

# spatz

Operation Manual

# PROSWITCH-8



01/12

2012 SPATZ

May change with ongoing feature upgrades and firmware improvements

[www.spatz-tech.de](http://www.spatz-tech.de)

## 1. Introduction

Many thanks for buying for buying the SPATZ **PROSWITCH-8** HDMI/DVI/VGA switcher. We have tried to manufacture an innovative and easy to operate device without compromising the unique features that only can be found in our product.

We hope that the **PROSWITCH-8** exceeds your expectations and does the job right.

The manual is divided in 2 sections operation and installation and we strongly recommend to read the manual before using or installing the unit.

Once in a while new source devices or new features are implemented due to customer demand and we will offer firmware updates on our website [www.spatz-tech.de](http://www.spatz-tech.de) or [www.spatz.tech.com](http://www.spatz.tech.com).

## 2. Features

The SPATZ **PROSWITCH-8** HDMI/DVI/VGA switcher offers a number of unique features that make it the perfect tool for a professional switcher. You may use the unit in the most demanding professional environment or at home to switch your sources and run your home theater.

Pls find an overview of what makes the **PROSWITCH-8** so special.

- **SPATZ SingleEDID Technology for DVI and VGA individual programmable**
- **GREEN Technology with STANDBY Power lesser than 1 Watt**
- **8 DVI-I/HDMI 1.3 Inputs**
- **Full HDCP support – requires hdcp-compatible Monitor**
- **Integrated VGA switcher with 350 MHZ bandwidth**
- **IPAD2 compatible**
- **3D compatible with integrated EDID or Learned**
- **8 RCA Stereo Audio Inputs**
- **4 coax SPDIF digital audio Inputs**
- **60m/200ft cable equalizer for each DVI/HDMI input**
- **Output stage Drives 20m cable at full 1080p or UXGA**
- **1 DVI-I output with reclocking**
- **Volume control for analog Stereo Audio Output**
- **Automatic input detection for VGA and DVI**
- **Automatic switching to active input**
- **Signalizing of VGA or DVI input detection**
- **Fast Switching because of SingleEDID technology**
- **Supports HDMI 1.3 with Deep color and HD Audio**
- **Infrarot Remote control**
- **Complete control through front panel with LC-display**
- **RS-232 Control (AMX, Crestron)**
- **Input Switching using 8 contact closures**
- **19 inch Rack mount**

### TIP !

**Very helpful software to read out EDID of displays**

<http://www.entechtaiwan.com/util/moninfo.shtml>

### 3. Function

The main task for a digital video switcher is the instant switching without long waiting times or image distortion. SPATZ SingleEDID technology guarantees the shortest switching times matching those of analog switches. The PROSWITCH-8 offers all kind of EDID management including learning the displays EDID which we do not recommend because SingleEDID would not be active then.

The whole idea of using EDID management is to move the EDID information in front of the switcher so the source does not know about the switch and will not renegotiate EDID information which is usually the cause for long switching times.

We have been using HDMI 1.3 compatible IC's so the PROSWITCH-8 is fully compatible with HDMI signals incl. deep color modes and HD audio. You may need HDMI to DVI adaptors that are available from us.

In addition each video input has an accompanying stereo audio input that may be switched with the video or independently if that is required by your installation. The audio inputs all have volume control.

Some systems may require 5.1 Surround signals that are switched independently of the HDMI with embedded audio, so we are offering 4 digitale coax inputs with a corresponding output that are routed to inputs 1-4.

The DVI-I connectors can accept DVI and VGA signals using our DVIBREAK-OUT cable providing EDID information for both signals with an automatic detection which of the signals has been connected. The PROSWITCH-8 will signalize this at the Phoenix connector at the back toggling between 0 and 5V. You may use this information with AMX or CRESTRON to automatically switch your display between VGA and DVI input. The DVI inputs have powerful cable equalizers that allow cable runs of 60m from source or pockets to PROSWITCH-8.

Both VGA and DVI signals may be programmed into auto switching so if you connect your source at any of the 8 inputs the PROSWITCH-8 will instantly switch to it.

### 4. Operation

#### Remote Control

The input LED's will show you the active input with the ability to control the intensity of the LED's in the setup menu of the unit. The integrated infrared receiver may be turned off in the menu to prevent accidental operation of the unit. The remote is shipping with the unit and should have been in the box.

The remote is working in typical distances and in a wide angle from the units location.

At the back of the unit there is 10-pin Phoenix style connector that allows remote selection of the inputs using a simple contact closure.

