Kramer Electronics, Ltd.

USER MANUAL

Model:

7508

CV / YC to SDI Converter

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This addendum adds the following information to the user manual:

Caution – No operator-serviceable parts inside unit.

Warning – Use only the Kramer Electronics input power wall adapter that is provided with this unit[1].

Warning – Disconnect power and unplug unit from wall before installing or removing device or servicing unit.

1 For example: model number AD2512C, part number 2535-000251

1 Introduction

Welcome to Kramer Electronics (since 1981): a world of unique, creative and affordable solutions to the infinite range of problems that confront the video, audio and presentation professional on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better! Our 350-plus different models now appear in 8 Groups[1], which are clearly defined by function.

Congratulations on purchasing your Kramer DigiTOOLS **7508** *CV / YC to SDI Converter*, which is ideal for broadcast and production video studios, postproduction and duplication studios, and non-linear editing. The package includes the following items:

- **7508** *CV / YC to SDI Converter*
- Power supply
- Null-modem adapter and Windows®-based Kramer control software
- This user manual[2] and the Kramer concise product catalog/CD

2 Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment
- Review the contents of this user manual
- Use Kramer high performance high resolution cables[3]

3 Overview

The high quality Kramer DigiTOOLS **7508** *CV / YC to SDI Converter* is a multi-standard converter of analog video (composite and s-Video) to SMPTE-259M serial digital video (SDI). Many professional video units on the market today, such as Betacam decks and DVD players have high quality analog outputs, and the **7508** is ideal for preserving the quality, and minimizing the artifacts, when converting to the digital domain.

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1 GROUP 1: Distribution Amplifiers; GROUP 2: Video and Audio Switchers, Matrix Switchers and Controllers; GROUP 3: Video, Audio, VGA/XGA Processors; GROUP 4: Interfaces and Sync Processors; GROUP 5: Twisted Pair Interfaces; GROUP 6: Accessories and Rack Adapters; GROUP 7: Scan Converters and Scalers; and GROUP 8: Cables and Connectors

2 Download up-to-date Kramer user manuals from the Internet at this URL: http://www.kramerelectronics.com/manuals.html

3 The complete list of Kramer cables is on our Web site at http://www.kramerelectronics.com (click "Cables and Connectors" in the Products section)

In particular, the **7508**:

- Converts the SDI on 2 buffered and reclocked SDI outputs

- Automatically detects the input standard (50/60Hz), generating the appropriate output

- Uses true 10-bit digitizing, making it ideal for the most demanding applications

- Has an RS-232 port and can be controlled via a user-friendly Windows®-based program that can modify video parameters such as contrast, saturation and hue, which may be stored in non-volatile memory

To achieve the best performance:

- Connect only good quality connection cables, thus avoiding interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables)

- Avoid interference from neighboring electrical appliances that may adversely influence signal quality and position your Kramer **7508** away from moisture, excessive sunlight and dust

4   Your 7508 CV / YC to SDI Converter

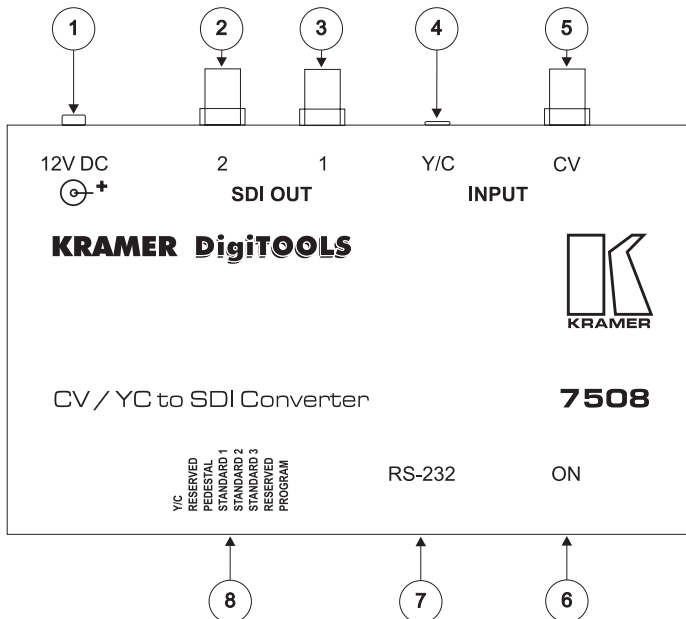Figure 1 and Table 1 define the **7508** *CV / YC to SDI Converter*:

