

# EXTERNAL CONTROL MANUAL

for Steinway & Sons processors

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## Introduction

The purpose of this document is to describe how the external control interface of the device works.

### Home Automation System Integration

The Steinway & Sons processors are compatible with home automation systems via the RS232 and network connectors on the rear socket panel. The processors's IR and trigger connections can also be programmed for use in a home automation system.

### Control Via Network

Open a TCP connection on port 84 and use the control protocol as described in this document. For control from a PC, use Telnet, Putty, or similar programs to open the TCP connection.

If you do not know the IP address of the processor on your local network, the processors supports Apple's Bonjour Discovery service, which must be on the computer you want to set up the processor with. The software is built-in as part of the Apple OS X operating system. For Windows operating systems, the software can be found at <http://www.apple.com/support/bonjour/>

The control protocol is announced via Bonjour as the service "slactrl".

Pressing the "OK" button on the remote and toggling through the "Info" of the unit will also display the current IP address of the unit.

The processor can also be controlled via the network by accessing [http://p100.local /](http://p100.local/) <http://p200.local> <http://p300.local> or <http://headunit.local> in your browser.

## **Control Via Serial Port**

The serial port on the processor is wired as a DTE, so for communication with a PC or similar, you will need a null modem adapter and gender changer.

The port settings should always be 8 data bits, no parity, one stop bit and no hardware handshake. The baud rate is 115200 bits per second. All commands and responses are in ASCII form.

When controlling the processor via the serial port, it can wake up even when the standby mode has been set to “deep sleep.” However, the processor will miss the first one or two characters transmitted when in deep sleep, because it needs to wake up first. So, in order to make sure the processor is ready for the command, send a few extra characters before an ON-command. Sending for instance “!!!POWERONMAIN” to turn on the processor will guarantee that the command is always received, even if it is in deep sleep.

## Control Protocol

### Commands

Every command starts with '!' character and ends with carriage return (ascii 0x0D, referred to in this document as <CR>). There are two types of commands, commands and status requests. Commands are used to emulate remote key presses or to set a certain volume etc. Status requests are used to query the current state of the controller (volume, current source etc.). Commands with invalid format are simply ignored. For example, sending a command !VOL(100)garbage!MUTEON<CR> will only result in volume being muted, because volume command is not terminated properly.

### Responses And Feedback Level

There are three levels of responsiveness, called feedback levels. Each level adds something new to the previous level. Feedback level can be set from the control interface with command "!VERB(X)<CR>" (X can be 0, 1 or 2). All responses start either with '!' (status messages) or '#' (echo messages) and end with <CR>.

Feedback level 0: Data is only sent when data is requested by status request command. For example command "!VOL?<CR>" would return "!VOL(XXX)<CR>", where "XXX" would be current volume.

Feedback level 1: Data is sent whenever any of the statuses listed below changes. The data format is the same as for responses to status request commands.

Feedback level 2: Each command is also echoed back with the '#' in front of the command instead of '!' character. For example command "!VOL?<CR>" would return "#VOL?<CR>!VOL(XXX)<CR>".

Status	Related status request command
Audio input	!AUDIN?<CR>
Audio processing mode	!AUDMODE?<CR>
Audio type	!AUDTYPE?<CR>
Mute	!MUTE?<CR>
Power	!POWER?<CR>
RP Focus Position	!RPFOC?<CR>
Voicing	!RPVOI?<CR>
Source	!SRC?<CR>
Video input	!VIDIN?<CR>
Video type	!VIDTYPE?<CR>
Volume	!VOL?<CR>
Multiview layout	!MVIEW?<CR>
Multiview active window	!MVIEWACTIVE?<CR>
Multiview sources	!MVIEWSRC?<CR>
Zone power	!POWERZONE2?<CR>
Zone audio input	!ZAUDIN?<CR>
Zone source	!ZSRC?<CR>
Zone user mute	!ZMUTE?<CR>
Zone volume	!ZVOL?<CR>

Table 1 Automatic status messages

## Commands

This chapter introduces all the different control protocol commands.

