



Instruction Manual

SD-210AD
Analog to SDI Converter

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1.0 INTRODUCTION

Thanks for purchasing this SD-210AD Analog to SDI Converter from TV One. The SD-210AD is designed to convert analog video (composite, Y/C and component) signals into 270 Mb/s SDI. Our professional video conversion products have been serving the industry for over twenty years. TV One offers a full line of high quality Video Scalers, Scan Converters, Analog-Digital (DV, SDI, DVI) Converters, Standards Converters, Digital Video Recorders, Frame Synchronizers, Time Base Correctors, LCD Monitors, Matrix Routing Switchers and Distribution Amplifiers.

1.1 Liability Statement

Every effort has been made to ensure that this product is free of errors. TV One cannot be held liable for the use of this hardware or any direct or indirect consequential damages arising from its use. It is the responsibility of the user of the hardware to check that it is suitable for his/her requirements and that it is installed correctly. All rights reserved. No parts of this manual may be reproduced or transmitted by any form or means electronic or mechanical, including photocopying, recording or by any information storage or retrieval system without the written consent of the publisher.

TV One reserves the right to revise any of its hardware and software following its policy to modify and/or improve its products where necessary or desirable. This statement does not affect the legal rights of the user in any way.

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1.2 FEATURES

The SD-210AD has many features that enable it to perform in a superior manner. Among those features you will find:

- 10-bit Signal Processing
- 5-Line Adaptive Comb Filtering
- Serial Digital Video Output at 270Mbits/sec
- Composite, S-Video, YUV Inputs
- Video Processing Amplifier Adjustments
- NTSC, PAL-B, G, N, M and SECAM Operation
- Desktop Cases with Optional Rackmount

2.0 SPECIFICATIONS

Analog Video Inputs	
Composite	1x via BNC Connector
S-Video (Y/C)	1x via 4-PIN Mini-DIN
Component (YUV or RGB)	1x via 3 BNC Connectors
Television Standards	NTSC, NTSCJ, PAL-B,G,N,M, SECAM
Impedance	75Ω
SDI Video Output	
SMPTE 259M, 270Mbits/sec	2x via BNC Connectors, Signals are ITU-R BT.601 and ITU-R BT.656 compliant
Video Specifications	
Signal Processing	10-bit
Frequency Response	Flat to more than 6MHz
Chroma to Luma Delay	≤ 5 nS
Differential Gain	≤ 0.5 %
Differential Phase	≤ 0.5 °
Luminance Non-linearity	≤ 1 %
K Factor	≤ 0.8 %
Signal to Noise Ratio	
Black Field, weighted	Better than 70 dB
White Field, weighted	Better than 67 dB

3.0 CHECKING PACKAGE CONTENTS

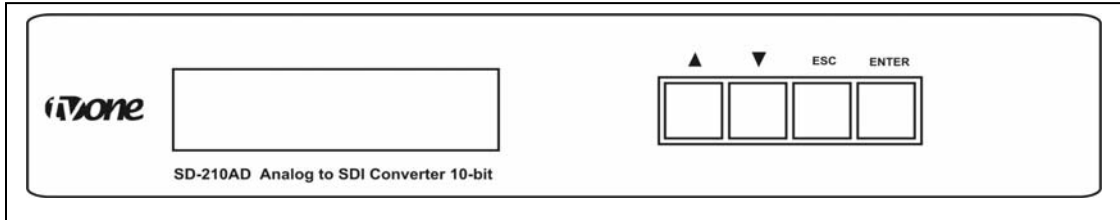
Before attempting to use this unit, please check the packaging and make certain the following items are contained in the shipping carton:

- SD-210AD Analog to SDI Converter.
- 100/240 VAC@50/50 Hz to +5 VDC Power Adaptor
- 6' (2m) BNC to BNC Cable
- Operation Manual

