KRAMER ELECTRONICS LTD.

USER MANUAL

MODEL:

SP-1G
3G HD-SDI Synchronizer

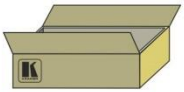
P/N: 2900-000766 Rev 4

SP-1G Quick Start Guide

This guide helps you install and use your product for the first time. For more detailed information, go to http://www.kramerelectronics.com/support/product_downloads.asp to download the latest manual or scan the QR code on the left.

Step 1: Check the contents of the box

- **SP-1G** 3G HD-SDI Synchronizer
- 1 Power supply (5V DC)
- 1 Quick Start sheet
- 4 Rubber feet



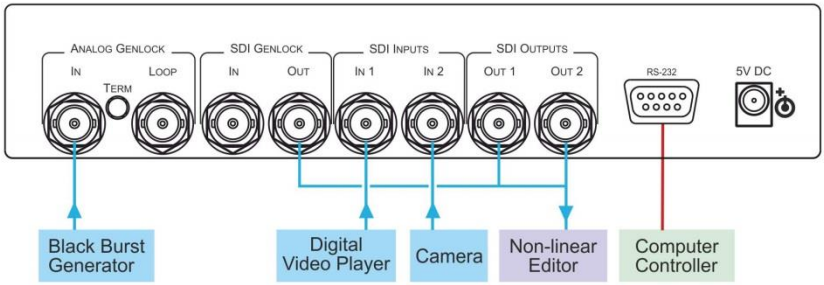
Save the original box and packaging in case your **SP-1G** needs to be returned to the factory for service.

Step 2: Install the SP-1G

Attach the rubber feet and place on a table or mount the device in a rack (using an optional **RK-1** rack mount).

Step 3: Connect the inputs and outputs

Always switch off the power to each device before connecting it to your **SP-1G**.



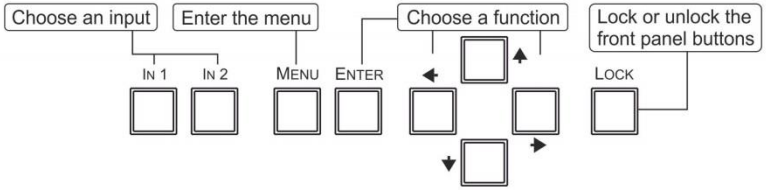
Always use Kramer high-performance cables for connecting AV equipment to the **SP-1G.**

Step 4: Connect the power

Connect the 5V DC power adapter to the **SP-1G** and plug the adapter into the mains electricity.



Step 5: Operate the SP-1G



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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 1,000-plus different models now appear in 11 groups that are clearly defined by function: GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Routers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Range Extenders and Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Scalers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Accessories and Rack Adapters; and GROUP 11: Sierra Products.

Congratulations on purchasing your Kramer **SP-1G** *3G HD-SDI Synchronizer* which is ideal for the following typical applications:

- Broadcasting studios
- Post-production

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



Go to http://www.kramerelectronics.com/support/product_downloads.asp to check for up-to-date user manuals, application programs, and to check if firmware upgrades are available (where appropriate).

2.1 Achieving the Best Performance

To achieve the best performance:

- Use only good quality connection cables (we recommend Kramer high-performance, high-resolution cables) to avoid interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables)
- Do not secure the cables in tight bundles or roll the slack into tight coils
- Avoid interference from neighboring electrical appliances that may adversely influence signal quality
- Position your Kramer **SP-1G** away from moisture, excessive sunlight and dust



This equipment is to be used only inside a building. It may only be connected to other equipment that is installed inside a building.

2.2 Safety Instructions



Caution: There are no operator serviceable parts inside the unit

Warning: Use only the Kramer Electronics input power wall adapter that is provided with the unit

Warning: Disconnect the power and unplug the unit from the wall before installing

2.3 Recycling Kramer Products

The Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC aims to reduce the amount of WEEE sent for disposal to landfill or incineration by requiring it to be collected and recycled. To comply with the WEEE Directive, Kramer Electronics has made arrangements with the European Advanced Recycling Network (EARN) and will cover any costs of treatment, recycling and recovery of waste Kramer Electronics branded equipment on arrival at the EARN facility. For details of Kramer's recycling arrangements in your particular country go to our recycling pages at *http://www.kramerelectronics.com/support/recycling/*.

3 Overview

The **SP-1G** *3G HD-SDI Synchronizer* is a synchronizer for digital video signals up to 3G HD-SDI. The device converts any SDI input standard to any SDI output standard, scales the image, and synchronizes a video channel from the dedicated genlock input - either an SDI input or an analog reference source.