Figure 1: 7508 CV / YC to SDI Converter

Table 1: 7508 CV / YC to SDI Converter Features

#	Feature	Function
1	*12V DC*	+12V DC connector for powering the unit
2	*SDI OUT 2* BNC Connector	Connects to the SDI acceptor 2
3	*SDI OUT 1* BNC Connector	Connects to the SDI acceptor 1
4	*Y/C INPUT* 4p Connector	Connects to the s-Video source
5	*CV INPUT* BNC Connector	Connects to the composite video source
6	*ON LED*	Illuminates when receiving power
7	*RS-232* Port	Connects to the PC or the Remote Controller
8	Dipswitches	Dipswitches for setup of the unit

5   Using Your 7508 CV / YC to SDI Converter

You can use your **7508** *CV / YC to SDI Converter* to convert professional quality composite video or s-Video (as the example in Figure 2 illustrates) to one or two SDI video outputs.

To convert composite video or s-Video to up to 2 SDI video outputs, do the following[1]:

1. Connect a composite video source (for example, a VCR) to the CV BNC INPUT connector.

2. Connect an s-Video source (for example, a camera) to the Y/C 4p INPUT connector.

3. Connect both SDI outputs to SDI acceptors as follows (when only one SDI output is required, use either of the SDI outputs of the **7508**, and leave the other SDI output unconnected):

   • Connect the SDI OUT 1 BNC connector to an SDI acceptor (for example, an SDI monitor)

   • Connect the SDI OUT 2 BNC connector to the second SDI acceptor (for example, an SDI monitor)

4. Set the dipswitches, as section 5.2 describes

5. Connect the 12V DC power adapter to the power socket and connect the adapter to the mains electricity.
   The composite video[2] or s-Video[3] signal converts to SDI at both SDI OUT 1 and SDI OUT 2.

6. Connect a PC (if required) to the RS-232 port (see section 5.1).

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1 Switch OFF the power on each device before connecting it to your 7508. After connecting your 7508, switch on its power and then switch on the power on each device

2 To choose the CV input, set the Y/C (DIP 1) OFF

3 To choose the Y/C input, set the Y/C (DIP 1) ON
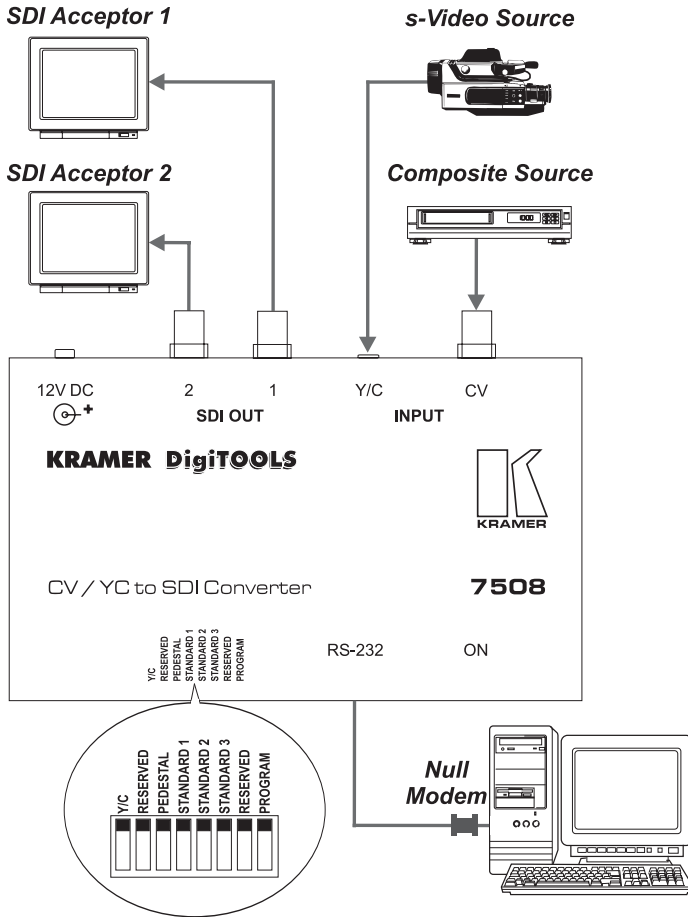
Figure 2: Connecting a 7508 CV / YC to SDI Converter