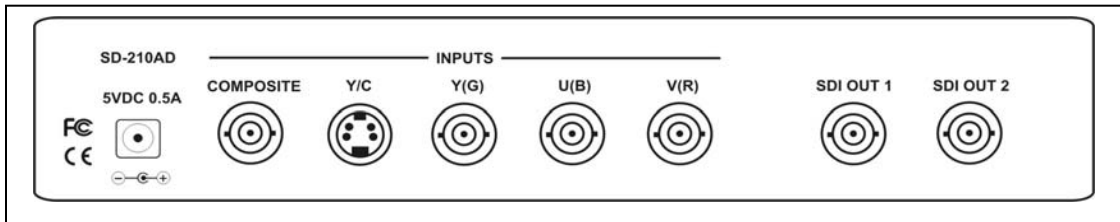
Note: Please retain the original packing material should the need ever arise to return the unit. If you find any items are missing, contact your reseller or TV One immediately. Have the Model Number, Serial Number and Invoice available for reference when you call.

4.0 CONNECTING THE HARDWARE

Please study the panel drawings below and become familiar with the signal input, outputs, power requirements plus any controls present.



SD-210AD Front Panel



SD-210AD Rear Panel

4.1 Input / Output Connections

Connect the analog video source(s) to the corresponding BNC connectors and then the output(s) to their BNC connectors.

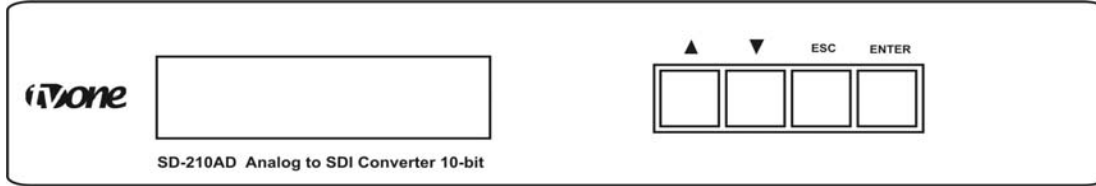
Note: Both SD-210AD outputs are active. They can be used simultaneously or just one of the outputs can be used according to the user's needs.

4.2 Connecting Power to the Unit

The SD-210AD is shipped with an AC Power Adapter to convert 100~240VAC@50-60Hz to +5 VDC. Connect the DC Output Cable from the Power Adapter to the back of the unit and then plug the Power Adapter into an AC Receptacle. When the unit is plugged in, the front panel LCD indicator will illuminate.

5.0 OPERATING THE UNIT

The SDI to Analog converter is controlled via four buttons and status is indicated on the front panel LCD.



- **▲ and ▼ Buttons:** These buttons allow navigation within the Menu and adjustment of the operational parameters.
- **Enter Button:** Allows entering the secondary menus or confirms menu item selection.
- **ESC Button:** ESCapes from the current selection, going up one menu level, Without any changes to the previous setting.

5.1 Status

As soon as the unit is plugged in (and after initialization and recalling of the values and settings stored in the non-volatile memory), the SD-210AD LCD shows **TVOne SD-210AD** on the first line and Input Signal Status on the second line: **INPUT ABSENT** or **INPUT Std**, where 'Std' is the signal type present at the selected input, if there is video present.

When status is displayed, depressing the **Enter** button sets the gain settings to unity as the default condition, sets image sharpness to flat (factory calibration) plus updates the non-volatile memory with these values.

If you depress **ESC**, the LCD display shows Selected Input Format, Levels and Gain Status on the display's second line. (For example, it may show: **YUV SMPTE CAL**, indicating component output is YUV with SMPTE levels plus all level controls [Luma, Chroma and Set Up] are at unity gain.)

Alternatively, it could show **YUV BCAM UNCAL**, (if Component Output with Betacam® Levels has been selected), provided one or more of the level controls has been set to a value other than unity.

Another possibility is **RGB CAL**, if RGB output has been selected.