Input and output video standards (SMPTE-292M, SMPTE-259M and SMPTE-424M compliant): 480i/60, 576i/50, 720p/50, 720p/59.95, 720p/60, 1080i/50, 1080i/59.97, 1080i/60, 1080p/23.97, 1080p/24, 1080p/25, 1080p/29.97, 1080p/30, 1080p/50, 1080p/59.97, 1080p/60, 1080psf/23.97, 1080psf/24, 1080psf/25, 1080psf/29.97 and 1080psf/30.

The unit contains a special audio synchronizer that de-embeds all input audio channels, resamples them simultaneously, and embeds the resulting audio signals in the SDI output. This corrects signal deterioration such as a frame drop or repetition that may occur during video signal synchronization.

The SDI video signal that is applied to the genlock SDI input can also be used (without external connections) as a third video input. Thus the **SP-1G**, besides its synchronizing function, can implement Clean Switching (glitch-free) video and Soft Switching audio between three separate non-synchronous SDI inputs even if the standards of these signals differ.

More specifically, the **SP-1G** features:

- Cross standard conversion
- Image scaling
- Two SDI inputs and outputs
- One dedicated SDI genlock input and one analog genlock input with LOOP output
- Clean Switching video (glitch-free switching) and Soft Switching audio functions
- Automatic standard detection

- TBC operation with continuous, uninterrupted syncs on the output, even when there is an input glitch
- An audio embedder/de-embedder that handles 16 audio channels simultaneously
- A built-in test signal generator that provides special video test signals as well as a 1kHz (–18dBFS) audio sine wave for all 16 SDI audio channels (all 4 groups simultaneously)
- A two-line, 16-character per line LCD display that shows the status of the device while in the main mode of operation
- Nine front panel buttons to control operation of the device
- One RS-232 port for controlling the **SP-1G** from a serial remote control device or a PC

3.1 Defining the SP-1G 3G HD-SDI Synchronizer

Figure 1 defines the **SP-1G**.