5.1 Connecting a PC

To connect a PC to the **7508** unit, using the Null-modem adapter provided with the machine (recommended):

- Connect the RS-232 DB9 rear panel port on the **7508** unit to the Null-modem adapter and connect the Null-modem adapter with a 9 wire flat cable to the RS-232 DB9 port on your PC

To connect a PC to the **7508** unit, without using a Null-modem adapter:

- Connect the RS-232 DB9 port on your PC to the RS-232 DB9 rear panel port on the **7508** unit, as Figure 3 illustrates (depending on whether the PC has a 9-pin or 25-pin connector)

PIN 5 Connected to PIN 5 (Ground)
PIN 3 Connected to PIN 2
PIN 2 Connected to PIN 3

Female DB9 (From PC)   Male DB9 (To Switcher)
PIN 4 Connected to PIN 6
PINS 8, 7, 1 Connected together
If a shielded cable is used, connect the shield to PIN 5

PIN 7 Connected to PIN 5 (Ground)
PIN 2 Connected to PIN 2
PIN 3 Connected to PIN 3
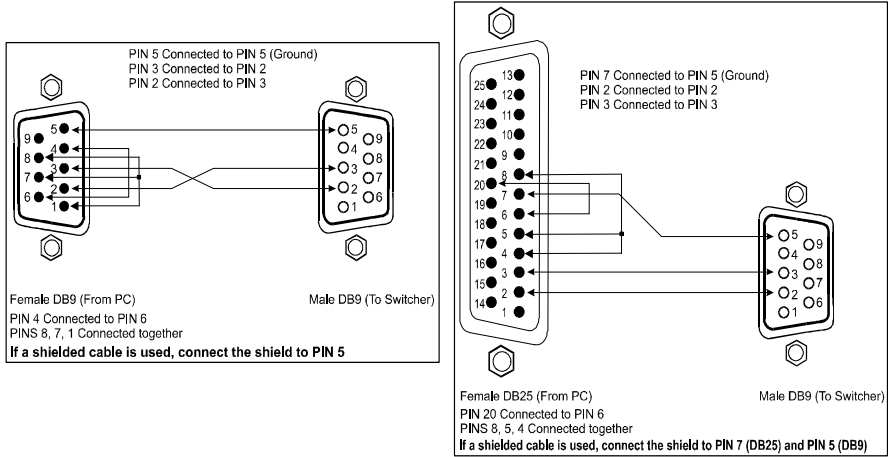
Female DB25 (From PC)   Male DB9 (To Switcher)
PIN 20 Connected to PIN 6
PINS 8, 5, 4 Connected together
If a shielded cable is used, connect the shield to PIN 7 (DB25) and PIN 5 (DB9)

Figure 3: Connecting a PC without using a Null-modem Adapter

5.2 Setting the Dipswitches

Configure the **7508** unit by setting the dipswitches, as Table 2 defines:

