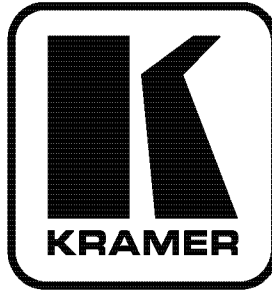


Kramer Electronics, Ltd.



USER MANUAL

Model:

SG-6005x1

Genlock Multistandard SPG / AUDIO Generator

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1 Introduction

Welcome to Kramer Electronics! Since 1981, Kramer Electronics has been providing a world of unique, creative, and affordable solutions to the vast range of problems that confront the video, audio, presentation, and broadcasting professional on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better! Our 500-plus different models now appear in eight groups¹ that are clearly defined by function.

Congratulations on purchasing your Kramer **SG-6005xl** *Genlock Multistandard SPG² / Audio Generator*, which is ideal for:

- Studio master genlock to one stable source
- Black or color bar reference for professional video cameras that need a stable reference
- Use as a test and alignment tool for professional video/audio equipment
- Use as a color bar generator as filler for recording in a duplication studio

Each package includes the following items:

- **SG-6005xl** *Genlock Multistandard SPG / Audio Generator*
- Power cord and Null-modem adapter
- Windows®-based Kramer control software³
- This user manual⁴

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 cables⁵

2.1 Quick Start

This quick start chart summarizes the basic setup and operation steps.

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 Sync Pulse Generator

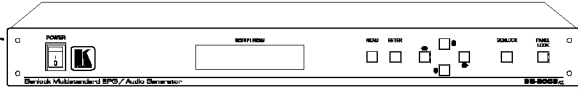
3 Downloadable from our Web site at <http://www.kramerelectronics.com>

4 Download up-to-date Kramer user manuals from our Web site at <http://www.kramerelectronics.com>

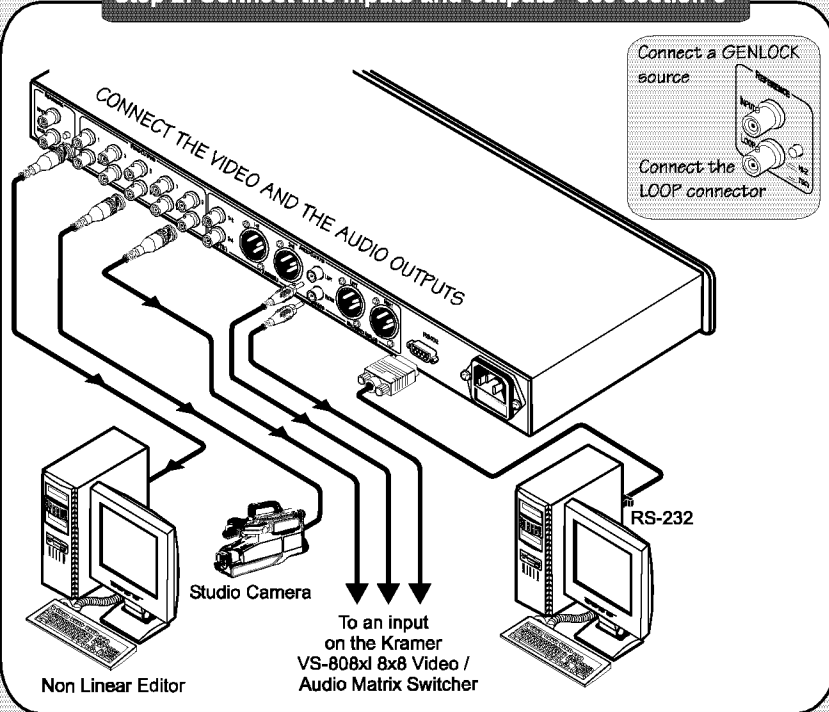
5 The complete list of Kramer cables is on our Web site at <http://www.kramerelectronics.com>