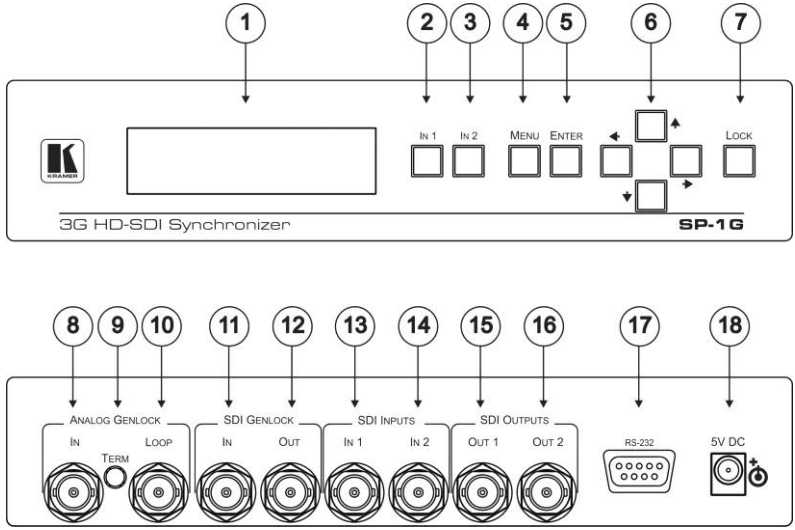


Figure 1: SP-1G 3G HD-SDI Synchronizer

#	Feature		Function
1	Display Panel		2-line, 32-character LCD display
2	*IN 1* Button		Press to select the signal on Input 1, lights when IN1 has an appropriate video signal, flashes about 1 time per sec if an input signal is absent
3	*IN 2* Button		Press to select the signal on Input 2, lights when IN2 has an appropriate video signal, flashes about 1 time per sec if an input signal is absent
4	*MENU Button*		1. Opens the top level MENU from the MAIN mode of operation. 2. Closes top the level MENU and returns to the MAIN mode of operation. 3. Closes a SUBMENU and returns to the top level MENU.
5	*ENTER* Button		1. Fixes a new value of the adjusted parameter (but doesn't save it). 2. Opens a SUBMENU from the top level MENU item. 3. Accelerates the repeat function 16 times, when this button is pressed together with LEFT or RIGHT buttons.
6	◄ Left Arrow Button		Selects the previous value of a selected parameter (with repeat function)
	▼ Down Arrow Button		Selects the next item of any menu
	▲ Up Arrow Button		Selects the previous item of any menu. Optionally this button can select an SDI genlock input as video input besides IN1 and IN2. This function can be turned ON in the last item of the "SDI GenlockIN as Video: Enable or Disable" menu, (See Section 6.12)
	► Right Arrow Button		Selects the next value of selected parameter (with repeat function)
7	*LOCK* Button		Press for 2 seconds to enable or disable the panel LOCK function
8	*Analog Genlock*	*IN* BNC Connector	Connects to analog genlock reference source, auto standard identification is available
9		*TERM* Pushbutton	Press if no additional device is attached, release if another device is attached
10		*LOOP* BNC Connector	Connects the analog genlock signal to another device
11	*SDI Genlock*	*IN* BNC Connector	Connects to an SDI genlock reference source. It can also be used as third video input, (see Section 6.12). Auto standard identification is available
12		*OUT* BNC Connector	Connects to an SDI genlock acceptor
13	*SDI Inputs*	*IN 1* BNC Connector	Connects to SDI source 1
14		*IN 2* BNC Connector	Connects to SDI source 2
15	*SDI Outputs*	*OUT 1* BNC Connector	Connects to SDI acceptor 1
16		*OUT 2* BNC Connector	Connects to SDI acceptor 2
17	*RS-232* 9-pin D-sub Port		Connects to a PC or the remote controller
18	*5V DC* Power Connector		Connect to the supplied 5V DC power adapter

4 Connecting the SP-1G 3G HD-SDI Synchronizer

To connect the **SP-1G** as shown in the example in Figure 2:

1. Connect up to two SDI input sources (for example, a video camera and SDI VTR) to the IN 1 or IN 2 BNC connectors.

2. Connect the OUT 1 and OUT 2 BNC connectors to up to 2 SDI output acceptors (for example, a non-linear editor).

3. To get the genlock function, connect an analog genlock reference source to the ANALOG GENLOCK IN BNC connector or an SDI genlock reference source to the SDI GENLOCK IN BNC connector.

4. If required, connect a controlling computer to the RS-232 9-pin D-sub connector (see Section 4.1).

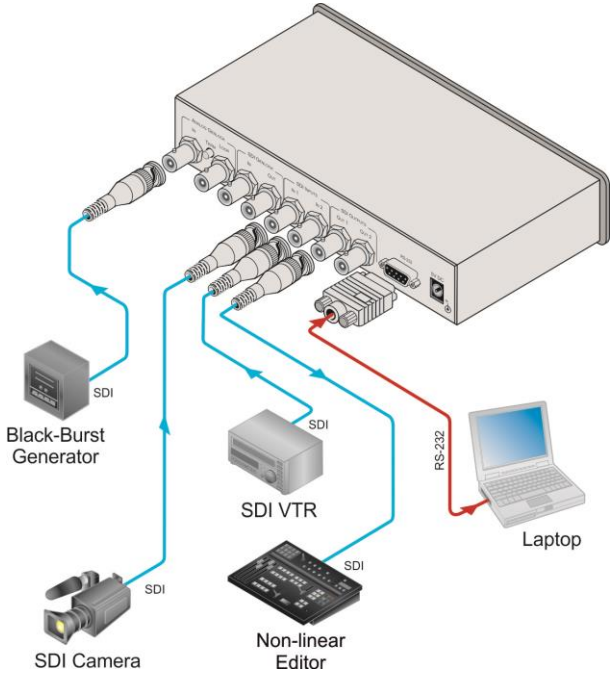


Figure 2: Connecting the SP-1G 3G HD-SDI Synchronizer

The **SP-1G** can be used as a clean switch as shown in the application in Figure 3.

To connect an 8x1 clean switch:

1. Connect the SDI OUTPUT of a switcher (for example, a **VS-81HDxl**) to the SDI INPUT of the **SP-1G**.

2. Connect the SDI OUTPUT of the **SP-1G** to an SDI acceptor (for example, a non-linear editor).

3. Configure the internal genlock of the **SP-1G** to INPUT 1 (see Section 6.6.3).

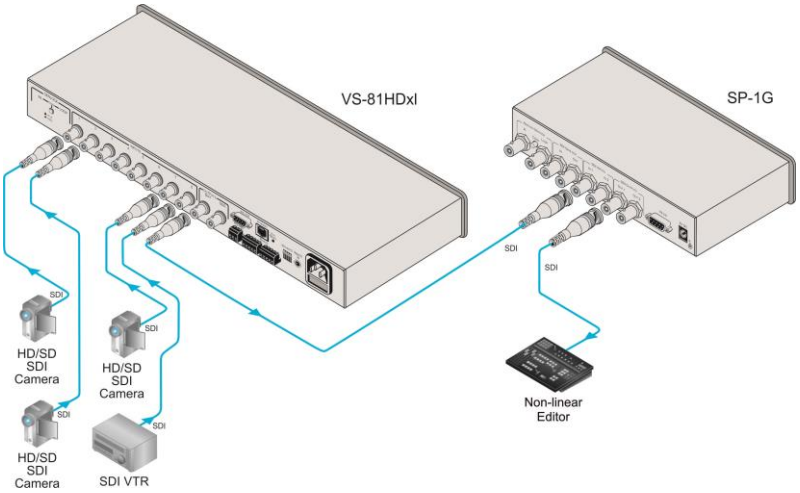


Figure 3: Connecting the SP-1G as a Clean Switch

4.1 Connecting the SP-1G via RS-232

You can connect to the **SP-1G** via an RS-232 connection using, for example, a PC. Note that a null-modem adapter/connection is not required.

To connect to the **SP-1G** via RS-232:

- Connect the RS-232 9-pin D-sub rear panel port on the **SP-1G** via a 9-wire straight cable (only pin 2 to pin 2, pin 3 to pin 3, and pin 5 to pin 5 need to be connected) to the RS-232 9-pin D-sub port on your PC

5 Operating the SP-1G

This section explains how to use the:

- LCD display (see Section 5.1)
- Front panel buttons (see Section 5.2)

5.1 Using the LCD Display

The **SP-1G** includes a two-line, 16-character per line LCD display that displays (while in the main mode of operation) the device status, the genlock reference source and standard of video signals on SDI outputs. The following examples explain what is shown on the display.

1. When the genlock mode is turned OFF, the display shows:

   SET3 INT.XTAL REF.
   FrcSTD: 1080p/60

   This means the setup (preset) number is 3; the internal crystal generator XTAL is used as the genlock reference source, the standard of output signals on outputs is forced to 1080p/60.

2. If the genlock is turned ON and a reference input signal was selected as dedicated input SDI GenlockIN, the display shows:

   SET3 Ref: GnlSDI
   FrcSTD: 1080p/60

3. If the output standard selection mode is AUTO, the display shows:

   SET3 Ref: GnlSDI
   AutSTD: 1080p/60

4. If genlock is turned ON and Analog Genlock Input was selected as the reference input signal, the display shows:

   SET3 Ref: GnlAnl
   AutSTD: 1080p/60

5.2 Using the Front Panel Buttons

The front panel includes the following buttons:

IN1, IN2, **MENU, ENTER, ►,▲,▼,◄**. Pressing any arrow button once advances or returns one parameter. Pressing and holding an arrow button scrolls automatically through the menus or parameters. The following table explains their functions.