Command	Values	Description
!AUDIN?	X is the number of the active audio input – see list.	Returns currently selected audio input.
!AUDIO		Audio button
!AUDMODE-		Audio processing mode down button.
!AUDMODE?	X is the number of the currently active audio mode	Request audio processing mode.
!AUDMODE(X)	X is any of the numbers returned from !AUDMODE?	Set audio processing mode
!AUDMODE+		Audio processing mode up button.
!AUDMODEL?	N is the total number of available audio-modes. X is the number of the audio mode Name is a string describing audio mode X	Get list of audio processing modes.
!AUDTYPE?	Name is a string describing the current audio input type	Get input audio type. Returns a string with the type. (Still not final format.)
!BACK		Back button
!DEFVOL?	-990 to -200 (= -99.0 to -20.0 dB)	Requests default volume setting
!DEFVOL(OFF)		Turns off default volume (uses last used volume on boot instead)
!DEFVOL(X)	-990 to -200 (= -99.0 to -20.0 dB)	Sets default volume
!DEVICE?		Returns the name of the device. !DEVICE(MX160) for mx160.
!DIM-		Reduce brightness of the VFD display
!DIM?	0 = 100%, 1 = 75%, 2 = 50%, 3 = 25%	Request brightness of the VFD display.
!DIM(X)	0 = 100%, 1 = 75%, 2 = 50%, 3 = 25%	Set brightness of the VFD display.
!DIM+		Increase the brightness of the VFD display
!DIRD		Direction Down button
!DIRL		Direction Left button
!DIRR		Direction Right button
!DIRU		Direction Up button
!DTSDIALOG?	X = current setting. Signed value / 10 (eg. -10 = -1.0 dB)	Request the current setting of DTS Dialog Control
!DTSDIALOGAVAILABLE?	X = 0: Not available, otherwise X = 1	Request the current availability of DTS Dialog Control
!DTSDIALOGDN		DTS Dialog Control Down
!DTSDIALOGUP		DTS Dialog Control Up
!ENTER		Enter button
!EXIT		Exit button
!HDMIMAINOUT?	X is the number of the HDMI output. (See list)	Requests which HDMI output is used for main out.
!HDMIMAINOUT(X)	X is the number of the HDMI output. (See list)	Selects which HDMI output to use for main out.
!HDMIMATRIXMODE?		Requests the current state of the HDMI-matrix mode
!HDMIMATRIXMODEOFF		Sets HDMI-matrix-mode OFF
!HDMIMATRIXMODEON		Sets HDMI-matrix-mode ON
!HDMIOUT1(X)	X is the number of the HDMI-input to be used, see list.	Route HDMI input X video to HDMI output 1. If this command is used for the main HDMI output, source select will override this command.