Table 2: Setting the Dipswitches

	Dipswitch	Set as follows:							
1	Y/C	ON for Y/C source; OFF for CV source							
2	RESERVED	OFF							
3	PEDESTAL[1]	ON for pedestal (7.5 IRE offset selection for NTSC); OFF for no pedestal							
		AUTO	NTSC	PAL	PAL-M	PAL-N	NTSC-4	SECAM	AUTO
4	STANDARD 1	OFF	ON	OFF	ON	OFF	ON	OFF	ON
5	STANDARD 2	OFF	OFF	ON	ON	OFF	OFF	ON	ON
6	STANDARD 3	OFF	OFF	OFF	OFF	ON	ON	ON	ON
7	RESERVED	OFF							
8	PROGRAM	ON for upgrading firmware; OFF for no upgrading firmware							

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1 NTSC offsets the black level within the active video signal by 7.5 IRE when selected

6 Technical Specifications

Table 3 includes the technical specifications:

Table 3: Technical specifications[1] of the 7508 CV / YC to SDI Converter

INPUTS:	1 composite video: 1Vpp / 75Ω on a BNC connector 1 s-Video: 1Vpp, 0.3Vpp / 75Ω on a 4p connector
OUTPUTS:	2 SDI: SMPTE-259M, ITU-R BT.601 on BNC connectors
BANDWIDTH (-3dB):	0.2dB to 5MHz
DIFF. GAIN:	1%
DIFF. PHASE:	1%
K-FACTOR:	<0.2%
S/N RATIO:	57dB
DIGITAL RESOLUTION:	10 bits
LUMA NON-LINEARITY:	1%
CHROMA/LUMA DELAY:	<15ns
CONTROLS:	Brightness, contrast, hue, saturation, sharpness via RS-232
POWER SOURCE:	12 VDC, 220mA
DIMENSIONS:	12cm x 7.5cm x 2.5cm (4.7" x 0.98" x 2.95"), W, D, H
WEIGHT:	0.3kg. (0.66lbs.)
ACCESSORIES:	Power supply, Null-modem adapter, mounting bracket

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1 Specifications are subject to change without notice

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7   Communication Protocol

RS-232 communication with the **7508** complies with the following protocol. The protocol uses 4 bytes of information, and data is at 9600 baud, with no parity, 8 data bits and 1 stop bit.

Table 4: Structure of the Protocol

MSB							LSB
			INSTRUCTION				
0	TO PC	I5	I4	I3	I2	I1	I0
7	6	5	4	3	2	1	0
1st byte							
			DATA				
1	D6	D5	D4	D3	D2	D1	D0
7	6	5	4	3	2	1	0
2nd byte							
			EXTENDED DATA				
1	E6	E5	E4	E3	E2	E1	E0
7	6	5	4	3	2	1	0
3rd byte							
	MSB's						ADDR
1	E7	D7	0	0	1	1	0
7	6	5	4	3	2	1	0
4th byte[1]							

Note that the MSB's of the DATA (D7) and the EXTENDED DATA (E7) are in the fourth byte.

Terminology:
- TO PC is the "DESTINATION BIT"
- I4..I0 is the "INSTRUCTION"
- D7..D0 is the "DATA"
- E7..E0 is the "EXTENDED DATA"
- A0 is the "LSB of the MACHINE ADDRESS"

The destination bit, TO PC, is 0 when sending from the PC to the machine, or 1 when sending from the machine to the PC.

Table 5: Instruction Set for the 7508

#	INSTRUCTION	I5	I4	I3	I2	I1	I0
0	Reset	0	0	0	0	0	0
1	Read video standard	0	0	0	0	0	1
3	Read back-panel DIP-switch 1 (video format CV/YC)	0	0	0	0	1	1
10	Write EEPROM data – low address	0	0	1	0	1	0
11	Read EEPROM data – low address	0	0	1	0	1	1
12	Write I²C	0	0	1	1	0	0
13	Read I²C	0	0	1	1	0	1
16	Error	0	1	0	0	0	0
57	Enable "Power-down save"	1	1	1	0	0	1
61	Identify machine	1	1	1	1	0	1

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1 Note that the MSB's of the DATA (D7) and the EXTENDED DATA (E7) are in the fourth byte

DESCRIPTION OF INSTRUCTIONS

INSTRUCTION 0 – RESET

DATA=0: initialize the machine.