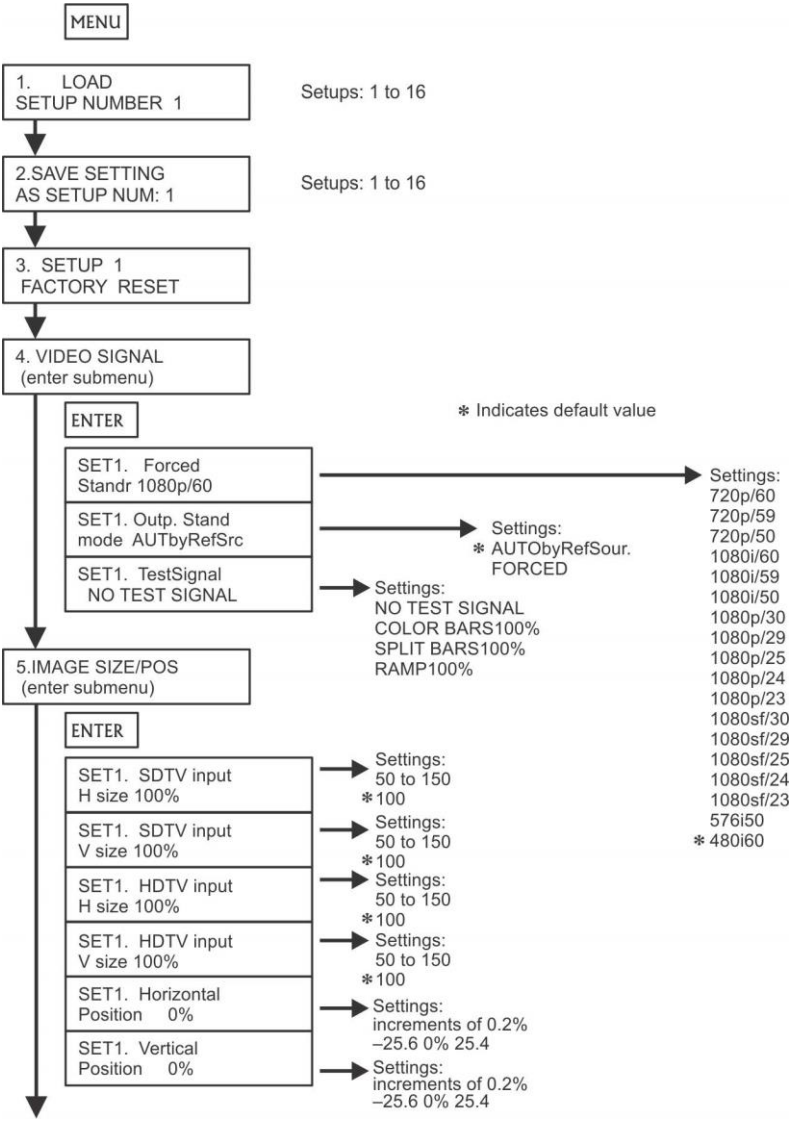
Button	Function
IN 1	Selects SDI INPUT 1
IN 2	Select SDI INPUT 2
MENU	1. Opens the top level MENU from the MAIN mode of operation. 2. Closes the top level MENU and returns to the MAIN mode of operation. 3. Closes the SUBMENU and returns to the top level MENU.
ENTER	1. Fixes a new value of the adjusted parameter (but does not save it). 2. Opens a SUBMENU from the top level MENU. 3. Accelerates the repeat function 16 times, if this button is pressed together with LEFT or RIGHT buttons.
UP ▲	Selects the previous item of any menu. Optionally this button can be used for additional selecting of SDI genlock input as video input besides IN1 and IN2. This optional function can be turned ON in special item (last item) of top menu: “SDI Genl Input as Video: Enable or Disable”, (see Section 6.12)
DOWN ▼	Selects the next item of any menu
LEFT◄	Selects the previous value of a selected parameter (with repeat function)
RIGHT ►	Selects the next value of a selected parameter (with repeat function)
PANEL LOCK	Enables or disables the PANEL LOCK function after pressing for 2 sec

6 Using the SP-1G Menus

This section explains how to operate the **SP-1G** using the various menus and their functions.

The menu map in Figure 4 illustrates how to navigate through the various menus and their settings.

Note: All menus below show **SET1.** as an example. Your setup numbers may differ.


MENU
1. LOAD
SETUP NUMBER 1
Setups: 1 to 16
2.SAVE SETTING
AS SETUP NUM: 1
Setups: 1 to 16
3. SETUP 1
FACTORY RESET
4. VIDEO SIGNAL
(enter submenu)
ENTER
∗ Indicates default value
SET1. Forced
Standr 1080p/60
Settings:
720p/60
720p/59
720p/50
1080i/60
1080i/59
1080i/50
1080p/30
1080p/29
1080p/25
1080p/24
1080p/23
1080sf/30
1080sf/29
1080sf/25
1080sf/24
1080sf/23
576i50
∗ 480i60
SET1. Outp. Stand
mode AUTbyRefSrc
Settings:
∗ AUTObyRefSour.
FORCED
SET1. TestSignal
NO TEST SIGNAL
Settings:
NO TEST SIGNAL
COLOR BARS100%
SPLIT BARS100%
RAMP100%
5.IMAGE SIZE/POS
(enter submenu)
ENTER
SET1. SDTV input
H size 100%
Settings:
50 to 150
∗100
SET1. SDTV input
V size 100%
Settings:
50 to 150
∗100
SET1. HDTV input
H size 100%
Settings:
50 to 150
∗100
SET1. HDTV input
V size 100%
Settings:
50 to 150
∗100
SET1. Horizontal
Position 0%
Settings:
increments of 0.2%
–25.6 0% 25.4
SET1. Vertical
Position 0%
Settings:
increments of 0.2%
–25.6 0% 25.4