!HDMIOUT2(X)	X is the number of the HDMI-input to be used, see list.	Route HDMI input X video to HDMI output 2. If this command is used for the main HDMI output, source select will override this command.
!HDMIOUT3(X)	X is the number of the HDMI-input to be used, see list.	Route HDMI input X video to HDMI output 3. If this command is used for the main HDMI output, source select will override this command.
!HDMIOUT4(X)	X is the number of the HDMI-input to be used, see list.	Route HDMI input X video to HDMI output 4. If this command is used for the main HDMI output, source select will override this command.
!HDMIOUT5(X)	X is the number of the HDMI-input to be used, see list.	Route HDMI input X video to HDMI output 5. If this command is used for the main HDMI output, source select will override this command.
!INFO		Info button
!INTERFACE?		Returns the active interface for this section -!INTERFACE(IP) or !INTERFACE(SERIAL)
!LIPSYNC-		Reduces the lipsync value.
!LIPSYNC?		Requests the lipsync value.
!LIPSYNC(X)	X is in the range returned by !LIPSYNCRANGE?	Sets the lipsync value.
!LIPSYNC+		Increases the lipsync value.
!LIPSYNCRANGE?		Returns the valid range for lipsync values.
!LOUDNESS?	0 (off) or 1 (on)	Requests loudness status
!LOUDNESS(X)	0 (off) or 1 (on)	Sets loudness status
!MAXVOL?	-550 to 240 (= -55.0 to +24.0 dB)	Requests the maximum volume setting
!MAXVOL(X)	-550 to 240 (= -55.0 to +24.0 dB)	Sets the maximum volume
!MENU		Menu Button
!MULTIVIEW		Multiview button
!MUTE		Mute toggle button
!MUTE?		Requests mute
!MUTEOFF		Mute off
!MUTEON		Mute on
!MVIEW(X)	0 to 5 (0 = multiview off, 1-5 = multiview layout)	Selects Multiview layout X (or turns off multiview, if X is 0)
!MVIEW?	0 to 5 (0 = multiview off, 1-5 = multiview layout)	Returns currently active multiview layout (or 0 if multiview is off)
!MVIEWACTIVE(X)	1 to 4 (Window number)	Sets active multiview window
!MVIEWACTIVE?	1 to 4 (Window number)	Returns active multiview window
!MVIEWSRC?	Indexes from the source-list	Reruns the 4 sources in the multiview windows.
!NEXT		Next button
!NUM(X)	0 to 9	Numeric buttons
!PING?		Ping
!PLAY		Play button
!POWER?	0 (standby) or 1 (on)	Requests power status
!POWEROFFMAIN		Power off
!POWEROFFZONE2		Zone B power off
!POWERONMAIN		Power on
!POWERONZONE2		Zone B power on
!POWERZONE2?	0 (off) or 1 (on)	Requests power status for Zone B
!PREV		Previous button
!RPFLOC-		Previous RoomPerfect position button

!RPFOC?	X is current RoomPerfect position (0=bypass, 1-4=focus1 – focus4, 9=global)	Request RoomPerfect position
!RPFOC(X)	X is RoomPerfect position to select (0=bypass, 1-4=focus1 – focus4, 9=global)	Set RoomPerfect position
!RPFOC+		Next Roomperfect position button
!RPFOCS?	N is the total number of available RP Positions. X is the number of the position and “name” is the name of the position as a string. Global and bypass will count as positions in this list.	Get available RoomPerfect positions
!RPVOI-		Previous voicing button
!RPVOI?	X is the currently selected voicing (taken from the list returned by RPVOIS?)	Request active voicing
!RPVOI(X)	X is the voicing to select (taken from the list returned by RPVOIS?)	Set voicing
!RPVOI+		Next voicing button
!RPVOIS?	N is the total number of available voicings. X is the number of the voicing and “name” is the name of the position as a string.	Request list of available voicings
!SETUP		Setup button
!SPKCONF?	X is a value from the list returned by !SPKCONFS?	Requests the index of the current speaker config
!SPKCONF(X)	X is a value from the list returned by !SPKCONFS?	Selects a speaker config
!SPKCONFS?	N is the total number of available speaker configs. X is the number of the config and “name” is the name of the config as a string.	Requests a list of Speaker configs
!SRC-		Previous source button
!SRC?	X is the number of the currently selected source and “Name” is the name of the source as a string.	Request active source
!SRC(X)	X is the source to select. For a list of sources use SRCS?	Select source
!SRC(X)?	X is the number of the requested source and “Name” is the name of the source as a string.	Get info for source x
!SRC+		Next source button
!SRCBTN		SRC button on the P200 remote
!SRCOFF-		Decrease Source volume offset
!SRCOFF?	X is the source volume offset for the currently selected source. Between -100 (= -10dB) and 100 (= +10dB)	Request source volume offset for current source
!SRCOFF(X)	X is the new source volume offset for the currently selected source. Between -100 (= -10dB) and 100 (= +10dB)	Set source volume offset for current source
!SRCOFF+		Increase source volume offset
!SRCS?	N is the number of available sources. X is the number of the source and “Name” is the name of the source as a string.	Request list of available sources
!STANDBYLEVEL?	X=0 for Deep sleep, X=1 for network standby	Requests current setting for standby level
!VERB?	0 to 2	Request verbosity level of active interface.
!VERB(X)	0 to 2	Set verbosity level of active interface.



