



TC2000 Transcoder Users Manual



Introduction

The **Crescendo-Systems TC2000** transcoder is a highly flexible device to connect your computer to your HDTV monitor. The **TC2000** has been tested for 480p, 540p and 720p, but will support other nonstandard resolutions. In contrast to most other transcoders on the market, the **TC2000** is fully transparent with respect to timing and is therefore optimally suited to drive a variety of display devices.

Also unique, is the fact that the **TC2000** supports both color conversions for 480p and 720p/1080i in order to provide optimum color fidelity. Although the required conversions are nearly identical, the difference cannot be ignored when optimum quality is pursued.

In order to use the **TC2000** on a computer the timing has to be set such that the display device will accept it. A freeware program called PowerStrip™ is available from [Entechtaiwan](http://www.entechtaiwan.com) that can assist to achieve this. There are various guides available that explain PowerStrip in detail, an excellent one is on the [AVSForum](http://www.avsf.com) and a second one is available at [KeohiHDTV](http://www.keohihd.com).

Warning! Setting incorrect scan-frequencies can seriously damage your TV, Crescendo-Systems takes no responsibly implied or otherwise and Crescendo-Systems' total liability to any customer for any and all claims relating to the use of the **TC2000** shall not exceed the total amount paid by such user to Crescendo-Systems for obtaining this product.

Specifications

The **TC2000** offer the user total flexibility and has the following specifications and features:

- Highly flexible VGA (RGBHV) to Component (YPrPb) transcoder
- Buffered VGA loop-through
- Transparent timing supports most video formats, interlaced or progressive
- User selectable color conversion
- Drives cables of up to 50 feet (16m)
- High bandwidth (>130MHz) signal processing
- Input on a female VGA connector
- Loop-through output on a female VGA connector. Gain=1 when driving 75 Ohm
- Component (YPrPb) output on three color-coded RCA connectors. Vout=1Vp-p when driving 75 Ohm

Included in this package are one **TC2000** and one external power supply. The manual with warrantee statement will be sent by email and optionally can be directly downloaded from the Crescendo-Systems website.

Setup

In order to successfully use your **TC2000** just follow the simple steps outlined below.

1. Make sure that your source device has the ability to correctly set the timing needed by your display. **If this is not the case, do not use the TC2000.**
2. Connect your source to the **TC2000** using a VGA cable with male HD15 connector.
3. Connect the **TC2000** to your display using the Component output jacks. Additionally, you can connect a VGA monitor to the VGA (loop-through) output.
4. Make sure that the source device has the correct timing setup, if necessary verify this by using a multi-sync monitor connected to the loop-through output. This is an important step and should not be taken lightly. When using PowerStrip™ please familiarize yourself with this program first.
5. Select the desired color conversion by choosing the polarity of the sync:
 - a. H-sync and V-sync negative: color conversion for 480p
 - b. H-sync and V-sync positive: color conversion for 540p/720p/1080iBe sure to always set the same polarity for H-sync and V-sync, otherwise your display may not correctly lock to the signal and may become damaged.

6. Connect the power supply to the transcoder. Use only the supplied unit or an exact equivalent.

Technical details and tips

The **TC2000** implements the following two color conversions.

For 480p:

$$\begin{aligned} Y &= 0.2990R + 0.5870G + 0.1140B \\ Pb &= 0.5643 (B-Y) = -0.1687R - 0.3312G + 0.5B \\ Pr &= 0.7133 (R-Y) = 0.5R - 0.4187G - 0.0813B \end{aligned}$$

For 540p/720p/1080i:

$$\begin{aligned} Y &= 0.2126R + 0.7152G + 0.0722B \\ Pb &= 0.5389 (B-Y) = -0.1146R - 0.3854G + 0.5B \\ Pr &= 0.6350 (R-Y) = 0.5R - 0.4542G - 0.0458B \end{aligned}$$

Because of the transparent timing, the **TC2000** relies on the source device or a program like PowerStrip™ to set the correct horizontal and vertical sync width. A TV expects a H-sync width of around 2μs for 480p and around 1μs for 540p/720p/1080i. If the H-sync width is too long, the picture will look washed out with a white haze on it. A computer monitor on the loop-through will not show this effect because this kind of monitor is highly insensitive to the H-sync width.

If the picture looks washed out, try reducing the width of the H-sync, while keeping the scan frequencies locked, until the picture looks good and a further reduction makes no difference anymore. Do not reduce the H-sync width too much, 0.6μs is normally the minimum width before a TV loses lock.

Warranty

Crescendo-Systems designs and builds all products with the highest of care and every product should operate trouble-free for many years when used under normal operating conditions. Therefore, every **TC2000** carries a 1-year no-hassle replacement warranty. Should a warranty replacement be needed, please contact sales@crescendo-systems.com first.

Development history

The **TC2000** transcoder was developed in the [AVSForum](#) to be flexible and to provide impeccable visual quality. Many people have contributed to the development of this transcoder that originated as an idea by Jon Rhees. In particular I would like to mention DPW666 that started it all, Icen, scitech76, Jig, gregr, PeterAM and many others for the technical discussions and of course debennett2 for his relentless pursuit for perfection and ultimately the driving force to this end-result.