



# avalon<sup>o</sup>

HD Component Video / Digital Audio Matrix Switch



## User's Guide



## **Quick Reference Guide**

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From the front panel or IR remote, press:

**IN, INPUT#, OUT, OUTPUT #**

To switch audio only, press:

**AUDIO, INPUT#, OUT, OUTPUT #** (audio1 on the remote)

To switch video only, press:

**VIDEO, INPUT#, OUT, OUTPUT #** (video1 on the remote)

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# Introduction

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Congratulations on your purchase of Neothings' Avalon matrix switch. Avalon is a family of matrix switches featuring component video and digital audio. The Avalon is available in a 6x2 and a 8x4 configuration.

## ***Features***

- Up to 8 inputs of component video (YPbPr) and digital audio
- Up to 4 outputs of component video and digital audio
- High bandwidth video section (100MHz) for 480i up to 1080p.
- Multi-channel digital audio ready. Fully supports Dolby Digital 5.1, 6.1, 7.1, EX, DTS, PCM, and LPCM modes.
- Each digital audio input will accept either Toslink optical or SPDIF coax type digital audio.
- Digital audio outputs feature both coax and optical with full cross conversion.
- Attractive enclosure featuring brushed aluminum and high gloss acrylic front, with silver top cover.
- Universal AC input power, 90-240VAC 50/60Hz with standard IEC320 receptacle.
- All gold plated RCA connectors ensure a long life without corroded connectors.

# Installation

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The Avalon Matrix Switch does not require ventilation, so it can have other equipment such as amplifiers stacked on top of it. The Avalon is also equipped with padded feet so it may be stacked on top of other equipment without causing damage. In either case, to avoid scratches, never slide equipment on top of one another.

## ***Unpacking***

The shipping carton for your Avalon matrix switch will include the following items:

- 1 – Avalon Matrix Switch (6x2 or 8x4)
- 1 – AC Power cord
- 1 – 6' USB cable
- 1 – User's Guide
- 1 – CD-ROM driver disc

If accessories were ordered, the carton may also contain:

- 1 – IR remote control
- 1 – Pair of rack mount ears with screws

## ***Front Panel Protective Film***

There is a clear film over the front panel to protect it during manufacturing and shipping. Remove this film before using your Avalon matrix switch.

## ***Inputs***

Connecting your source devices to the Avalon can be done in any order. All inputs have the same performance, so organize them as

you see fit. Just be sure to connect the video “Y” signal to the green connector, “Pb” to the blue, and “Pr” to the red connectors.

When connecting digital audio, you may use either the orange RCA for SPDIF coax, or the black Toslink optical connectors. The Avalon will auto-select whichever signal is active.

## ***Outputs***

Having a true matrix switch allows you to treat each output as a ‘zone’. For example, Output 1 can be the home theater zone, and output 2 can be the master bedroom zone. In this case you would run a set of component video cables plus a digital audio cable to each zone. The maximum length of cable to each zone will vary on the quality of the cable used, but if high quality cable is used, the Avalon can support zones 300 feet away.

Connect the digital audio outputs to your surround processor or AV receiver. You only need to connect either the optical or coax to the receiver, not both.

## ***USB***

If you plan to use the USB communication feature of the Avalon, connect the USB cable to your PC’s USB port (flat end), and the other end (square end) to the Avalon matrix switch.

Optionally you may choose to connect this cable later when you are prepared to install the driver CD-ROM. Connecting the cable will activate MS Windows plug and play wizard.

## ***Power***

Once all the input and output connectors are in place, connect the supplied power cable to the AC input. If you are not in North America, you may use your own standard IEC320 power cable with the Avalon matrix switch. The Avalon will detect whatever

voltage is supplied (from 90V to 240V AC), and adjust accordingly.

### ***Rack Mounting***

If you purchased the optional rack mount ear kit, use the supplied screws to attach the ears. The rack ears are universal, so they fit on either side.

## Operation

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Once your Avalon matrix switch is plugged into AC power, it will go into standby mode. If you have chosen a model with an LCD display, the LCD backlight will be on low and “Standby” will appear on the display.

From this point, you are ready to begin controlling the matrix switch.

### ***Controlling from the front panel***

The Avalon matrix switch’s front panel uses NeoTouch™ technology. This is different from many other front panels you have seen with ‘membrane’ or ‘dome’ type buttons. The NeoTouch™ panel senses a human finger touching the acrylic panel without any moving parts. For you, the user, this means that you need not press hard to activate a button, a light tap will do.