5.2 Main Menu

Depressing the arrow buttons (▲ or ▼), when status is being displayed, allows navigation through the Main Menu. The options are:

Luma Level
Chroma Level
Set Up Level
Sharpness Adj.
Input Standard
Input Filter
Input Format
Adv. Settings

Press **Enter** to select the desired option or press **ESC** to go back to the Status display.

Note: All settings (e.g. Luma, Chroma and Set Up levels, all Advanced Settings, etc) are stored in non volatile memory for each standard and retrieved when the standard is selected.

5.2.1 Luminance Level

When this option is selected, the LCD's first line shows **Adjust Luma** and the second line will indicate **Gain = X.XX**, (where X.XX is the current gain level factor).

▲ or ▼ increases or decreases the Luma level.

Output luminance changes in step with the displayed value. Pressing **Enter** saves this value to the non-volatile memory and returns you to the **Main Menu**. Pressing the **ESC button** will cycle you back to the **Main Menu** without saving the adjustment. (To amplify on this point a bit, even though you didn't save the new value, pressing the **ESC button** does not return the unit to the value that was present before the change was made. The change you made is still present until you remove power from the unit. When you next apply power, the last saved value will appear. If you want the new value you just created to appear the next time you apply power, you have to save it first as explained above).

Steps are 0.05 (5 %) each, with a maximum level of 2.00 (100 % increase) and a minimum level of 0.00 (no luminance output).

5.2.2 Chroma Level

Chroma level adjustment is accomplished the same way as the luma level described above—you select Chroma from the menu after which the same rules that governed Luma adjustments apply to Chroma adjustments.

Steps, maximum and minimum levels are also the same.

5.2.3 Set Up Level

Set up level adjustment is very similar to Luma and Chroma levels but with a few differences.

First, the value shown is relative, not the absolute gain as with the others. This value varies from 00 (no set up) up to + 31 and down to –32 (thereby crushing blacks) in steps of 1.

In the case of NTSC, set up level is referenced to the standard 7.5 IRE pedestal.

5.2.4 Sharpness Adjustment

The SD-210AD has a digital luminance sharpness response control that allows the user to enhance or attenuate the high frequency components of the luminance.

▲, ▼, ESC and **Enter** behave the same way as in the level control sub menus.

There are seven possible choices: Flat plus three Enhancement and three Attenuation filters. (Remember, adding sharpness will often add high frequency noise to the picture as well).

Available gain and attenuation values depend on the Input format selected (see 5.2.7), as follows:

For composite input, gain choices are: + 1.2 dB, + 1.7 dB and + 4.5 dB; while attenuations choices are: - 1.2 dB, - 1.7 dB and –3.0 dB

Y/C or YUV inputs have the following choices: + 3.3 dB, + 5.7 dB and + 9.2 dB; - 3.0 dB, - 5.7 dB and –8.0 dB

Note: As these last formats don't require separation, luminance input is usually cleaner and, generally, gives more processing margin to the user.

5.2.5 Input Standard

When this option is selected, the LCD's first line shows: **Sel Input Std**, and the second line will show the current standard.

The **▲** and **▼** buttons allows selection of PAL, PALN, NTSC, NTSCJ (NTSC without pedestal), PAL M and SECAM.

Input Standard changes takes effect after pressing **Enter**, which stores the selection in the non-volatile memory. Confirmation of the change is shown on the LCD's second line via the text ***OK** after the new standard selection has been stored. To return to the **Main Menu**, press the **ESC** button.

(Note: The output standard is not modified until **Enter** is depressed, a difference from the way the level controls work. **ESC** takes you back to the **Main Menu** without any change to the selected standard).

5.2.6 Input Filter

The SD-210AD allows the user to choose which kind filter topology is to be used for luma/chroma separation.

When selecting this option, if the input format chosen is Composite, the first line of the LCD shows **Select Filter** and the second line on the display shows the current option.