#### Commands



#### Power

Turn the unit on with the ON and into Standby using OFF. According to latest green standards the standby power is less than 1 Watt.

#### Input Selection

Use the number buttons to select any of the 8 inputs, OK is storing your changes

#### EXIT

Ends current settings

#### Pfeiltasten

The arrow buttons have the same functionality as the units buttons so please read below to understand how to use them

## 4.1 General operation

The setup of **PROSWITCH-8** may be performed using only the 4 front buttons and the guided LC-display. There are 3 main groups of settings that are accessible with the right button. The UP and DOWN buttons cycles through EDID, MANAG. GROUP, DEVICE GROUP or SWITCH GROUP. If you want to make adjustments in one of these groups use the right button to change setting for the active input. UP and DOWN cycles through the available settings in that sub group. Pressing the right button again allows you to make adjustments indicated by a blinking cursor. UP and DOWN buttons will change the parameters. To leave the adjustment use the left button, the cursor should stop blinking and store the settings permanently with the STORE button.

If you keep the input button pressed for min 3s the unit will generate a HotPlug signal at this input starting the renegotiating process with the source.

The following paragraphs will explain the menu structure in detail.

### 4.1.2 DEVICE GROUP

<b>Volume</b>	adjustable in steps from 0-16
<b>Audio Mute</b>	on/off
<b>Auto Select Mode</b>	Off/1-8/8-1      Priority setting if more than one input is active
<b>Auto Sel DVI by</b>	Connection/Signal Changes behavior of automatic switching use hotplug or video
<b>LED Brightness</b>	0-10
<b>LCD Backlight</b>	0-10
<b>LCD Contrast</b>	0-10
<b>IR Remote</b>	on/off
<b>IR Indication</b>	on/off      Will blink POWER LED if IR signal is received
<b>SoftwareDownload</b>	hold DOWN button 3 sec to enter the firmware update mode (see 4.3)
<b>Reset to Default</b>	(see 4.2)

### 4.1.3 SWITCH GROUP

<b>Audio Mode</b>	Breakaway/Follow Video
<b>Selection</b>	Audio/Video

„Selection“ is only displayed if Breakaway has been activated. If the LC-display is showing "VIDEO" e.g. V5A5 then video and audio are switched together, if the display is showing AUDIO e.g. V5A1 then using the input buttons will only switch audio the video will not be changed. This new assignement will be resetted when "Follow Video" is reactivated.

Note:

The individual assignment of audio to video is allowing to route audio 1 to all video inputs so no matter what video input is selected audio 1 will stay the active audio input but offering volume control.

### 4.1.3 EDID MANAG. GROUP

The most powerful tool of the **PROSWITCH-8** is the completely manageable EDID system including the SPATZ SingleEDID technology.

<b>EDID Mode</b>	<b>Learned/SingleEdid/Default EDID/Thru</b>
<b>LEARNED</b>	<p>A display must be connected before using this feature ! This is the mode you may find in many other products. It will allow you to read the EDID table of the display connected at the output and store it in the units memory. The PROSWITCH-8 will present this EDID to the source simulating the display at each of its 8 input (in common mode). After a complete reset this memory contains the EDID of a 1920x1200 computer monitor that offers most of the resolutions that are used today.</p>
<b>3D ALL AUDIO/ 3D 2CH Audio</b>	<p>These are the 2 3D EDID modes of the unit that will force a BluRay Player to output a 3D image with either all audio options turned on or only 2Ch in case you have selected the "3D 2CH Audio" EDID.</p>
<b>EDID LEARN</b>	<p>A monitor must be connected ! The right button activates the EDID learning, a blinking cursor indicates proper operation, now press the DOWN button for 3 sec to activate the transfer.</p>
<b>Thru</b>	<p>This is the standard mode of a simple switcher that is generating a HotPlug Signal with each input selection. We do not recommend this setting as it generates the longest switching times. It may be necessary for testing purposes hence the reason we are offering it.</p>
<b>Hotplug Break</b>	<b>At Thru Mode/Always</b> <p>This setting determines if the PROSWITCH-8 is generating a HotPlug signal only in through mode or even using the other EDID modes. Some sources have a funny programming especially modern HDMI sources and they will go into a sleep mode if they have no active connection for a certain period of time. The HotPlug signal is sometimes the only way to awake them. This may be used in the "Individual Mode" so other inputs will not send HotPlug signal with the switching thus maintaining fast switching times. The setting <b>ALWAYS</b> generates a HotPlug no matter what EDID mode is active.</p>
<b>EDID Handling</b>	<b>Common/Individual</b> <p>This setting determines if the EDID programming is for the active input only or applied to all inputs. The Common mode speeds up the Setup of the unit, as you do not have to setup all 8 inputs with their desired EDID modes. Some modes may require individual programming, especially if you mix DVI and HDMI sources.</p>
<b>#Driver Strength</b>	0-7                      Changes the output power of the DVI output stage
<b>#Driver Termin.</b>	-30-0                    Changes the high frequency behaviour of the output  Usually these settings do not show any results if the output shows no distortions. With very long cable runs beyond 20m or bad cables they may help to improve the signal quality.
<b>EDID MODE SingleEdid</b>	<p>This is the main supgroup that allows EDID settings. This is the SingleEDID adjustment, pls refer to paragraph 7.</p>