Powering the Avalon matrix switch on and off is accomplished by pressing the power button.

The Avalon matrix switch will suggest to you what buttons to press next by illuminating the LEDs.

In the powered on and ready state, three LEDs will be lit; In, Audio, and Video.

**In** – Selecting the In button will begin the process of switching both audio and video.

**Audio** – Selecting the Audio button will begin the process of switching Audio only

**Video** – Selecting the Video button will begin the process of switching Video only.

Once one of the three In/Audio/Video buttons have been pressed, the Avalon matrix switch will light the inputs that are available for selection, **1 to 6** for 6x2 models, and **1 to 8** for 8x4 models. The 0 button will also be lit. Selecting 0 as the input number will mute whatever output is selected in the following steps.

After an input number has been selected, press the “**Out**” key.

And finally, after pressing “Out”, press the Output number **1 to 2** or **1 to 4** you wish to route the signal to.

To recap, the front panel is always done as a four-button sequence of **(In/Audio/Video)**, **(number)**, **(Out)**, **(number)**.

Some typical examples of this might be the following.

*Example 1* - You would like to route your Cable box on Input 5 to your main display on output 1. Press In, 5, Out, 1.

*Example 2* – You wish to now route your audio from your CD changer on input 3 to the main AV receiver on output 1, but continue watching the cable box from example 1. Press Audio, 3, Out, 1.

## ***Controlling from an IR remote control***

The command sequence for controlling the Avalon matrix switch from an IR remote control is exactly the same as controlling the switch from the front panel. If you have skipped ahead to this section, please go back and read the section “Controlling from the front panel” first.

If you have purchased the optional Neothings remote control, you will notice there are more buttons than are required to operate the Avalon matrix switch. These are for future use and are not used on this product.

Programmable remote controls can be supported by teaching the programmable remote the IR commands directly from the

Neothings remote, or by downloading pre-programmed files from the Neothings website.

# Controlling with USB

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Controlling the Avalon matrix switch with the PC's USB port will typically be used by a PC based control system. This next section gives the command protocol needed to program a control system to control the Avalon. A simple control application for MS Windows will be made available on the Neothings website, [www.neothings.com](http://www.neothings.com)

The Avalon matrix switch will be installed as a virtual COM port. This means that any control program capable of controlling a device through a normal serial port should be able to control the Avalon through a USB port.

## ***Driver Installation***

This driver set is for all versions of MS Windows. Linux and Mac drivers can be made available upon request.

The following process is for Windows XP, but other versions of Windows will be very similar.

Step 1 – Connect the cable



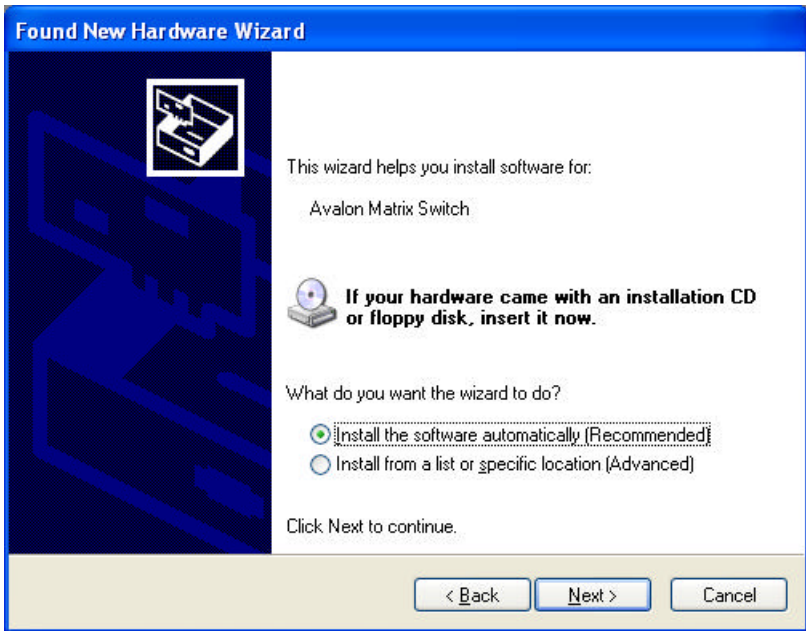
Windows will detect the new hardware, and launch the plug and play wizard.

## Step 2 – Found New Hardware Wizard



The first window will attempt to use the internet to find the driver, Select “**No, not at this time**”, and click **Next**.