Step 1: Mount the machine

Mount the machine in a rack or stick the 4 rubber feet to the underside

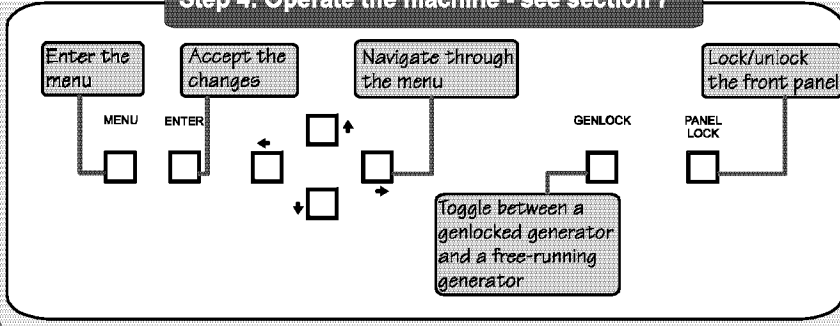


Step 2: Connect the inputs and outputs - see section 6



Step 3: Turn the power ON

Step 4: Operate the machine - see section 7



3 Overview

The **SG-6005xl** is a broadcast quality, multi-standard sync pulse generator (SPG), with black burst, color bar, and audio tone outputs. It has 10 composite video outputs on BNC connectors, each of which can be configured as either a black burst or a color bar signal.

In particular, the **SG-6005xl**:

- Features audio outputs that are available in AES-75 Ω and AES/EBU digital formats, as well as in unbalanced and balanced analog audio formats
- Has balanced and AES/EBU outputs on XLR connectors, while the AES-75 Ω and unbalanced outputs are on BNC connectors. All of the outputs are available simultaneously
- Offers a choice of nine color bars, letting you set timing parameters, SCH and phase
- Lets you adjust the frequency and amplitude for the audio signals
- Can genlock the SPG to an external composite video source via its looping input with selectable termination

The **SG-6005xl** is housed in a 19" 1U rack mountable enclosure, and is fed from a 100-240 VAC universal switching power supply.

The **SG-6005xl** can be controlled via the front panel buttons, with an LCD and a user-friendly menu, and via the RS-232 interface¹.

3.1 Recommendations for Best Performance

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 **SG-6005xl** away from moisture, excessive sunlight and dust

4 Your SG-6005xl Genlock Multistandard SPG / Audio Generator

Figure 1 and Table 1 define the front and rear panels of the **SG-6005xl**.

¹ The Communication Protocol is not available at time of printing. When available, it will be uploaded to our Web site at: <http://www.kramerelectronics.com>

