x1; x2 | x1 : YYYYMMDD x2 : hhmmss |
| 16 | Get rotation angle setting | @MNG:IRA | @MNG:IRA;xx | xx : 90 / 180 |
| 17 | Set freeze image mode | @MNG:FCM | @MNG:FCM;xx | xx : ON(FREEZE) / OFF(MOVE) |
| 18 | Get IP address setting * only PX-30 | @MNG:NET | @MNG:NET;x1; x2;x3 | x1 : DHCP / STATIC x2 : IP address/subnet mask, e.g. 192.168.1.100/24 x3 : Gateway IP address |
| 19 | Get DNS server setting * only PX-30 | @MNG:DNS | @MNG:DNS;x1; x2 | x1 : Primary DNS server x2 : Secondary DNS server |
| 20 | Get IP address config * return IP configuration by DHCP * only PX-30 | @MNG:NEA | @MNG:NEA;x1; x2 | x1 : IP address/subnet mask, e.g. 192.168.1.100/24 x2 : Gateway IP address |
| 21 | Get DNS config * return DNS configuration by DHCP * only PX-30 | @MNG:DNA | @MNG:DNA;x1; x2 | x1 : Primary DNS server x2 : Secondary DNS server |
| 22 | Get host name * only PX-30 | @MNG:HNM | @MNG:HNM;xx | xx : Host name |
| 23 | Get auto power on setting | @MNG:APO | @MNG:APO;xx | xx : ON / OFF |
| 24 | Get auro focus mode setting | @MNG:AFM | @MNG:AFM;xx | xx : ZOOM SYNC / ONCE |
| 25 | Get digital zoom setting | @MNG:EZM | @MNG:EZM;xx | xx : ON / OFF |
| 26 | Get white balance setting | @MNG:WBL | @MNG:WBL;xx | xx : AUTO / ONCE / F-LAMP / OUTDOOR / INDOOR |
| 27 | Get image mode setting | @MNG:IMD | @MNG:IMD;xx | xx : STD / EMPHASIS / COLOR / W/B / DLP |
| 28 | Get mask status | @MNG:IMS | @MNG:IMS;xx | xx : ON / OFF |
| 29 | Get mask position | @MNG:IMK | @MNG:IMK;x1; x2;x3;x4 | x1 : 0 –128 start point x coodinata x2 : 0 –128 start point y coodinata x3 : 0 –128 end point x coodinata x4 : 0 –128 end point y coodinata |
| 30 | Get contour correct value | @MNG:COC | @MNG:COC;xx | xx : 0 – 10 |
| 31 | Get contrast value | @MNG:CTR | @MNG:CTR;xx | xx : 0 – 10 |
| 32 | Get MAC address | @MNG:MAC | @MNG:MAC;xx | xx : MAC address |
| 33 | Get version information | @MNG:VER | @MNG:VER;x1; x2;x3;x4 | x1 : FW version x2 : FPGA(lens) FW version x3 : FPGA(main) FW version x4 : FPGA(panel) FW version |
| 34 | Get menu button mode | @MNG:SMB | @MNG:SMB;xx | xx : ON / OFF(enable / disable) |

RS-232C Command specifications (Get status)

CONFIDENTIAL

| No | Command | Command Packet | Response |
|----|---------------------------|----------------|---|
| 1 | Get mount status | @STG:MNT | @STG:MNT;xx xx : 0(no mounted), 1(SD), 2(USB), 3(Both) |
| 2 | Get recording status | @STG:REC | @STG:REC;xx xx : 0(no rec), 1(recording) |
| 3 | Get rotation status | @STG:ROT | @STG:ROT;xx xx : 0 / 90 / 180 / 270 |
| 4 | Get brightness status | @STG:APT | @STG:APT;xx xx : 0(DARK) - 18(LIGHT) |
| 5 | Get LED status | @STG:LSW | @STG:LSW;xx xx : 0(OFF) / 1(ON) |
| 6 | Get freeze status | @STG:FRZ | @STG:FRZ;xx xx : 0(OFF) / 1(ON) |
| 7 | Get antireflection status | @STG:ATF | @STG:ATF;xx xx : 0(OFF) / 1(ON) |
| 8 | Get zoom status | @STG:ZOM | @STG:ZOM;xx x1 : 0 - 32128(zoom position) |
| 9 | Get lens status | @STG:LEN | @STG:LEN;x1; x2;x3 x1 : 0(focus not working) / 1(focus working) |
| | | | x2 : 0(zoom not working) / 1(zoom working) |
| | | | x3 : 100 - 28800(magnification, Low 2 bits after decimal point) |