!VIDIN?	X is the selected video input (See list)	Returns currently selected video input (See list)
!VIDTYPE?		Returns a string with the current video input
!VOL-		Decrease volume
!VOL-(X)	-999 to 240 (= -99.9 to +24.0 dB)	Decrease volume by x
!VOL?	-999 to 240 (= -99.9 to +24.0 dB)	Request current volume
!VOL(X)	-999 to 240 (= -99.9 to +24.0 dB)	Set volume to x
!VOL+		Increase volume
!VOL+(X)	-999 to 240 (= -99.9 to +24.0 dB)	Increase volume by x
!ZAUDIN?	X is the selected audio input for Zone B (See list)	Returns currently selected zone B audio input. (See list)
!ZMUTE		Toggle Zone B Mute
!ZMUTE?		Request Zone B Mute
!ZMUTEOFF		Zone B Mute off
!ZMUTEON		Zone B Mute on
!ZSRC-		Previous zone B source button
!ZSRC?	X is the number of the currently selected source and "Name" is the name of the source as a string.	Request current Zone B source
!ZSRC(X)	X is the source to select. For a list of sources use ZSRCS?	Set zone B source
!ZSRC(X)?	X is the number of the requested source and "Name" is the name of the source as a string.	Request info about zone B source x
!ZSRC+		Next zone B source button
!ZSRCS?	N is the number of available zone B sources. X is the number of the source and "Name" is the name of the source as a string.	Get list of available Zone B sources
!ZVOL-		Decrease zone B volume
!ZVOL-(X)	-999 to 240 (= -99.9 to +24.0 dB)	decrease zone B volume by X
!ZVOL?	-999 to 240 (= -99.9 to +24.0 dB)	Request current zone B volume
!ZVOL(X)	-999 to 240 (= -99.9 to +24.0 dB)	Set zone B volume
!ZVOL+		Increase zone B volume
!ZVOL+(X)	-999 to 240 (= -99.9 to +24.0 dB)	Increase zone B volume by x

## Control Protocol Usage

### Controlling Power

Main zone and zone 2 power can be controlled separately with commands !POWERONMAIN<CR>, !POWEROFFMAIN<CR>, !POWERONZONE2<CR> and !POWEROFFZONE2<CR>.

Command !POWER?<CR> is used to get the current power status of the main zone. The response for this command is !POWER(X)<CR>, where the X is 0 or 1, where 0 means the main zone is off and 1 means it is on.

Command !POWERZONE2?<CR> is used to get the current power status of the main zone. The response for this command is !POWERZONE2(X)<CR>, where the X is 0 or 1, where 0 means zone 2 is off and 1 means it is on.

### Controlling Volume

Commands !VOL+<CR> and !VOL-<CR> have the same effect as pressing volume up/down buttons from the IR remote control.

Commands !VOL+(X)<CR> and !VOL-(X)<CR> are used to increase or decrease volume by certain amount. The X in the commands can be anything between 1 and 999 (0.1dB – 99.9dB).

Command !VOL(X)<CR> is used to set the volume to some specific value. The X in the command can be -999 – 200 (-99.9dB – 20.0dB).

Commands !MUTEON<CR>, !MUTEOFF<CR> and !MUTE<CR> are used to set mute, clear mute and toggle mute respectively.

Command !VOL?<CR> is used to get the current value of the main zone volume. The response for this command is !VOL(X)<CR>, where X can be -999 – 200 (-99.9dB – 20.0dB). Please note that if verbosity level 1 or higher is used, volume information will be updated to the control interface automatically. There is always at least 100ms time period between the volume status messages. This period is used not to flood the control interface with too frequent volume updates every time volume is being adjusted.

Commands !ZVOL+<CR>, !ZVOL-<CR>, !ZVOL+(X)<CR>, !ZVOL-(X)<CR>, !ZVOL(X)<CR>, !ZVOL?<CR>, !ZMUTEON<CR>, !ZMUTEOFF<CR> and !ZMUTE<CR> are used to control zone 2 volume the same way as main zone volume.