## 4.2 Remote Control and signaling

The PROSWITCH-8 has a 10 pin Phoenix like connector at the back. A simple momentary contact closure will select the corresponding input. PIN 10 is common for contacts 1-8.

Pin 9 signalizes with 4V that a DVI/HDMI source has been connected, in case of a VGA source the PIN carries 0V signal level.

A typical control system can detect this change and will allow you to control your display to toggle with the PROSWITCH-8 between DVI and VGA input.

Another option would be to use the SPATZ DIGISCALE and convert VGA and DVI input signals to DVI or VGA and scale them to the native resolution to the connected display.

## 4.3 RESET

The **PROSWITCH-8** is a complicated technical device that may not work as it should because certain button combinations or serial commands have compromised its internal computer.

In these cases we recommend to repower the unit and remove and replug the mains. If this is not helping to solve the issue it may be necessary to RESET the unit.

Use the navigation buttons until you reach „Reset to Default „ and then press the right button, when the Cursor is blinking press the DOWN button for min. 3 secs.

The unit is restarting and shows the current firmware on the LC-display.

After a full RESET all EDID memories hold the Default EDID setting which is a SingleEDID that holds the 1280x720p setting that is widely compatible with most modern displays.

## 4.4 Firmware Update

It is very simple to update the firmware of the **PROSWITCH-8**. Just download the firmwareupdate \*.txt File from [www.spatz-tech.de](http://www.spatz-tech.de) or [www.spatz-tech.com](http://www.spatz-tech.com).

The firmware is a simple text file that you can write into the unit using the Hyperterminal communication software that is part of any Windows operating system.

We also provide a configuration file for Hyperterminal so your serial port settings are matching those of the PROSWITCH-8 (57600,8N1).

Once you have launched the program and are connected to the unit, you may verify proper communication by either sending serial commands by typing them in the hyperterminal or replug power which forces the unit to send some status messages.

Once you have verified you have a serial communication established you have enter the DEVICE GROUP and navigate to „SoftwareDownload“. Right button engages verifying with blinking cursor, now hold the DOWN button for min. 3 sec.

The unit will now run in the update mode, you should have seen status messages in the hyperterminal windows and the display brightness has been reduced.

Now you can upload the new firmware by executing „send text file“ and selection the \*.txt file that you have downloaded from our website.

In no circumstance should you remove the powercord while updating the unit as the unit will delete the firmware memory at some point. If that ever happens you will only be able to perform the update again but the unit might not work properly anymore. Just repeat the above steps !

## 5. Installation

### Installation

After removing the unit from the packaging we recommend to keep the original packing in case you need it for servicing.

### What is in the box:

#### PROSWITCH-8

Infrared remote incl. 2 AAA batteries

Mains cable Phoenix type 10-pin plug

This manual

### Front

The LC-display will show all the relevant operating messages while setting the unit up or performing adjustments. Each of the 8 inputs has an active LED, the Power LED also serves as IR indicator if selected in the Setup.

To turn the unit off, you will have to keep the POWER pressed for min. 3 sec so you cannot accidentally turn it off.

