

Description of the PIP-200's Communication Protocol (RS-232)

RS-232 communication with the PIP-200 is defined using a two byte protocol as defined below. Data is transferred at 9600 baud, with no parity, 8 data bits and 1 stop bit. The physical interface with the controller should be via a null-modem connection.

The protocol gives the user direct access to the SDA-9189X chip within the PIP-200, and also to the front-panel switches which control the picture-in-picture functions. Resetting internal memories is also possible.

| | | | | | | | | |
|----------------------|-----|----|----|----|-----|----|----|----|
| | MSB | | | | LSB | | | |
| 1 st byte | 0 | D7 | S | A4 | A3 | A2 | A1 | A0 |
| | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 2 nd byte | 1 | D6 | D5 | D4 | D3 | D2 | D1 | D0 |

1st BYTE: Bit 7 – defined as 0.
D7 – MSB of data (D0...D6 described in 2nd byte).
S – Send bit - 1 when PC sends information to address A4...A0.
- 0 when PC requests PIP-200 to download data of A4...A0.
A4...A0 – address (subaddress) of data in SDA-9189;
or set to 1F (hex) for access to a front-panel switch.

2nd BYTE: Bit 7 – defined as 1.
D6...D0 – Data to be sent to, or retrieved from SDA-9189X (D7 in first byte);
or D3...D0 is the front-panel switch number (if A4...A0 is set to 1F (hex)).

USING THE PROTOCOL

- To download data from the PC to the SDA-9189X
Set S=1, and send the data (D7...D0) to address (A4...A0) in the machine. The machine will reply by echoing back the two bytes sent to it. For example, to send 2D (hex) to address 14 (hex), set 1st byte as 00110100 (34 hex), and second byte as 10101101 (AD hex).
- To request the value of data in the SDA-9189X
Set S=0, and set the A4...A0 with the address of the requested data in the SDA-9189X. The machine will reply by sending the requested data (D7...D0) to the PC.
- To “press” (via RS-232) a front-panel switch on the PIP-200
Set S=1; A4...A0 = 1F (hex); and D3...D0 with the value of the switch to be “pressed” (switch numbers are defined below).
- To request the status of a front-panel led
Set S=0; A4...A0 = 1F (hex); and D3...D0 with the value of the switch whose led status is required (switch numbers are defined below). The PIP-200 replies by setting D6 high if the led is on, or low if the led is off.
- To reset the PIP-200 to its factory-settings
Set 1st byte = 3F (hex), and 2nd byte = FF (hex).

NOTE: If a switch is pressed which causes a front-panel led to change status, then the PIP-200 sends S=0; A4...A0 = 1F (hex); D6 = led status; and D3...D0 = switch number.
On initialisation (eg. on power-up), the PIP-200 sends 1F (hex), 80 (hex).

FRONT PANEL SWITCH NUMBERING

The switches on the front-panel of the machine, (as well as their internal leds, where applicable), are defined by the hexadecimal numbering system below:

| | | |
|--------|---|---|
| ON | - | 1 |
| WIPE | - | 2 |
| FREEZE | - | 3 |
| INVERT | - | 4 |
| SIZE | - | 5 |
| BORDER | - | 6 |
| MATTE | - | 7 |
| Y | - | 8 |
| R-Y | - | 9 |
| B-Y | - | A |
| COARSE | - | B |
| LEFT | - | C |
| UP | - | D |
| RIGHT | - | E |
| DOWN | - | F |

HEX CODES FOR FRONT PANEL SWITCHES

| | |
|---------|-------------|
| ON: | (7F 81 HEX) |
| WIPE: | (7F 82 HEX) |
| FREEZE: | (7F 83 HEX) |
| INVERT: | (7F 84 HEX) |
| SIZE: | (7F 85 HEX) |
| BORDER: | (7F 86 HEX) |
| MATTE: | (7F 87 HEX) |
| Y: | (7F 88 HEX) |
| R-Y: | (7F 89 HEX) |
| B-Y: | (7F 8A HEX) |
| COARSE: | (7F 8B HEX) |
| LEFT: | (7F 8C HEX) |
| UP: | (7F 8D HEX) |
| RIGHT: | (7F 8E HEX) |
| DOWN: | (7F 8F HEX) |