Please note that the volume value in control protocol commands is always in 0.1dB accuracy, meaning that 1.0dB is a value of 10 in the control protocol. This is true for volume status messages and volume control commands.

Warning: Usage of maximum volume setting is highly recommended to prevent damage to equipment because of too loud volume setting! It is never possible to set the volume above the maximum volume level setting with control interface commands, but it is very easy to accidentally reach the maximum volume level.

## Controlling Sources

### Main zone:

A source is a combination of video input and audio input that can be selected freely from the user interface. The number and names of sources can vary depending on how many sources have been created when setting up the system. The installer can add, delete, edit and re-order the sources at any time.

Command `!SRCS?`<CR> is used to find out how many sources there are and what are their names. For example a response for `!SRCS`<CR> could be:

```
!SRCCOUNT(4)<CR>
```

```
!SRC(0)"DVD player"<CR>
```

```
!SRC(1)"Blu-ray player"<CR>
```

```
!SRC(2)"Game console"<CR>
```

```
!SRC(3)"PVR"<CR>
```

It can be seen from the response that there are 4 sources, named "DVD player", "Blu-ray player", "Game console" and "PVR".

Command `!SRC?`<CR> is used to find out which source is currently selected. The response for this command is `!SRC(X)"NAME"`<CR> where X is the index of the currently selected source (0 is the first index) and NAME is the name of the currently selected source.

Commands `!SRC+`<CR> and `!SRC-`<CR> are used to select next or previous source.

Command `!SRC(X)`<CR> is used to select a specific source. The X in the command can be anything between 0 and the index of the last source. This response is also send automatically, when the source changes, if feedback level is 1 or higher. If main zone is off, the P200 will reply with the previous selected source.

### **Zone 2:**

Sources on zone2 are a subset of the sources set up for main zone. Command !ZSRCS?<CR> is used to find out the indexes and names of the zone sources. For example a response for !ZSRCS?<CR> could be:

```
!ZSRCCOUNT(5)
!ZSRC(0)"Follow Main"<CR>
!ZSRC(1)"CD player"<CR>
!ZSRC(2)"SACD player"<CR>
!ZSRC(3)"MP3 player"<CR>
!ZSRC(4)"TV Sound"<CR>
```

It can be seen from the response that there are 5 zone 2 sources named "Follow Main", "CD player", "SACD player", "MP3 player" and "TV Sound". "Follow Main" is a special source, which is always present. It will send the sound from whichever source is selected in the main zone to zone 2.

Command !ZSRC?<CR> is used to find out which zone 2 source is currently selected. The response for this command is !ZSRC(X)"NAME"<CR> where X is the index of the currently selected source (0 is the first index) and NAME is the name of the currently selected source. This response is also send automatically, when the zone 2 source changes, if feedback level is 1 or higher. If zone 2 is turned off, the P200 will reply with the previous selected source.

Commands !ZSRC+<CR> and !ZSRC-<CR> are used to select next or previous source. Command !ZSRC(X)<CR> is used to select a specific source. The X in the command can be anything between 0 and the index of the last source.

## Controlling Processing Modes

The processor has controls for selecting processing modes, also called audio modes.

Command `!AUDMODEL?<CR>` can be used to get a list of processing modes; how many are there and what are their names. For example a response for command

`!AUDMODEL?<CR>` could be:

`!AUDMODECOUNT(8)`

`!AUDMODE(0)"None"<CR>`

`!AUDMODE(1)"dts Neo:X Cinema"<CR>`

`!AUDMODE(2)"dts Neo:X Music"<CR>`

`!AUDMODE(3)"dts Neo:X Game"<CR>`

`!AUDMODE(4)"Auro-3D/Auromatic"<CR>`

`!AUDMODE(5)"Dolby Upmixer"<CR>`

`!AUDMODE(6)"Stereo"<CR>`

`!AUDMODE(7)"Party"<CR>`

Commands `!AUDMODE+<CR>` and `!AUDMODE-<CR>` are used to select next and previous audio mode from the list of available audio modes.

Command `!AUDMODE(X)<CR>` is used to select a specific processing mode, where X is an audio mode index as seen in the reply above.