Your SG-6005xl Genlock Multistandard SPG / Audio Generator

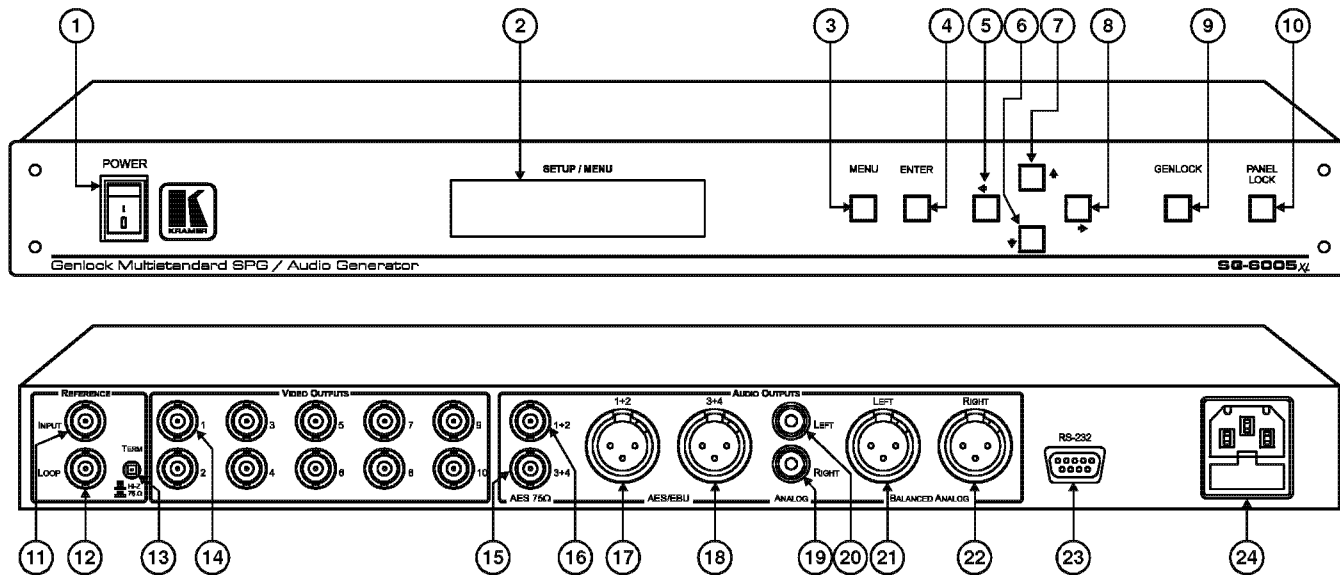


Figure 1: SG-6005xl Genlock Multistandard SPG / Audio Generator

Table 1: SG-6005xl Genlock Multistandard SPG / Audio Generator Features

#	Feature		Function	
1	POWER Switch		Illuminated switch for turning the unit ON or OFF	
2	SETUP / MENU LCD Display		Displays user interface messages and configuration menu items	
3	MENU Button		Press to open the menu (see section 7.1)	
4	ENTER Button		Press to load and save a set up, and enter the submenus	
5	◀ Button		Press to decrease numerical values or select from several definitions	
6	↓ Button		Press to move down the menu list	
7	↑ Button		Press to move up the menu list values	
8	▶ Button		Press to increase numerical values or select from several definitions	
9	GENLOCK Button		Press to toggle between a genlocked generator and a free-running generator ¹ When illuminated, the machine will “genlock” to a valid reference input. When not illuminated, the timing of the generator is internally generated (free-running)	
10	PANEL LOCK Button		Press and hold ² to lock/unlock the front panel buttons	
11	REFERENCE	INPUT BNC Connector	Connect a reference input for genlocking the machine	
12		LOOP BNC Connector	Connect to an additional machine to loop the genlocking source	
13		TERM Button	When looping, release the TERM button When not looping, terminate the line by pressing the button	
14	VIDEO OUTPUT BNC Connectors		Connect to a video acceptor (from 1 to 10)	
15	AUDIO OUTPUTS	AES 75Ω BNC Connectors	3+4	Connect to a digital audio acceptor (for channels 3 and 4) ³
16			1+2	Connect to a digital audio acceptor (for channels 1 and 2) ³
17		AES/EBU XLR Connectors	1+2	Connect to a digital audio acceptor (for channels 1 and 2) ³
18			3+4	Connect to a digital audio acceptor (for channels 3 and 4) ³
19		ANALOG RCA Connectors	RIGHT	Connect to an analog audio acceptor
20			LEFT	
21	BALANCED ANALOG XLR Connectors	LEFT	Connect to a balanced analog audio acceptor	
22		RIGHT		
23	RS-232 9-pin D-sub Port		Connects to the PC or the Remote Controller ⁴	
24	Power Connector with Fuse		AC connector enabling power supply to the unit	

1 If a reference input is not connected, the GENLOCK button blinks when pressed

2 For about 2 seconds

3 In accordance with the standard, the audio digital stream contains two audio channels

4 Via a null-modem connection

5 Installing the SG-6005xl in a Rack

This section describes what to do before installing in a rack and how to rack mount.

Before Installing in a Rack

Before installing in a rack, be sure that the environment is within the recommended range:	
Operating temperature range	+5° to +45° C (41° to 113° F)
Operating humidity range	10 to 90% RHL, non-condensing
Storage temperature range	-20° to +70° C (-4° to 158° F)
Storage humidity range	5 to 95% RHL, non-condensing



CAUTION!!