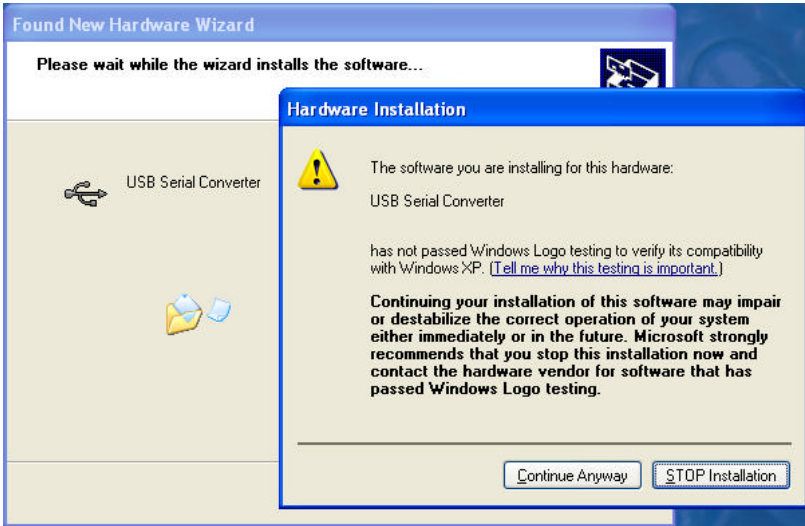
### Step 3 – Driver location



The next window attempts to find the driver disc. Insert the driver CD disc in the your CD-ROM drive if you haven't already.

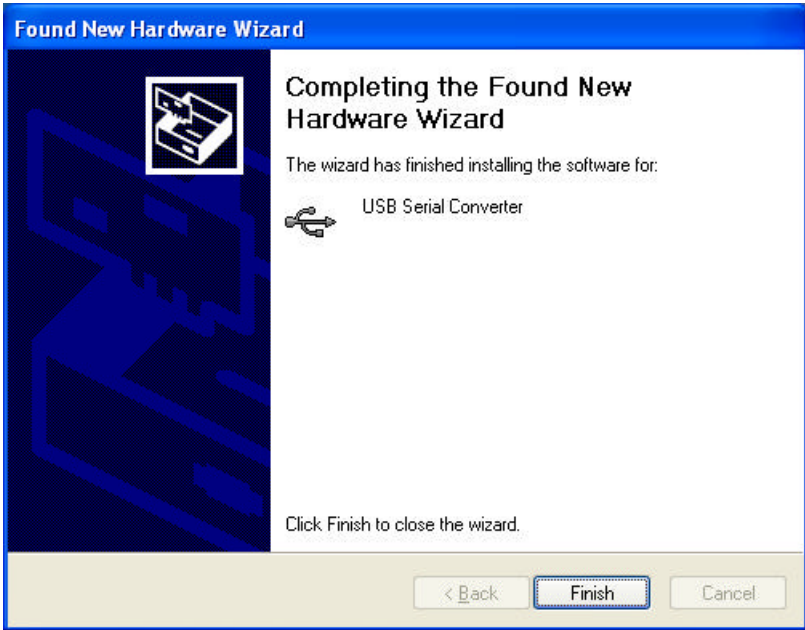
Leave the button labeled “**Install the software automatically (recommended)**” selected, and click **Next**.

## Step 4 – Continue Anyway



Windows will prompt on logo testing. Click “**Continue Anyway**”

## Step 5 – Completion of first half



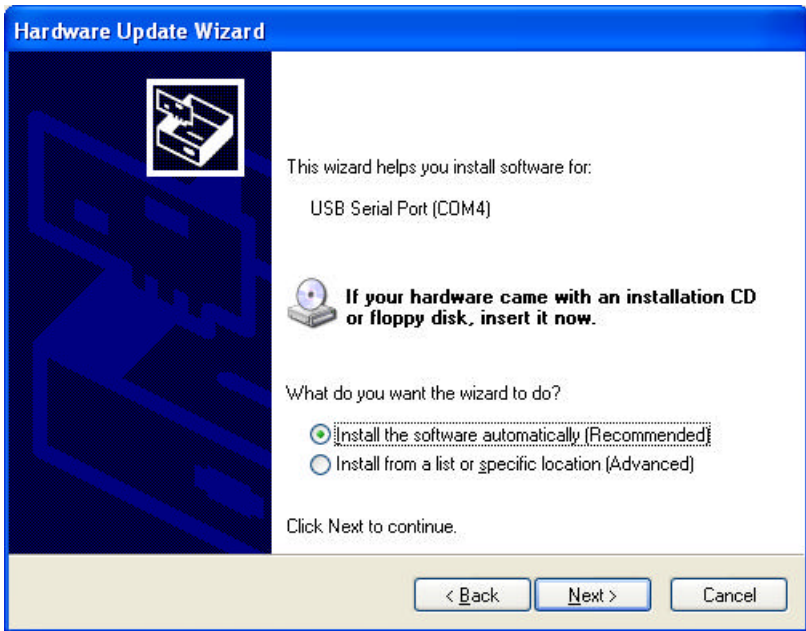
Click **Finish**.