Command `!AUDMODE?<CR>` is used to find out which processing mode is currently selected. The response for this command is `!AUDMODE(X)"Name"<CR>`, where X is the index of the audio mode and Name is the name of the audio mode. This response is sent automatically, when the audio mode changes, if feedback level is 1 or higher.

## Controlling Focus Positions

Command !RPFOCS?<CR> is used to get the list of selectable focus positions along with their names. For example a response for !RPFOCS<CR> could be:

```
!RPFOCCOUNT(4) <CR>
!RPFOC(1)"Focus 1"<CR>
!RPFOC(2)"Focus 2"<CR>
!RPFOC(4)"Focus 4"<CR>
!RPFOC(9)"Global"<CR>
```

It can be seen from the response that there are 4 RoomPerfect positions, named "Focus 1", "Focus 2", "Focus 4" and "Global". Note that the numbering of the positions is not consecutive.

Command !RPFOC?<CR> is used to find out which position is currently selected. The response for this command is !RPFOC(X)"NAME"<CR> where X is the index of the currently selected position (a value between 0 and 9) and NAME is the name of the currently selected position. This response is sent automatically whenever the position is changed if feedback level is 1 or higher.

Commands !RPFOC+<CR> and !RPFOC-<CR> are used to select next or previous position. Command !RPFOC(X)<CR> is used to select a specific position. The X in the command can be any index from the list of measured focus positions retrieved by using command !RPFOCS?<CR>.

The installer might add or remove focus positions at any time so it is recommended to update the list of selectable focus positions at least in every boot-up.

## Controlling Voicings

Command !RPVOIS?<CR> is used to find out the list of selectable voicings along with their names. For example a response for !RPVOIS<CR> is:

```
!RPVOICOUNT(7)<CR>
!RPVOI(0)"Neutral"<CR>
!RPVOI(1)"Music"<CR>
!RPVOI(2)"Music II"<CR>
!RPVOI(3)"Relaxed"<CR>
!RPVOI(4)"Tilt"<CR>
!RPVOI(5)"Action"<CR>
!RPVOI(6)"Action+Movie"<CR>
```

It can be seen from the response that there are 7 voicings, named "Neutral", "Music", "Music II", "Relaxed", "Tilt", "Action" and "Action+Movie".

Command !RPVOI?<CR> is used to find out which voicing is currently selected. The response for this command is !RPVOI(X)"NAME"<CR> where X is the index of the currently selected voicing (0 is the first index) and NAME is the name of the currently selected voicing. This response is sent automatically whenever the current voicing is changed if feedback level is 1 or higher.

Commands !RPVOI+<CR> and !RPVOI-<CR> are used to select next or previous voicing. Command !RPVOI(X)<CR> is used to select a specific source. The X in the command can be any index from the list of voicings.

## Controlling Lipsync

Command !LIPSYNC?<CR> is used to find out the current value of the lipsync trim. The response for this command is !LIPSYNC(X)<CR> where X is the current lipsync trim in milliseconds.

Commands !LIPSYNC+<CR> and !LIPSYNC-<CR> are used to adjust the lipsync trim value by 5ms or -5ms respectively. Command !LIPSYNC(X)<CR> is used to set the lipsync trim directly. The valid value range for this command needs to be fetched from the P200 (see below).

Please note that the valid range to adjust the lipsync delay is retrieved with the !LIPSYNCRANGE? command, returning minimum and maximum value in ms.

### Getting main zone video and audio status

It is possible to find out currently selected source's video and audio input and current video and audio format in main zone.

Command !VIDIN?<CR> is used to find out the used video input of currently selected source. The response for this command is !VIDIN(X)<CR>, where X is the current video. See table of video inputs for the translation of the number to actual video input. This response is sent automatically whenever input selection changes if feedback level is 1 or higher.

Command !AUDIN?<CR> is used to find out the used audio input of currently selected source. The response for this command is !AUDIN(X)<CR>, where X is the current audio input. See table of audio inputs for the translation of the number to actual audio input. This response is sent automatically whenever input selection changes if feedback level is 1 or higher.