The arrow buttons, **▲** and **▼**, allows selection of either Adaptive Comb or Low Pass filters. (This Low Pass filter is the one selected through the Filter Select option (section 5.2.8.3) under Advance Settings (section 5.2.8) menu.)

When selecting any of the other input formats, the LCD display will show **Not Applicable** and, after a few seconds, the unit will revert to the **Main Menu**

(Note: The input filter selection is not accepted until **Enter** is depressed, as was the case with the Input Standard functionality described in section 5.2.5. **ESC** takes you back to the **Main Menu** without any change to the selected input).

5.2.7 Input Format

The SD-210AD allows the user to choose which input signals are processed by the decoder and sent to the digital encoding circuitry for generation of the SPMTE 259M SDI output signal.

When this option is selected, the first LCD line will show **Input Format** and the second the format currently in use.

The arrow buttons, ▲ and ▼, allow selection of one of the following options:

Composite
Y/C
YUV SMPTE/EBU
YUV BETACAM

The **Enter** and **ESC** buttons behave the same way as the functionality described in 5.2.5 and 5.2.6.

5.2.8 Advance Settings

This menu gives the experienced user the possibility of adjusting parameters to compensate for unexpected anomalies.

We strongly recommend the non experienced or novice user leave these settings in their factory default value, which in most of the cases are well above the minimum requirements for normal situations.

Misuse of these settings may result in an undesirable picture.

5.2.8.1 Luma AGC

Through this option the luminance AGC input circuitry can be **Enabled** or **Disabled**.

When enabled, gain is referenced to the sync level; when disabled it is fixed.

▲, ▼, ESC and Enter behave the same way as in the level control sub menus.

5.2.8.2 Chroma AGC

Similarly, this option allows operation of the chrominance AGC.

When enabled, gain is referenced to the color burst; when disabled it is fixed.

5.2.8.3 Filter Select

This option allows choosing among different options of luminance low pass filters and is only available when the input signal format is Composite Video.

To be able to enter filter selection, the unit has to be set for Low Pass Filter operation (section 5.2.6).

Different filters are numbered starting at 1 (corresponding to the lowest cut off frequency) to the highest number which corresponds to the highest cut off

frequency available. Quantity of options depends on the input standard selected (section 5.2.5).

When entering the menu current filter number appears and with the arrow buttons, ▲ and ▼, you can go down until Filter 1 and up to the maximum.

*Note: A preview of the filter action is shown when scrolling through the menu. Pressing **Enter** confirms the selection and stores it in non volatile memory while pressing **ESC** accepts the last filter setting viewed as a selection but doesn't store it in memory.*

5.2.8.4 U/V Gain/Offset

Through this option, U or (B-Y) and V or (R-Y) gains and offsets can be independently adjusted giving the user the possibility of doing some kind of color correction to the input video.

Again, by means of the arrow buttons and Enter, the user can choose among the following options:

5.2.8.4.1 U (B-Y) Gain

This option allows the gain of the U or (B-Y) component of the chroma signal to be varied.

Shown values are relative: 0 means no change, positive values, increase and negative decrease the base overall chroma gain level.

▲, ▼, ESC and Enter behave the same way as in the level control sub menus.

5.2.8.4.2 U (B-Y) Offset

By means of this option, the offset of the U component for no chroma (center position in a vectorscope) can be varied.

Again, this value is relative to the zero value.

Operation is similar to the Gain explained above.

5.2.8.4.3 V (R-Y) Gain

As for U Gain, this sub menu allows altering the value of the V or (R-Y) component of the chroma signal.

Operation is analog.

5.2.8.4.4 V (R-Y) Offset

As in the case of U, this option allows offsetting the V or (R-Y) zero point through the Y axis.

Operation and considerations are similar.

5.2.8.4.5 Normalize

By pressing Enter over this option, color correction function is reset, i.e., all the above values are set to zero. This is a rapid way to return the unit to standard operation.