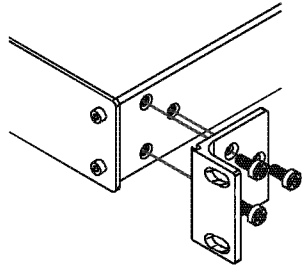
When installing in a 19" rack, avoid hazards by taking care that:

1. It is located within the recommended environmental conditions, as the operating ambient temperature of a closed or multi unit rack assembly may exceed the room ambient temperature.
2. Once rack mounted, enough air will still flow around the machine.
3. The machine is placed straight in the correct horizontal position.
4. You do not overload the circuit(s). When connecting the machine to the supply circuit, overloading the circuits might have a detrimental effect on overcurrent protection and supply wiring. Refer to the appropriate nameplate ratings for information. For example, for fuse replacement, see the value printed on the product label.
5. The machine is earthed (grounded) in a reliable way and is connected only to an electricity socket with grounding. Pay particular attention to situations where electricity is supplied indirectly (when the power cord is not plugged directly into the socket in the wall), for example, when using an extension cable or a power strip, and that you use only the power cord that is supplied with the machine.

How to Rack Mount

To rack-mount a machine:

1. Attach both ear brackets to the machine. To do so, remove the screws from each side of the machine (3 on each side), and replace those screws through the ear brackets.



2. Place the ears of the machine against the rack rails, and insert the proper screws (not provided) through each of the four holes in the rack ears.

Note that:

- In some models, the front panel may feature built-in rack ears
- Detachable rack ears can be removed for desktop use
- Always mount the machine in the rack before you attach any cables or connect the machine to the power
- If you are using a Kramer rack adapter kit (for a machine that is not 19"), see the Rack Adapters user manual for installation instructions (you can download it at: <http://www.kramerelectronics.com>)

6 Connecting an SG-6005xl Genlock Multistandard SPG / Audio Generator

To connect the **SG-6005xl Genlock Multistandard SPG / Audio Generator**, as illustrated in the example in Figure 2, do the following¹:

1. Connect the VIDEO OUTPUT BNC connectors to up to 10 composite video acceptors², for example:
 - OUTPUT 1 to a non linear editor
 - OUTPUT 6 to a studio camera
 - OUTPUT 10 to an input on the Kramer **VS-808xl 8x8 Video / Audio Matrix Switcher**
2. Connect the AUDIO OUTPUTS as follows:
 - The LEFT and RIGHT ANALOG RCA connectors to an analog stereo audio acceptor (for example, the audio input on the Kramer **VS-808xl 8x8 Video / Audio Matrix Switcher**)
 - The AES 75Ω BNC connectors (for channels 1+2 and 3+4) to a digital stereo audio acceptor³
 - The AES/ABU XLR connectors (for channels 1+2 and 3+4) to a digital audio acceptor³
 - The LEFT and RIGHT BALANCED ANALOG XLR connectors to an analog balanced stereo audio acceptor³
3. If required³, connect:
 - A Genlock source to the INPUT BNC connector⁴
 - The LOOP BNC connector to the INPUT BNC connector of the next unit in the line, and release the TERM button for looping⁵
4. If required, connect a PC and/or controller to the RS-232 port (see section 7).
5. Connect the power connector to the mains electricity³.

1 Switch OFF the power on each device before connecting it to your SG-6005xl. After connecting your SG-6005xl, switch on its power and then switch on the power on each device