## Step 6 – Installing virtual COM port driver



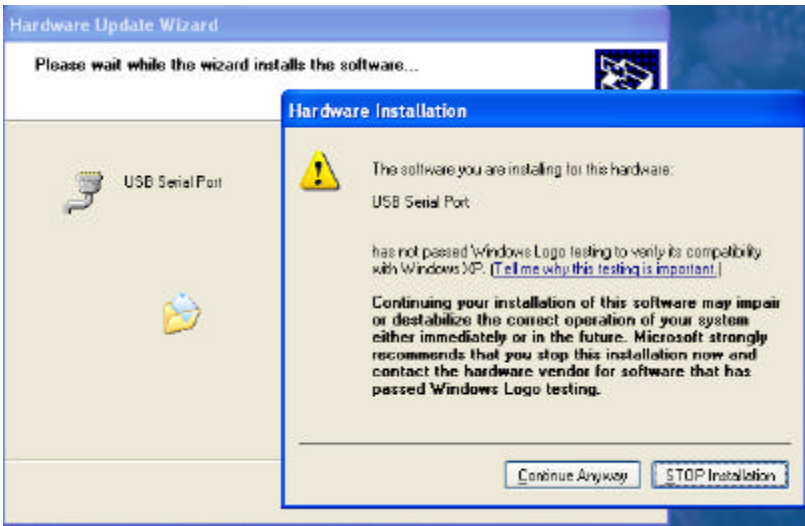
Windows will again start the new hardware wizard to install the virtual COM port driver. Click **“No, not this time”**, then click **Next**.

## Step 7 – Finding the driver



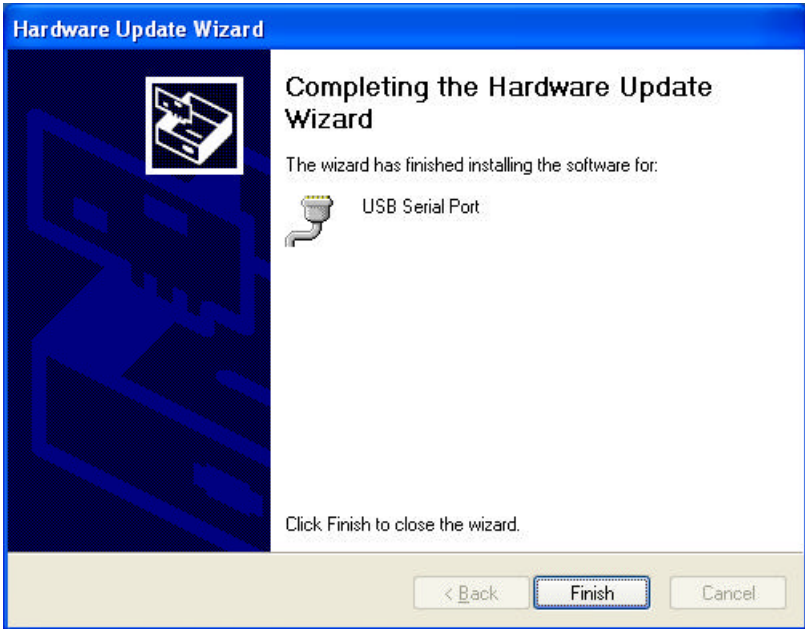
Leave the button labeled “**Install the software automatically (recommended)**” selected, and click **Next**.