Note: *To avoid saturations or other malfunctions when trying to modify the gains of any of the components, chroma gain is automatically set to unity giving the user the widest possible control range.*

When entering the Chroma Level control sub menu (5.2.2) the previous value is restored and the independent U and V relative gains are set to zero. Independent offsets are not modified.

5.2.8.5 CTI

Chroma Transient Improvement circuitry is provided in case the user needs to improve the response of the chroma signal. It is an artificial enhancing recommended when the input signal experiences severe bandwidth limitation in the chroma channel.

Options are:

Disable
No Mix
Mix 1
Mix 2
Mix 3
Mix 4

Navigating through the options, the user will see the effect of the improvement, No Mix outputs only the bandwidth enhanced signal, while the different mixes add—in different amounts—the sharpened chroma signal to the original one.

▲, ▼, ESC and Enter behave the same way as with other options in this menu.

5.2.8.6 Noise Reduction

Digital noise reduction may be added to process which need noise removal.

Following options are provided:

- Disable
- Low
- Mid 1
- Mid 2
- Mid 3
- High

Operation and response is similar to the above case.

5.2.9. Factory Settings

Recommended, factory default levels, for proper operation and response to convert normal quality signals is:

- Luma AGC: Enabled
- Chroma AGC: Enabled
- Low Pass Filter: Highest for the standard
- U (B-Y) Gain: 0
- U (B-Y) Offset: 0
- V (R-Y) Gain: 0
- V (R-Y) Offset: 0
- CTI: Disabled
- Noise Reduction: Disabled

6.0 TROUBLESHOOTING

Other than checking for faulty cables, the other common problem would be operating with a wrong standard. Make sure the selected input standard and format match the input connections.

After trying the above suggestions should the problem still persist, contact your dealer for additional suggestions before contacting TV One. Should the dealer's technical personnel be unable to assist you, contact TV One via our support website: <http://tvone.crmdesk.com>. Create a technical support request on the site and our support team will respond within a short period of time.

7.0 LIMITED WARRANTY

LIMITED WARRANTY – With the exceptions noted in the next paragraph, TV One warrants the original purchaser that the equipment it manufactures or sells will be free from defects in materials and workmanship for a period of two years from the date of purchase. Should this product, in TV One's opinion, prove defective within this warranty period, TV One, at its option, will repair or replace this product without charge. Any defective parts replaced become the property of TV One. This warranty does not apply to those products which have been damaged due to accident, unauthorized alterations, improper repair, modifications, inadequate maintenance and care, or use in any manner for which the product was not originally intended.

Items integrated into TV One products that are made by other manufacturers, notably computer hard drives and liquid crystal display panels, are limited to the term of the warranty offered by the respective manufacturers. Such specific warranties are available upon request to TV One.

If repairs are necessary under this warranty policy, the original purchaser must obtain a Return Authorization Number from TV One and return the product to a location designated by TV One, freight prepaid. After repairs are complete, the product will be returned, freight prepaid.

LIMITATIONS - All products sold are "as is" and the above Limited Warranty is in lieu of all other warranties for this product, expressed or implied, and is strictly limited to two years from the date of purchase. TV One assumes no liability to distributors, resellers or end-users or any third parties for any loss of use, revenue or profit.

TV One makes no other representation of warranty as to fitness for the purpose or merchantability or otherwise in respect of any of the products sold. The liability of TV One with respect to any defective products will be limited to the repair or replacement of such products. In no event shall TV One be responsible or liable for any damage arising from the use of such defective products whether such damages be direct, indirect, consequential or otherwise, and whether such damages are incurred by the reseller, end-user or any third party.

8.0 REGULATORY COMPLIANCE

This product has been tested for compliance with: FCC Class B and CE.

The Power Adapter has been tested for compliance with: UL, CSA and CE.



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