Command !VIDTYPE?<CR> is used to find out the current video input format. The response for this command is !VIDTYPE(Typestring)<CR>, where Typestring is a string describing the current video format. This response is sent automatically whenever input signal changes if feedback level is 1 or higher.

Command !AUDTYPE?<CR> is used to get information about the current audio signal type. The response for that command is !AUDTYPE(Typestring)<CR>, where Typestring is a string describing the current input audio type. This response is sent automatically whenever input signal changes if feedback level is 1 or higher.



## Getting Zone 2 Audio Status

It is possible to request the currently selected zone source's audio input in zone 2.

Command !ZAUDIN?<CR> is used to find out the used audio input of currently selected zone source. The response for this command is !ZAUDIN(X)<CR>, where X is the current zone 2 audio input. See table of audio inputs for the translation of the number to actual audio input. This response is sent automatically whenever input selection changes if feedback level is 1 or higher.

## Controlling Feedback Level

It is possible to set the feedback level from the external control interface with command !VERB(X)<CR>, where X is the wanted feedback level 0, 1 or 2.

## Controlling OSD and OSD Menu

There are two On Screen Display menus in the P200 and P300: The Installer menu is intended to be used by the installer and that menu should not be offered to the end user. The user menu (titled "Menu") is intended for the daily use of the user, with easy access to trims and post processing options. The P100 and Head Unit features the installer menu only.

When using a well-designed control interface, it should not be necessary for the user to access the OSD menu. It is, however, possible to access and use both of these menus by using the control interface.

Command !MENU<CR> is used to enter the "user menu.

Command !ENTER<CR> does the same as the "Ok" button in the installer IR remote.

Commands !DIRU<CR>, !DIRD<CR>, !DIRL<CR>, !DIRR<CR> and !BACK<CR> have the same effect as the similar buttons in the installer IR remote.

Please note that there is no way for the control interface to know whether the system is in OSD menu or not. In normal operation there should be no need for the user to access the On Screen Menu when using a dedicated control interface.

### Direct controlling of HDMI outputs

It is possible to control the HDMI outputs of the processor controller directly using special control interface commands. The controlling allows routing of any HDMI input directly to either one of the HDMI outputs in bypass mode. Bypass mode means that there is no On

Screen Display possibility. These commands are not available for the HDMI output currently used as the main output. For selecting what is shown on the main output, please use the source-commands.

The commands !HDMIOUT1(X), !HDMIOUT2(X), !HDMIOUT3(X), !HDMIOUT4(X), !HDMIOUT5(X) are used for selecting which input is shown on each output, where X is the number of the input, see the list of video inputs for the values.

Control of main HDMI output (Applicable for P200 only!)

The main HDMI output is controlled by using the source-commands. But there are two additional functions to use for the main output.

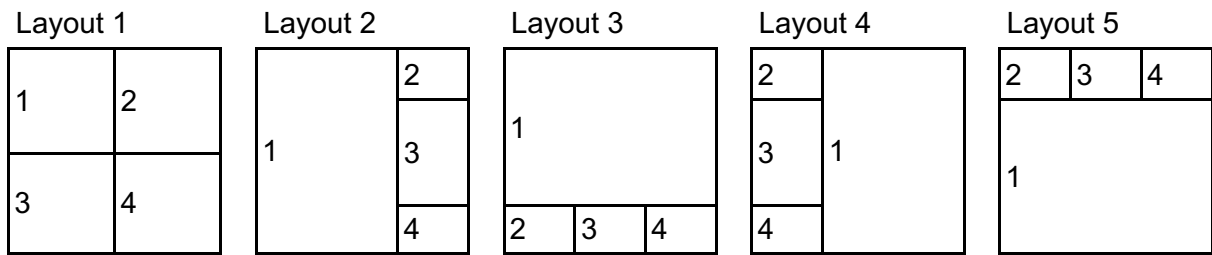
The command !HDMIMAINOUT(X) can be used to select which HDMI output is used for the main output. For possible values see the table of video outputs. Note that one of the available outputs is the "Video Wall" option, so this command can be used to enable or disable the video wall. To request the current value, use the command !HDMIMAINOUT(X). This can be used to fetch the old value before switching to video wall mode, so it can be stored for restoring the old setting.