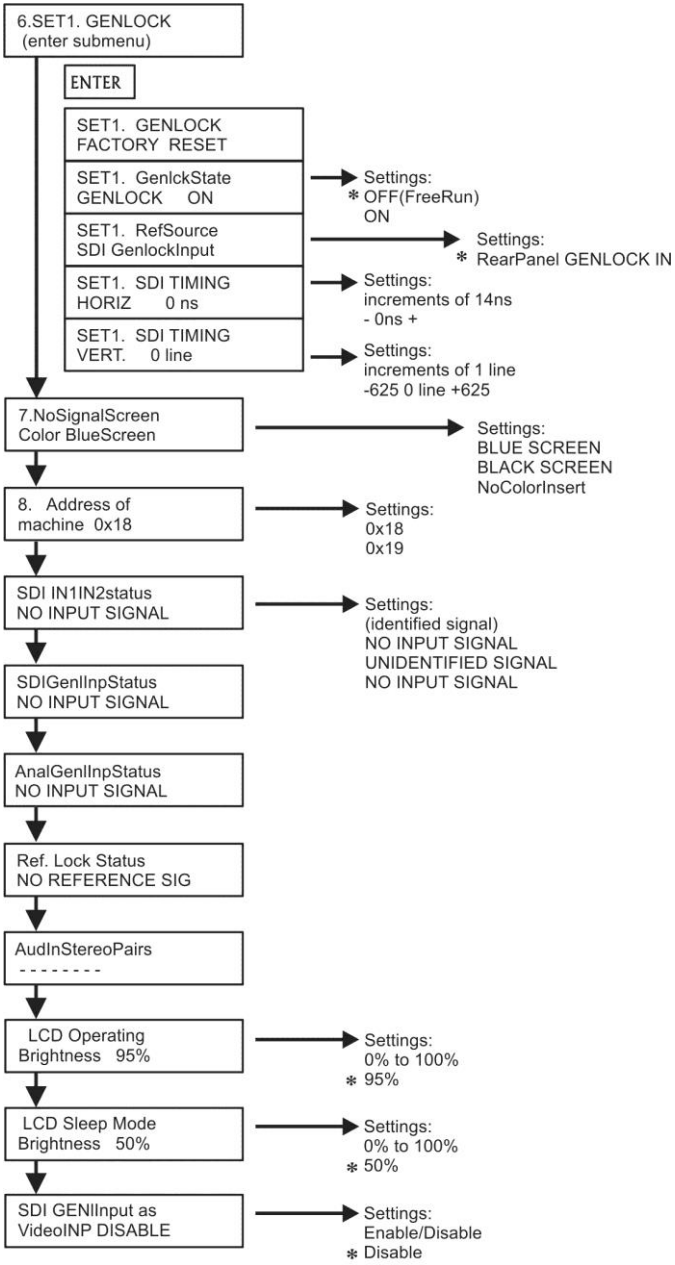


Figure 4: SP-1G Menu Map

6.1 Loading Setups

To load a saved setup:

- Press MENU to enter the menu mode
- Press ▼ or ▲ as needed until **LOAD SETUP NUMBER** is displayed
- Press ◄ or ► to reach the setup number desired (from 1 to 16)
- Press ENTER to load the setup
- Press MENU to return to the normal operating mode

6.2 Saving Setups

A setup is a snapshot of all device settings at a given instant. There are 16 setups are available for saving and reloading.

Note: Most parameter changes are temporarily saved in memory only until the **SP-1G** is powered OFF. To permanently save the change, perform **SAVE SETTING AS A SETUP NUMBER** as shown in this procedure.

To save a setup:

- Press MENU to enter the menu mode
- Press ▼ or ▲ until **SAVE SETTING AS SETUP NUMBER** is displayed
- Press ◄ or ► to reach the setup number desired (from **1** to **16**)
  If the present setup is different from the saved setup, **SETUP NUMBER:** appears (with a colon)
- Press ENTER to save the setup (the colon disappears)
- Press MENU to return to the normal operating mode

6.3 Using the Factory Reset

Use Factory Reset to return any individual setup to its original factory setting.

To perform a factory reset:

- Press MENU to enter the menu mode
- Press ▼ or ▲ until **SETUP 1 FACTORY RESET** is displayed

- Press ◄ or ► to reach the setup number desired (from **1** to **16**)
- Press ENTER to reset the setup
- Save the new setup using the procedure Saving Setups in Section 6.2
- Press MENU to return to the normal operating mode

6.4 Setting the Video Signal

Use this menu to choose between forced or auto standard identification for input and output signals, also to select and turn ON embedded video test signals for each channel separately.

To set the video signal:

- Press MENU to enter the menu mode
- Press ▼ or ▲ until **VIDEO SIGNAL** (enter submenu) is displayed
- Press ENTER go into the submenu
- Press ▼ and ▲ to navigate through the submenus

6.4.1 Setting a Standard

To set a forced standard:

- Press ▼ or ▲ until **SET1. Forced Standr** is displayed
- Press ◄ or ► to reach the desired settings (available settings are shown in the following table)

Standard Resolutions				
480i/60	1080i/50	1080p/25	1080p/60	1080sf/30
576i/50	1080i/59	1080p/29	1080sf/23	
720p/50	1080i/60	1080p/30	1080sf/24	
720p/59	1080p/23	1080p/50	1080sf/25	
720p/60	1080p/24	1080p/59	1080sf/29	

Note: Each group contains its own mutually compatible standards

- Press ENTER to activate the setting

6.4.2 Setting the Output Standard Mode

To set the output standard mode:

- Press ▼ or ▲ until **SET1. Outp. Stand mode**
- Press ◄ or ► to choose settings: **AUTObyRefSour.** or **FORCED**

Note: In order to make the AUTO Output Standard mode available, it is necessary to turn on the Genlock State (see Section 6.6.3). If the Genlock State is turned off, then FORCED STANDARD is used.