When the machine is initialized, it will send the RESET code (DATA = 0). If the machine receives this code, it will reset to its "power-up" state.

DATA=1: configure the machine to its factory default state.

When the machine receives this code, all programmable parameters will be reset to their factory-default values.

EXTENDED DATA - set as 0.

INSTRUCTION 1 – READ INPUT STANDARD

For sending to machine, set DATA = EXTENDED DATA = 0.

When replying:- DATA = INPUT STANDARD; EXTENDED DATA = 0. The PC sends this instruction to the machine. The machine replies by sending back the INPUT STANDARD, defined as per the table below:

Table 6: Input Standard

STANDARD	E2	E1	E0
NTSC (J, M)	0	0	0
PAL (B, G, H, I, N)	0	0	1
PAL-M	0	1	0
Combination PAL-N	0	1	1
NTSC 4.43	1	0	0

INSTRUCTION 3 – READ BACK-PANEL DIP-SWITCH 1 (VIDEO FORMAT) (read format)

When sending to machine:- DATA, EXTENDED DATA - set as 0.

When replying:- EXTENDED DATA = back-panel DIP switch 1 (0=CV, 1=Y/C).; DATA = 0. The PC sends this instruction to the machine. The machine replies by sending back a value relating to the current video format.

INSTRUCTION 10 – WRITE EEPROM DATA

DATA = EEPROM sub-address; EXTENDED DATA = data to be written to this sub-address. The PC sends data directly to the EEPROM. The EEPROM stores this new value, and replies by sending the same data back to the PC. CAUTION – this function was designated for development and testing purposes. Improper use of this function may cause erratic behaviour of the machine.

INSTRUCTION 11 – READ EEPROM DATA

For sending to machine, DATA = EEPROM sub-address.

When replying:- DATA = EEPROM sub-address; EXTENDED DATA = requested data.

The PC sends this instruction to the machine. The machine replies by sending back the data of this sub-address.

INSTRUCTION 12 – WRITE I²C

DATA = I²C sub-address; EXTENDED DATA = data to be written to this sub-address.

The PC sends I²C data (to the I²C address which was last accessed via INSTRUCTION 13). The machine replies by sending the same data back to the PC.

CAUTION – this function was designated for development and testing purposes. Improper use of this function may cause erratic behavior of the machine.

INSTRUCTION 13 – READ I²C

For sending to machine, DATA = I²C address; EXTENDED DATA = sub-address.

When replying:- DATA = sub-address; EXTENDED DATA = data read.

The PC sends this instruction to the machine. The machine replies by sending back the data of this address and sub-address.

INSTRUCTION 16 – ERROR

If the machine receives an invalid instruction, it replies by sending this error code.

INSTRUCTION 57 – ENABLE "POWER-DOWN SAVE"

DATA = 0 disables power-down saving; DATA = 1 enables saving. EXTENDED DATA - set to 0.

The PC sends this instruction to the machine. The power-down option is enabled or disabled according to the value of DATA. If the power-down option is enabled, then the machine will "remember" its state before being turned off, and revert to this state when turned on again.

Note that whenever the machine is turned on, the power-down save option is enabled.

INSTRUCTION 61 – IDENTIFY MACHINE

For sending, DATA = 1 to request machine name; DATA = 3 to request software version number. EXTENDED DATA - set to 0.

The PC sends this instruction to the machine. The machine relies as follows:

if the machine name is requested, the machine replies with DATA = 75 (hex), and EXTENDED DATA = 01 (hex).

if the software version is requested, the machine replies with DATA as the version number before the decimal point, and EXTENDED DATA is the value following the decimal point. For example, for version 3.4, the machine replies with DATA = 03 (hex), and EXTENDED DATA = 04 (hex).