**Controlling Multiview (only applicable for P200/ P300)**

The command !MULTIVIEW will do the same as the “PiP” button on the remote. Once multiview has been enabled it can be controlled with the commands for direction-buttons etc.

Multiview can also be controlled more directly. The !MVIEW(X) command will directly select the layout of multiview. If a non-zero X-value is send while multiview is off, multiview will be turned on with layout X active. Sending X=0 will turn off multiview.

The command !MVIEWACTIVE(X) will set window X as the active multiview window. Once a window is active, normal source-selection etc. will affect this window.



**AUDIO INPUTS**

No.	Audio Input
0	None
1	HDMI
2	8 Channel Analog
3	Spdif 1 (Optical)
4	Spdif 2 (Optical)
5	Spdif 3 (Optical)
6	Spdif 4 (Optical)
7	Spdif 5 (AES)
8	Spdif 6 (Coax)
9	Spdif 7 (Coax)
10	Spdif 8 (Coax)
11	Internal Player
12	USB
13	Analog 1 (Unbalanced)
14	Analog 2 (Unbalanced)
15	Analog 3 (Unbalanced)
16	Analog 4 (Unbalanced)
17	Analog 5 (Balanced)
18	(Reserved, do not use)
19	(Reserved, do not use)
20	16-Channel Input (optional for P200/P300)
21	Audio Return Channel

## VIDEO INPUTS

No.	Video Input
0	None
1	HDMI 1
2	HDMI 2
3	HDMI 3
4	HDMI 4
5	HDMI 5 (applicable for P200/P300 only)
6	HDMI 6 (applicable for P200/P300 only)
7	HDMI 7 (applicable for P200/P300 only)
8	HDMI 8 (applicable for P200/P300 only)
9	Internal (applicable for P200/P300 only)

## VIDEO OUTPUTS (applicable for P200/P300 only)

No.	Video Output
0	None
1	HDMI Out 1
2	HDMI Out 2
3	HDMI Out 3
4	HDMI Out 4
5	HDBT Out
6	(Reserved, do not use)
7	Video Wall

## IR CODES

### NEC Protocol

Description	Value
0	0x37CA, 0x00FF
1	0x37CA, 0x01FE
2	0x37CA, 0x02FD
3	0x37CA, 0x03FC
4	0x37CA, 0x04FB
5	0x37CA, 0x05FA
6	0x37CA, 0x06F9
7	0x37CA, 0x07F8
8	0x37CA, 0x08F7
9	0x37CA, 0x09F6
Audio	0x37CA, 0x0AF5
Setup	0x37CA, 0x0BF4
Power Toggle	0x37CA, 0x0CF3
Power On	0x37CA 0x807F
Power Off	0x37CA 0x817E
PiP	0x37CA, 0x0DF2
Previous	0x37CA, 0x0EF1
Play_Pause	0x37CA, 0x0FF0
Next	0x37CA, 0x10EF
Up	0x37CA, 0x11EE
Left	0x37CA, 0x12ED
OK	0x37CA, 0x13EC
Right	0x37CA, 0x14EB
Down	0x37CA, 0x15EA
Back	0x37CA, 0x16E9
Menu	0x37CA, 0x17E8
SRC	0x37CA, 0x18E7
Vol+	0x37CA, 0x19E6
SRC+	0x37CA, 0x1AE5
Vol-	0x37CA, 0x1BE4
Mute	0x37CA, 0x1CE3
SRC-	0x37CA, 0x1DE2
Source 0	0x37CA, 0x718E
Source 1	0x37CA, 0x728D
Source 2	0x37CA, 0x738C
Source 3	0x37CA, 0x748B
Source 4	0x37CA, 0x758A
Source 5	0x37CA, 0x7689
Source 6	0x37CA, 0x7788
Source 7	0x37CA, 0x7887
Source 8	0x37CA, 0x7986

RS232 pinout diagram