Note: If the SDI output standards are strictly defined and never change, FORCED mode is recommended.

- Press ENTER to save the setting temporarily (only until powered off)

6.4.3 Generating a Test Signal

To generate a test signal:

- Press ▼ or ▲ until **SET1.TestSignal** appears
- Press ◄ or ► to choose the settings: **NO TEST SIGNAL**, **COLOR BARS100%**, **SPLIT BARS100%** or **RAMP100%**
- Press ENTER to run the test
- To stop the test, return to **NO TEST SIGNAL** and press ENTER

6.5 Setting the Image Size and Position

This parameter is used to set the image size or position on the screen. The image size can be changed separately for SDTV and HDTV input signals.

To set the image size or position:

- Press MENU to enter the menu mode
- Press ▼ or ▲ until SET1. IMAGE SIZE / POS (enter submenu) is displayed
- Press ENTER go into the submenu
- Press ▼ and ▲ to navigate through the submenu

6.5.1 Setting the Image Size from the Video Signal Menu

To set the horizontal image size:

- Press ▼ or ▲ until SET1 SDTV input H size, (or in the case of an HDTV input SET1 HDTV input H size appears), press ◄ to decrease the horizontal image size in 1% steps and ► to increase the size by the same amount
- Press ENTER to save the setting temporarily (until powered down)
- Save the new size settings using the Saving Setups procedure (see Section 6.2)

To set the vertical image size:

- Press ▼ or ▲ until SET1 SDTV input V size, (or in the case of an HDTV input SET1 HDTV input V size appears), press ◄ to decrease the image size in 1% steps and ► to increase the size by the same amount
- Press ENTER to save the setting temporarily (until powered down)
- Save the new Size settings using the Saving Setups procedure (see Section 6.2)

6.5.2 Setting an Image Position from the Video Signal Menu

To set the horizontal image position (for both SDTV and HDTV inputs):

- Press ▼ or ▲ until SET1 Horizontal Position appears, press ◄ to shift horizontally the image to the left in 0.2% steps and ► to shift to the right by the same amount
- Press ENTER to save the setting temporarily (until powered down)
- Save the new position settings using the Saving Setups procedure (see Section 6.2)

To set the vertical image position (for both SDTV and HDTV inputs):

- Press ▼ or ▲ until SET1 Vertical Position appears, press ◄ to shift vertically the image to the top of the screen in 0.2% steps and ► to shift downwards by the same amount

- Press ENTER to save the setting temporarily (until powered down)
- Save the new position settings using the Saving Setups procedure (see Section 6.2)

6.6 Setting the Genlock

Use this menu to set genlock parameters; activation, source and timing.

To set the genlock:

- Press MENU to enter the menu mode
- Press ▼ or ▲ until **SET1. GENLOCK (enter submenu)** is displayed
- Press ENTER go into the submenu
- Press ▼ and ▲ to navigate through the submenu

6.6.1 Resetting the Genlock

To reset the genlock:

- From **SET1 GENLOCK FACTORY RESET**, press ENTER to reset the genlock to its factory settings
- Save the new genlock using the procedure Saving Setups in Section 6.2

6.6.2 Activating/Deactivating the Genlock

When the genlock is turned OFF, an internal crystal generator is used as the reference source.

To activate or deactivate the genlock:

- Press ▼ or ▲ until **SET1 GenlckState**
- Press ◄ or ► to choose the settings: **OFF(FreeRun)** or **ON**
- Press ENTER to save the setting temporarily (until powered down)

6.6.3 Setting the Genlock Reference Source

Use the genlock reference source to select either a dedicated genlock input or any one of the four SDI inputs.

To set the genlock reference source:

- Press ▼ or ▲ until **SET1. RefSource SDI**
- Press ◄ or ► to choose the settings: **SDI GenlockInput** or **AnalogGenlockInp**
- Press ENTER to save the setting temporarily (until powered down)

6.6.4 Setting the Horizontal and Vertical Timing

Use the horizontal timing to adjust the horizontal delay of an output signal relative to the reference source signal.