2 You do not have to connect all the outputs

3 Not illustrated in Figure 2

4 Press the GENLOCK button to toggle between a genlocked generator and a free-running generator

5 Pushed in terminates the input. Release when the input extends to another unit

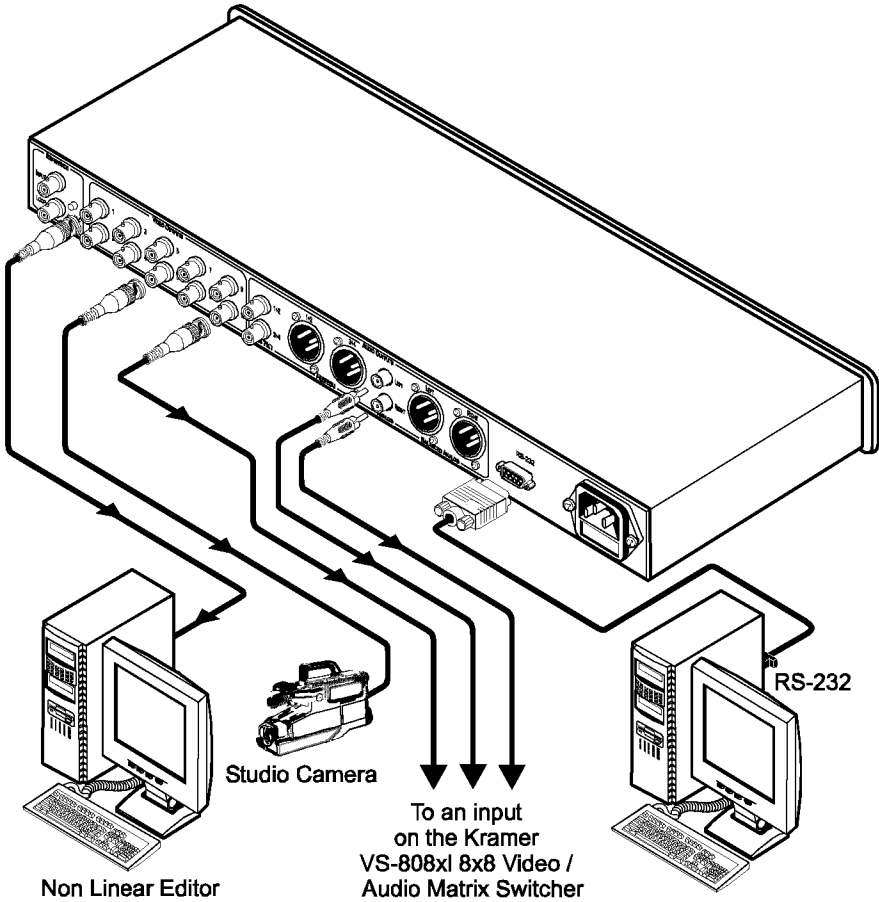


Figure 2: Connecting a SG-6005xl Genlock Multistandard SPG / Audio Generator

7 Using the SG-6005xl Genlock Multistandard SPG / Audio Generator

This section describes how to:

- Operate the **SG-6005xl**, see section 7.1
- Use front PANEL LOCK button, see section 7.2

7.1 Operating the SG-6005xl Genlock Multistandard SPG / Audio Generator

The **SG-6005xl** can save and load up to 16 setups via the menu.

To use the menu, press the:

- MENU button to start the menu
- ENTER button to accept changes
- **↑** and **↓** buttons to scroll through the menu and sub-menus
- **➡** and **⬅** to increase or decrease numerical values or select from several definitions of a setup

Upon exiting the menu, the SAVE SETTING AS item appears.

Table 2 defines the menu items.

Table 2: The SG-6005xl Menu Items

#	Menu Item	Submenu	Default Value
1	LOAD SETUP NUMBER ...	1 to 16 (press ENTER to load)	
2	SAVE SETTING AS SETTING NUMBER ...	1 to 16 (press ENTER to save)	
3	SET UP ... FACTORY RESET	Press ENTER to reset	
4	SET VIDEO SIGNAL (enter submenu)		
	↑ ↓ TEST SIGNAL	↔ COLOR BARS 75%	COLOR BARS 75%
		↔ SPLIT BARS 75%	
		↔ HORIZONTAL BARS 75%	
		↔ INVERS HDR. BARS 75%	
		↔ MULTIBURST 5.8	
		↔ PULSE 2T AND BAR	
		↔ VITS 330	
		↔ TEST PATTERN 1	
	↔ TEST PATTERN 2		
	↑ ↓ SET STANDARD	↔ 525i NTSC 3.58	625i PAL 4.43
		↔ 625i PAL 4.43	
5	SET (enter submenu)		
	↑ ↓ VIDEO OUTPUT CH 1 to CH 10	↔ BLACK BURST	BLACK BURST
		↔ TEST SIGNAL	