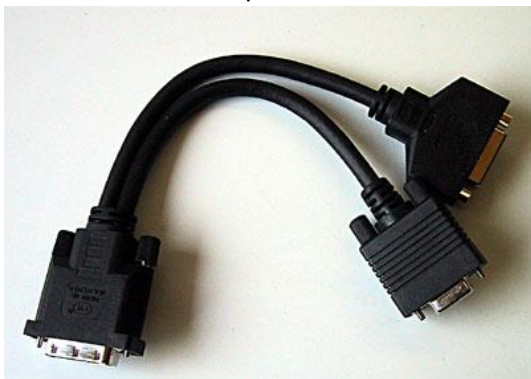
### BACK

Alle connections of the **PROSWITCH-8** are located at the back

- POWER: 100-250V AC
- DVI-I or HDMI 1.3 compatible connectors up to 225 MHz (matches HDMI 1.3 specs)
- RS-232 for remote control or firmware update 57600 Baud 8N1
- STEREO AUDIO INPUTS 1-8, Stereo RCA
- SPDIF inputs 1-4 routed to Video 1-4
- DVI-I OUT, connects to the display or projector
- STEREO AUDIO OUT, RCA
- SPDIF OUT for Dolby Digital or PCM 2-channel
- REMOTE for remote selection of 1-8 and toggle output between VGA and DVI

### 5.1 Optional BreakOut cable

For ease of use we supply a special cable to get access to the DVI and VGA in and outputs of the **PROSWITCH-8**. It split the DVI-I connector into a separate VGA and DVI female connector



## 6. Inputs/Outputs

The **PROSWITCH-8** offers a total of 8 DVI-I inputs that are fully compatible with HDMI 1.3. To access VGA and DVI independently you will have to use our DVI Breakout cable with female sockets. Both VGA and DVI are using a common fully programmable EDID including our unique SingleEDID technology. VGA inputs have a usable bandwidth of 350MHz, the HDMI/DVI inputs will work with 480i-1080p or VGA to WUXGA incl. Deep Color formats and HD audio.

### 6.1 Audio inputs

The audio inputs of the **PROSWITCH-8** have individual volume control to balance levels of individual sources incl. Master volume control. The setup allows to select between audio follows video or breakaway. The volume control works from -53.5 to +3,3 dB divided in 16 selectable steps. Volume settings are available through the remote (UP/DOWN) button, front panel (UP/DOWN button) or RS-232 with automatic storage of the new value. The maximum allowed input level is -2,5dBFS that equals 4,5 Vss, the maximum output level is 5,4 Vss/-0,9dBFS.

### 6.2 Digital audio inputs

In addition to the stereo audio inputs the **PROSWITCH-8** offers 4 digital audio inputs that are compatible with SPDIF signals in 2 ch or 5.1 ch formats. The routing is fixed to inputs 1-4.

### 6.3 HDMI usage

If you intend to use the **PROSWITCH-8** with HDMI signals we recommend to carefully read the following chapter explaining EDID management and SingleEDID technology.

We have used HDMI 1.3 chips inside the units so the DVI connectors are only chosen because of better mechanical stability. CEC is not supported.

To connect HDMI signals to the unit you may want to use one of our HDMI to DVI adaptors or just buy a cable that has a DVI at one end and a HDMI connector at the other end.

## 7. EDID Programming

### For experts:

The EDID information of any digital or even analog display serves the purpose to tell the source the video resolutions that you can use with this particular display.

Usually the EDID information is holding more than one resolution so depending on the source firmware it may use any of the various available with the risk that this is not the one you actually want.

In installations where you have displays of different resolutions or displays that have wrong EDID information it is mandatory to offer a tool that we call SingleEDID.

Usually when switching inputs, EDID information is renegotiated between source and display resulting in longer switching times. Presenting the EDID before the actual switching hardware will eliminate this renegotiation. With SPATZ SingleEDID technology we have taken this a step further enforcing the source to adjust to that the resolution we want it to be. Giving the source only one choice of video resolution simplifies the system setup and improves the switching reliability. Many sources now offer "AUTO" modes where they look for the resolution that is marked native in the EDID information and adjust their output accordingly. This may result in undesired resolution settings, as we have found 1080p displays that have 720p marked as "native". With SingleEDID you always have the desired resolution being the "native" as it is the only one we offer.

## 7.1 EDID PROGRAMMING –For experts only

The SingleEDID (Assembled) programming of **PROSWITCH-8** must be done using the front buttons and the LC-Display. Please read the instructions carefully as resolution setting that are not supported by the display may result in getting no picture.

If you are running in this problem you will have to change the setting and reboot your PC or HDMI source so it can renegotiate the EDID. If you put the unit in pass through then EDID management is not active and the displays EDID will be passed through the unit to the source. We do not recommend this other than testing purposes. If you want to use the display's EDID use the LEARNING function and store it into the unit.

Not all of the settings may have effect on the source behaviour !!!