LIMITED WARRANTY

Kramer Electronics (hereafter *Kramer*) warrants this product free from defects in material and workmanship under the following terms.

HOW LONG IS THE WARRANTY

Labor and parts are warranted for three years from the date of the first customer purchase.

WHO IS PROTECTED?

Only the first purchase customer may enforce this warranty.

WHAT IS COVERED AND WHAT IS NOT COVERED

Except as below, this warranty covers all defects in material or workmanship in this product. The following are not covered by the warranty:

1. Any product which is not distributed by Kramer, or which is not purchased from an authorized Kramer dealer. If you are uncertain as to whether a dealer is authorized, please contact Kramer at one of the agents listed in the web site www.kramerelectronics.com.
2. Any product, on which the serial number has been defaced, modified or removed.
3. Damage, deterioration or malfunction resulting from:
    i)   Accident, misuse, abuse, neglect, fire, water, lightning or other acts of nature
    ii)   Product modification, or failure to follow instructions supplied with the product
    iii)   Repair or attempted repair by anyone not authorized by Kramer
    iv)   Any shipment of the product (claims must be presented to the carrier)
    v)   Removal or installation of the product
    vi)   Any other cause, which does not relate to a product defect
    vii)   Cartons, equipment enclosures, cables or accessories used in conjunction with the product

WHAT WE WILL PAY FOR AND WHAT WE WILL NOT PAY FOR

We will pay labor and material expenses for covered items. We will not pay for the following:

1. Removal or installations charges.
2. Costs of initial technical adjustments (set-up), including adjustment of user controls or programming. These costs are the responsibility of the Kramer dealer from whom the product was purchased.
3. Shipping charges.

HOW YOU CAN GET WARRANTY SERVICE

1. To obtain service on you product, you must take or ship it prepaid to any authorized Kramer service center.
2. Whenever warranty service is required, the original dated invoice (or a copy) must be presented as proof of warranty coverage, and should be included in any shipment of the product. Please also include in any mailing a contact name, company, address, and a description of the problem(s).
3. For the name of the nearest Kramer authorized service center, consult your authorized dealer.

LIMITATION OF IMPLIED WARRANTIES

All implied warranties, including warranties of merchantability and fitness for a particular purpose, are limited in duration to the length of this warranty.

EXCLUSION OF DAMAGES

The liability of Kramer for any effective products is limited to the repair or replacement of the product at our option. Kramer shall not be liable for:

1. Damage to other property caused by defects in this product, damages based upon inconvenience, loss of use of the product, loss of time, commercial loss; or:
2. Any other damages, whether incidental, consequential or otherwise. Some countries may not allow limitations on how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights, which vary from place to place.

NOTE: All products returned to Kramer for service must have prior approval. This may be obtained from your dealer.

This equipment has been tested to determine compliance with the requirements of:

EN-50081:	"Electromagnetic compatibility (EMC);
	generic emission standard.
	Part 1: Residential, commercial and light industry"
EN-50082:	"Electromagnetic compatibility (EMC) generic immunity standard.
	Part 1: Residential, commercial and light industry environment".
CFR-47:	FCC Rules and Regulations:
	Part 15: "Radio frequency devices
	Subpart B – Unintentional radiators"

CAUTION!

⊠   Servicing the machines can only be done by an authorized Kramer technician. Any user who makes changes or modifications to the unit without the expressed approval of the manufacturer will void user authority to operate the equipment.
⊠   Use the supplied DC power supply to feed power to the machine.
⊠   Please use recommended interconnection cables to connect the machine to other components.

For the latest information on our products and a list of Kramer distributors, visit our Web site: www.kramerelectronics.com. Updates to this user manual may be found at http://www.kramerelectronics.com/manuals.html. We welcome your questions, comments and feedback.