Using the SG-6005xl Genlock Multistandard SPG / Audio Generator

#	Menu Item	Submenu	Default Value
6	SET ... AUDIO TUNING (enter submenu)		
	↕ CHANNEL L (1,3) ¹ Frequency	↔ 10Hz – 20000Hz (in 10Hz steps) ²	1000Hz
	↕ CHANNEL R (2,4) ³ Frequency	↔ 10Hz – 20000Hz (in 10Hz steps) ²	1000Hz
	↕ ANALOG LEFT LEVEL ⁴	↔ -19dBu (-25dBu) to +12dBu (+6dBu)	-19dBu (-25dBu)
	↕ ANALOG LEFT CHANNEL	↔ SILENT, ACTIVE	SILENT
	↕ ANALOG RIGHT LEVEL	↔ -19dBu (-25dBu) to +12dBu (+6dBu)	-19dBu (-25dBu)
	↕ ANALOG RIGHT CHANNEL	↔ SILENT, ACTIVE	SILENT
	↕ DIGITAL 1 (L) LEVEL ⁵	↔ -31dBFS to 0dBFS	-31dBFS
	↕ DIGITAL 1 (L) CHANNEL ⁵	↔ SILENT, ACTIVE	SILENT
	↕ DIGITAL 2 (R) LEVEL ⁶	↔ -31dBFS to 0dBFS	-31dBFS
	↕ DIGITAL 2 (R) CHANNEL ⁶	↔ SILENT, ACTIVE	SILENT
	↕ DIGITAL 3 (L) LEVEL ⁵	↔ -31dBFS to 0dBFS	-31dBFS
	↕ DIGITAL 3 (L) CHANNEL ⁵	↔ SILENT, ACTIVE	SILENT
	↕ DIGITAL 4 (R) LEVEL ⁶	↔ -31dBFS to 0dBFS	-31dBFS
	↕ DIGITAL 4 (R) CHANNEL ⁶	↔ SILENT, ACTIVE	SILENT
	↕ CLICK IN LEFT CHANNELS ⁷	↔ DISABLE, 1 SEC to 4 SEC	DISABLE
7	SET ... GENLOCK (enter submenu)		
	↕ FACTORY RESET	Press ENTER to reset the GENLOCK parameters	
	↕ GENLOCK MODE	↔ HV only, HV and SC	HV only
	↕ GENLOCK TIMING HORIZONTAL	↔ from -31968ns to +31968ns (in 37ns steps) ²	0
	↕ GENLOCK TIMING VERTICAL	↔ from -625 line to +625 line	0
	↕ GENLOCK EXTRA V SHIFT	↔ -1 frame, 0 frame, +1 frame	0 frame
	↕ GENLOCK SC PHASE SHIFT	↔ from -185° to +185°	0
	↕ NON-GENLOCK or HVmode SCHphase	↔ from -64° to +63°	0
8	TEST 1 PROGRAMMING	↔ TEST 2 PROGRAMMING	
9	ADDRESS OF machine	↔ First, Second	First

1 (1, 3) refer to the ANALOG LEFT, and to the BALANCED ANALOG LEFT signals, respectively

2 To speed up the increase or decrease rate of the values, press the \blacktriangleright or \blacktriangleleft buttons simultaneously with the ENTER button

3 (2, 4) refer to the ANALOG RIGHT, and to the BALANCED ANALOG RIGHT signals, respectively

4 The values without parentheses refer to the BALANCED ANALOG signals, the values in parentheses refer to the ANALOG signals

5 Refers to the left channel of the digital signal

6 Refers to the right channel of the digital signal

7 Insert a pulse signal and select the pulse rate

7.2 Locking the Front Panel

To prevent changing the settings accidentally or tampering with the unit via the front panel buttons, lock your **SG-6005xl**. Unlocking releases the protection mechanism.