Typically audio settings can be forced by the user in the source setup.

## 7.3 Preprogrammed resolutions to be used for SingleEDID (Assembled)

640x480/60	1364x768/75	1280x720p/50
640x480/75	1280x1024/50	1280x720p/60
848x480/60	1280x1024/60	1920x1080i/50
800x600/50	1280x1024/75	1920x1080i/50
800x600/60	1366x1024/60	1920x1080i/60
800x600/75	1400x1050/50	1920x1080p/24
1024x768/50	1400x1050/60	1920x1080p/25
1024x768/60	1400x1050/75	1920x1080p/30
1024x768/75	1680x1050/60	1920x1080p/50
1152x864/75	1600x1200/50	1920x1080p/50
1280x768/50	1600x1200/60	1920x1080p/60
1280x768/60	1920x1200/50	2048x1080p/50
1280x768/75	1920x1200/60	2048x1080p/50
1280/800/60	480i/59,94	2048x1080p/60
1280/800r/60 reduc. blanking	640x480p/59,9	640x480/60
1360x768/60	720x480p/59,9	
1364x768/50	576i/50	
1364x768/60	720x576p/50	

## 7.4 Preprogrammed selection for color space settings

RGB

YPrPB /Component 4 : 2 : 2

YPrPb/Component 4 : 4 : 4

## 7.5 Preprogrammed selection of audio standards

01) LPCM 2.0 48kHz 24bit	speaker=FL/FR
02) DolbyDigital (AC-3) 5.1 48kHz 640kbps max.	speaker=FL/FR,LFE,FC,RL/RR
03) MPEG-1 2.0 48kHz 192kbps max	speaker=FL/FR
04) MP3 2.0 48kHz 192kbps max.	speaker=FL/FR
05) MPEG-2 (multichannel) 5.1 48kHz 528kbps max.	speaker=FL/FR,LFE,FC,RL/RR
06) AAC5.1 48kHz 512kbps max.	speaker=FL/FR,LFE,FC,RL/RR
07) DTS 5.1 48kHz 1536kbps max.	speaker=FL/FR,LFE,FC,RL/RR
08) ATRAC 2.0 48kHz 292kbps max.	speaker=FL/FR
09) <AStd 09> 5.1 44.1kHz (unspecified)kbps max.	speaker=FL/FR,LFE,FC,RL/RR
10) <AStd 10> 7.1 48kHz (max.)kbps max.	speaker=FL/FR,LFE,FC,RL/RR,RLC/RRC
11) <AStd 11> 7.1 96kHz (min.)kbps max.	speaker=FL/FR,LFE,FC,RL/RR,RLC/RRC
12) <AStd 12> 7.1 96kHz (unspecified)kbps max.	speaker=FL/FR,LFE,FC,RL/RR,RLC/RRC
13) <AStd 13> (reserved) 5.1 96kHz (max.)kbps max	speaker=FL/FR,LFE,FC,RL/RR,RLC/RRC
14) <AStd 14> (reserved) 5.1 96kHz (max.)kbps max.	speaker=FL/FR,LFE,FC,RL/RR,RLC/RRC
15) <AStd 15> (reserved) 5.1 96kHz (max.)kbps max.	speaker=FL/FR,LFE,FC,RL/RR,RLC/RRC

## 7.6 Preprogramed selection of audio channels

Select the number of channels:

2.0, 5.1, 6.1, 7.1, 3CH, 4 CH, 5CH,6 CH, 7CH, 8CH

## 7.7 Preprogrammed selection of AUDIO Sampling Frequencies

F1) 32kHz

F2) 44.1kHz

F3) 48kHz

F4) 88.2kHz

F5) 96kHz

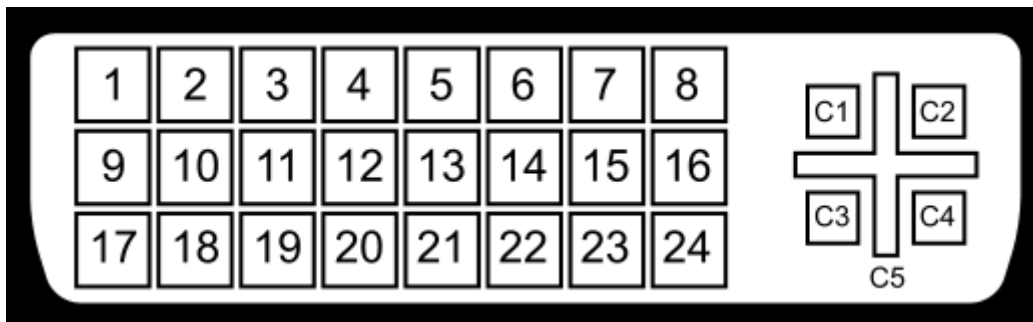
F6) 176kHz

F7) 192kHz

## 7.8 Preprogrammed selection of audio bitrates

This setting is only available when PCM modes are selected previously 16,20 or 24 BIT