## Step 8 – Continue Anyway



Windows will prompt on logo testing. Click **“Continue Anyway”**

## Step 9 – Completing the Hardware Update Wizard

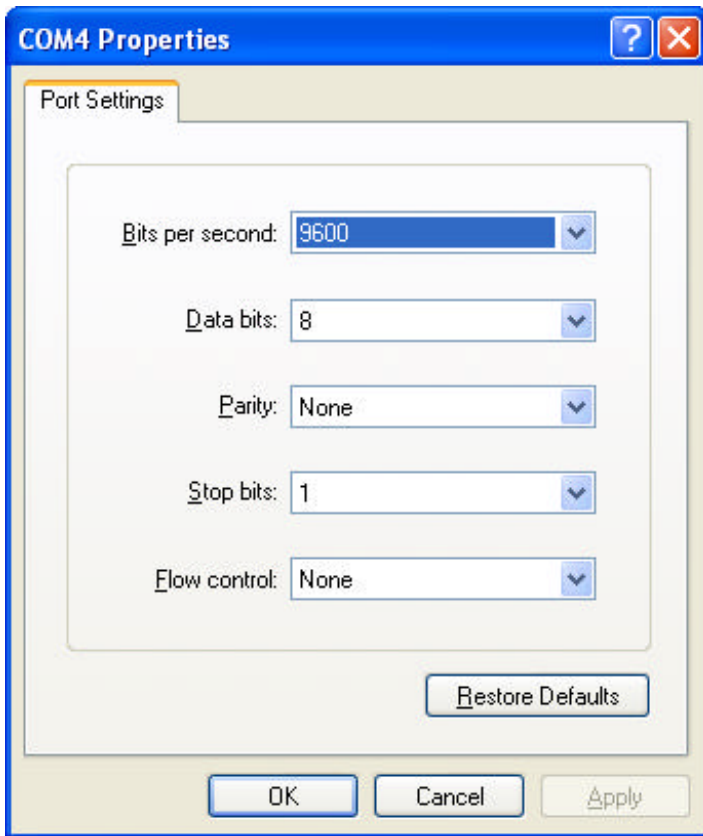


This is the final step, click **Finish**

At this point, the drivers are installed properly.

### ***USB Port Settings***

Whether using a Windows terminal program such as Hyperterminal or another application, the baud rate settings are the same: 9600 baud, 8 data, no parity, 1 stop, no flow control. The COM port shown in the following example may change depending on your computer.



## ***USB Commands***

The USB commands are structured so that an application program on the PC can communicate with the Avalon effectively. These commands are also human readable text, which may help in troubleshooting and testing.

The main concept to understand is that to the USB port, the Avalon matrix looks like two independent switches, a video switch and an audio switch. The video switch is referred to as Board #1 or B1,

and the audio switch is referred to as Board #2 or B2. For convenience, a virtual board #0, or B0, will control both the audio and video switches.

### **Command structure**

A command is always wrapped in square braces, and each field is separated by commas.

Structure prototype: [ B<sub>n</sub> , T<sub>n</sub> , x , x ]

B<sub>n</sub> = board number

B1 = video

B2 = audio

B0 = both audio and video

T<sub>n</sub> = board type

C2 = 6x2 component video switch

C4 = 8x4 component video switch

B2 = 6x2 digital audio switch

B4 = 8x4 digital audio switch

00 = type to use when selecting virtual switch B0

x,x = input channel [0-6 or 0-8], output channel [1-2 or 1-4]

Selecting input 0 effectively disables (mutes) that output

Examples:

[ B0 , 00 , 2 , 4 ]

switches input 2 to output 4 on both switches

[ B2 , B2 , 6 , 1 ]

switches input 6 to output 1 on the digital audio 6x2 switch

The serial port will not echo characters back to the sender. Instead once the command is completed, the response will be sent back as shown in the Query section below, and depending on the verbosity settings.

### ***Setup and Misc commands***

The following commands are stored in EEPROM memory, so they will still be set after a power outage.

[S,a,n]

S = Setup function

a=function letter, n=argument

L=lights on the front panel

0=blackout

1=normal state (default)

R=Front IR receiver

0=disabled

1=enabled (default)

B=Front panel buttons

0=disabled

1=enabled (default)

V=Verbosity

0=respond only when sent a command

1=any change in state from front, IR, or other ports are sent out like queries (default)

[P,n]

P=power control

0=power off

1=power on

The response to these commands is the same as the command itself (i.e. sending [ P , 1 ] will get a response of [ P , 1 ])

### **Query commands**

[ ?B0 ]

Putting a “?” inside the bracket, followed by Bn will return the full structure of the switch(es) being queried.

Since there are up to four outputs on each board, up to four structures will be returned per board.

Querying a single board will invoke a single board structure response, but querying a macro such as B0 will invoke all boards to respond.