To lock the **SG-6005xl**:

- Press the LOCK button for more than three seconds, until the LOCK button is illuminated
The front panel is locked. Pressing a button will have no effect other than causing the LOCK button to blink¹

To unlock the **SG-6005xl**:

- Press the illuminated LOCK button for more than three seconds, until the LOCK button is no longer illuminated
The front panel unlocks

7.3 Controlling via RS-232 (for example, using a PC)

To connect a PC to the **SG-6005xl** unit, using the Null-modem adapter provided with the machine (recommended):

- Connect the RS-232 9-pin D-sub rear panel port on the **SG-6005xl** unit to the Null-modem adapter and connect the Null-modem adapter with a 9-wire flat cable to the RS-232 9-pin D-sub port on your PC

To connect a PC to the **SG-6005xl** unit, without using a Null-modem adapter:

- Connect the RS-232 9-pin D-sub port on your PC to the RS-232 9-pin D-sub rear panel port on the Master **SG-6005xl** unit, as Figure 3 illustrates

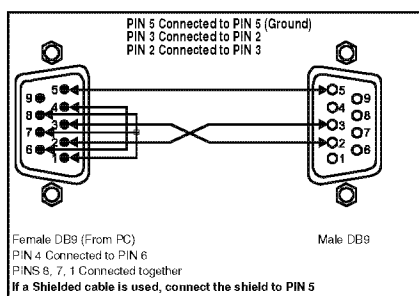


Figure 3: Connecting a PC without using a Null-modem Adapter

¹ Warning that you need to unlock to regain control via the front panel

8 Technical Specifications

Table 3 includes the technical specifications:

Table 3: Technical Specifications¹ of the SG-6005xl

INPUTS:	1 REF (genlock), looping on BNC connectors, 1Vpp/75Ω, on BNC connectors with a termination switch	
OUTPUTS:	10 composite video on BNC connectors, individually configurable: black burst 0.3Vpp/75Ω (sync) or 1Vpp/75Ω max (color bar); 1 stereo balanced audio on 2 XLR connectors, 12dBu max; 1 unbalanced stereo analog audio on 2 RCA connectors, 6dBu max; 2 AES/EBU digital audio on XLR connectors, 0dBFS max; 2 AES3-ID digital audio on BNC connectors, 0dBFS max	
VIDEO STANDARDS:	PAL, NTSC	
COLOR BAR:	8 selectable patterns	
STABILITY:	1ppm	
S/N RATIO:	VIDEO: >73dB (black burst)	AUDIO: >89dB
DIGITIZATION:	VIDEO: 10 bits, 27MHz	AUDIO: 20 bits, 48kHz
CONTROLS:	VIDEO: black burst or test signal configuration AUDIO: frequency out: 10Hz to 20kHz; audio analog range: 31dBu; audio digital range: 31dBFS; each channel may be set to silent; Control via front panel (OSD) and RS-232; Buttons for genlock, panel lock, input termination	
POWER SOURCE:	100-240VAC, 50/60Hz, 10VA	
DIMENSIONS:	19 inch (W), 7 inch (D), 1U (H) rack mountable	
WEIGHT:	2.5kg (5.5lbs) approx.	

¹ Specifications are subject to change without notice

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 seven 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, or on which the WARRANTY VOID IF TAMPERED sticker has been torn, reattached, removed or otherwise interfered with.
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, where updates to this user manual may be found. We welcome your questions, comments and feedback.

 <p>Caution</p>	<p>Safety Warning: Disconnect the unit from the power supply before opening/servicing.</p>
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Kramer Electronics, Ltd.
Web site: www.kramerelectronics.com
E-mail: info@kramerelectronics.com
P/N: 2900-000322 REV 1