## 8. Pin Out



**29 pin DVI Connector PinOut and Signal Names**

Pin #	Signal Name	Pin #	Signal Name	Pin #	Signal Name
1	TMDS Data2-	9	TMDS Data1-	17	TMDS Data0-
2	TMDS Data2+	10	TMDS Data1+	18	TMDSData0+
3	TMDS Data2/4 Shield	11	TMDS Data1/3 Shield	19	TMDS Data0/5 Shield
4	TMDS Data4-	12	TMDS Data3-	20	TMDS Data5-
5	TMDS Data4+	13	TMDS Data3+	21	TMDS Data5+
6	DDC Clock [SCL]	14	+5 V Power	22	TMDS Clock Shield
7	DDC Data [SDA]	15	Ground (for +5 V)	23	TMDS Clock +
8	Analog vertical sync	16	Hot Plug Detect	24	TMDS Clock -
<b>C1</b>	Analog Red	--	--	--	--
<b>C2</b>	Analog Green	--	--	--	--
<b>C3</b>	Analog Blue	--	--	--	--
<b>C4</b>	Analog Horizontal Sync	--	--	--	--
<b>C5</b>	Analog GND Return: (analog R, G, B)	--	--	--	--

## 9. Technical data

<b>Dimensions</b>	483 mm x 44 mm x 185 mm, 19inch rackmount
<b>Weight</b>	approx 2 kg/4lbs
<b>Housing color</b>	black
<b>Power supply</b>	Internal IEC connector 100-250V
<b>Video Inputs</b>	DVI-I connectors , HDMI 1.3/DVI and VGA VGA Bandwidth 350 MHz HDMI/DVI bandwidth 225 MHz, 480i - 1080p, 640 x 480 - 1920 x 1200
<b>Integrated cable EQ</b>	Equalizes up to 60m cable at 1920x1200 or 108p The cable compensation is fully automatic and needs no user adjustments
<b>Video Output</b>	DVI-I connector, HDMI 1.3/DVI and VGA
<b>Audio Inputs</b>	Analog Stereo max input level -2,5dBFS equals 4,5 Vss adjustable range -53.5 /+3,3 dB
<b>Audio Output</b>	maximum output level is 5,4 Vss/-0,9dBFS
<b>Digitale Audio IN/OUT</b>	SPDIF or 2-channel PCM
<b>Remote control</b>	Infrared or RS-232, Baudrate 57600, 8N1
<b>CONTROL PORT 10 pin</b>	Contacts 1-8 are contact closures sharing pin 10 as common Pin 9 toggles between 0 and 4V for DVI and VGA signaling having pin 10 as ground.

## 10. RS-232 Protocol

### Pinout of RS-232 cables

You can use any RS-232 regular cable, the pin out is straight 2,3 and 5 for plug and socket.

You may fully control the **PROSWITCH-8** using the serial command interface.

The RS-232 port will accept a PC or AMX/CRESTRON like control system.

The communication settings are fixed 57600 BAUD, 8 databits, no parity and 1 Stop Bit.

No Hardware or Software handshaking.

### 11.1 RS-232 commands

IN	<RET> & (Nb 1-8) <RET>	Video+Audio Input
VIN	<RET> & (Nb 1-8) <RET>	Video Input
AIN	<RET> & (Nb 1-8) <RET>	Audio Input
VOL	<RET> & (Nb 1-16) <RET>	Volume
MUT	<RET> & (Nb 0/1) <RET>	Mute
HPB		Hot Plug Break
EON		Echo On
EOF		Echo Off
STA		Status Request
SWD		Software Download
A18		Activates Automatic Order 1->8
A81		Activates Automatic Order 8->1
AOF		Deactivates Automatic

Status Returns: >Input1,no signal,Audio1  
>Input2,DVI,Audio2  
>Input1,VGA,Audio3

Example:

Switching to input 4 IN[CR]4[CR]  
VOLUME 14 VOL[CR]14[CR]