Example response to [?B0] on an 8x4 switch will look like:

```
[ [ B1 , C4 , 3 , 1 ] [ B1 , C4 , 2 , 2 ] [ B1 , C4 , 6 , 3 ] [ B1 , C4 , 2 , 4 ]  
 [ B2 , B4 , 3 , 1 ] [ B2 , B4 , 2 , 2 ] [ B2 , B4 , 3 , 3 ] [ B2 , B4 , 2 , 4 ] ] ]
```

Note that there is another level of braces that wraps the entire query response.

Example response to [?B1] on an 6x2 switch will look like:

```
[ [ B1 , C2 , 3 , 1 ] [ B1 , C2 , 2 , 2 ] ] ]
```

[?V]

Returns product ID and version

Product ID for the Avalon switch is A, and first version will be 1.0, so the return will be

[V,A10]

[?S]

Returns all setup parameters. i.e.:

[[S,L,1][S,R,1][S,B,1][S,V,1]]

[?P]

Returns power state

[P,1]

## **Errors**

The Avalon switch will only attempt to process a command between matching [ and ] braces, so garbage before and after the braces is thrown away. However the characters between the braces will be processed, and if invalid, an error signal is sent.

Any command syntax error will result in a response of [E]

## **Maximum Response Time**

Maximum time to process any command and complete the serial response, is 150mS.

## ***Uninstalling the USB drivers***

There is typically no harm in leaving the drivers installed in Windows. It is usually desired to keep them installed so that when the device is plugged back in, it will be recognized automatically and assigned the same COM port number.

However, if you need to uninstall the drivers for any reason, use the Windows Control panel to do so.

To Uninstall:

Click the **Start** Menu

Select **Settings**, then **Control Panel**

Click **Add or Remove Programs**

Find **Neothings Avalon USB Drivers**

Click **Change /Remove**

Follow the on screen instructions.

## Care and Maintenance

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The Avalon matrix switch does not require any regular maintenance besides keeping it clean.

Never use harsh cleaners or solvents on the Avalon front panel. There are several dusting products for electronics, and standard glass cleaner may be used.

Spray any liquids onto a towel first, then wipe the front of the Avalon with the moist towel.

Should the Avalon matrix switch fail to operate as expected, please contact Neothings for service advice. **THERE ARE NO ADJUSTMENTS OR USER SERVICEABLE PARTS INSIDE THE CABINET.**

## **Restoring to Factory Defaults**

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Just in case you should disable the front panel or IR input via the USB port, you may require a way to restore those features without using the USB port again. To restore the Avalon matrix switch back to factory settings, do the following:

- ✓ Unplug the Avalon for 10 seconds, then plug it back in. The Avalon should be in standby mode.
- ✓ On the front panel, press 0, 0, 7.

The Avalon will then enter Initialization, and when complete, return to standby mode. The front panel and IR will work as normal.

# Specifications

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## Performance

Video	
Input coupling	AC
Input impedance/termination	75 ohms
Output coupling	DC
Output impedance	75 ohms source terminated
Output video bandwidth (-3dB)	100 MHz
Crosstalk	Below -80dB
Video modes	480i, 480p, 540i, 540p, 576i, 576p, 720p, 1080i, 1080p
Video vertical rates	24, 25, 29.97, 30, 50, 59.97, 60

## Audio

SPDIF input termination	75 ohms
SPDIF input minimum signal	200mV
SPDIF + Toslink max data rate	12Mb/sec
SPDIF output signal	500mV AC coupled

## Power

Input voltage	90-240V AC 50-60Hz autosensing
Input power consumption	7W "On", 3W "standby"

## Physical

Dimensions	17"W x 3.5"H x 10.75"D
Dim. with feet (removable)	17"W x 3.75"H x 10.75"D
Unit Weight	8.8 lbs
Shipping weight	11 lbs

## **2 Year Warranty**

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Neothings, Inc. warrants this product against defects in material and workmanship for a period of 2 years. This warranty applies to the original end-user purchaser. Neothings will, solely at its option, repair or replace this product with a functionally equivalent new or factory-reconditioned product during the warranty period. The consumer will deliver the product to Neothings. All transportation risks and costs in connection with this warranty service are the responsibility of the consumer.

In order to keep this warranty in effect, the product must have been handled and used as prescribed in the instructions accompanying this warranty. This warranty does not cover any damage due to accident, misuse, abuse, or negligence. Repair or replacement, as provided under this warranty, is your exclusive remedy. Neothings shall not be liable for any incidental or consequential damages. Implied warranties of merchantability and fitness for a particular purpose on this product are limited to the duration of this warranty.

Some states/countries do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. Some states/countries do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. This warranty gives you specific legal rights, and you may also have other rights that vary from state to state and country to country.



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