Possible timing values are:

- -9800nsec to +9800nsec, step 7nsec in 3G HD mode
- -19600nsec to +19600nsec, step 14nsec in HDTV mode
- -51800nsec to +51800nsec, step 37nsec in SDTV mode

Default timing is 0nsec.

Negative values advance the output signal, positive values retard the signal.

To speed the adjustment, press and hold the appropriate ◄ or ► button (repeat mode). For 16x ultra repeat mode, press and hold the appropriate ◄ or ► button while pressing the ENTER button. In this case, the adjusted parameter changes by steps of 16 units.

To quickly reset to the factory default value, press and hold both ◄ and ► buttons together for 1 sec.

To set the horizontal timing:

- Press ▼ or ▲ until **SET1 SDI TIMING Horiz**, press ◄ to advance the timing by the appropriate step and ► to retard the timing
- Press ENTER to save the setting temporarily (until powered down)
- Save the new horizontal timing using the procedure Saving Setups in Section 6.2

To set the vertical timing:

- Press ▼ or ▲ until **SET1. SDI TIMING Vert**, press ◄ to advance the timing by **1 TV line** and ► to retard the timing
- Press ENTER to save the setting temporarily (until powered down)
- Save the new horizontal timing using the procedure Saving Setups in Section 6.2

6.7 Setting the No-Signal Screen

The no-signal screen appears when there is no input signal or when input and output signals are incompatible.

To set the no-signal screen:

- Press MENU to enter the menu mode
- Press ▼ or ▲ until **NoSignal Screen** is displayed
- Press ◄ or ► to choose the settings: **BLUE SCREEN**, **BLACK SCREEN** or **NoColorInsert (default)**
- Press ENTER to save the setting

Note: This assignment affects all 16 setups (presets) after ENTER is pressed. The setting is saved with auto power-down.

6.8 Setting the Machine Address

To set the machine address:

- Press MENU to enter the menu mode
- Press ▼ or ▲ until **Address of machine** is displayed
- Press ◄ or ► to choose the settings: **0x18** (default), **0x19**
- Press ENTER to save the setting

Note: This assignment affects all 16 setups (presets) after ENTER is pressed. The setting is saved with auto power-down.

6.9 Displaying Status

The next five top-level menu items give a read-only status display of all SDI inputs, the genlock input, the reference lock and audio in.

To display a status:

- Press MENU to enter the menu mode
- Press ▼ or ▲ until the status of the desired SDI input, SDI genlock, analog genlock, audio in or reference lock is displayed

6.10 Setting LCD Brightness

This setting adjusts the brightness of the LCD display.

To set LCD brightness:

- Press MENU to enter the menu mode
- Press ▼ or ▲ until **LCD Operating Brightness** is displayed
- Press ◄ or ► to change the settings from **0%** to **100%** (95% default)

Note: This assignment affects all 16 setups (presets) after ENTER is pressed. The setting is saved with auto power-down.

6.11 Setting the Sleep Mode

This setting adjusts the sleep mode brightness of the LCD display.

To set the sleep mode brightness of the LCD:

- Press MENU to enter the menu mode
- Press ▼ or ▲ until **LCD Sleep Mode Brightness** is displayed
- Press ◄ or ► to change the settings from **0%** to **100%** (50% default)

Note: This assignment affects all 16 setups (presets) after ENTER is pressed. The setting is saved with auto power-down.

6.12 Enabling and Activating the Genlock Input Video Function

You can set the GenlockIN input to be used as an SDI video input in addition to the IN1 and IN2 inputs. When this function is enabled, the ▲ (Up) button is used to switch the Genlock input signal to both outputs, irrespective of whether or not there are signals present on IN1 and IN2.

To enable and activate the Genlock input as a video input function:

- Press MENU to enter the menu mode
- Use the arrow buttons to scroll down to “SDI GenlInput as VideoINP”
- Select Enable
- Press ENTER
  The setting is saved with auto power-down
- Press MENU to exit the menu
- Press the ▲ Up button to switch the Genlock input signal to both outputs. Both Input buttons light
- Press either of the Input buttons to cancel and return the input selection to normal operation

7 Technical Specifications

The **SP-1G** technical specifications are shown in the following table.

INPUTS:	2 SDI/HD-SDI, 1 genlock 75Ω on BNC connectors
OUTPUTS:	2 SDI/HD-SDI, 1 genlock 75Ω on BNC connectors
CONTROLS:	9 front panel buttons, RS-232
POWER CONSUMPTION:	5V DC, 1.2A
OPERATING TEMPERATURE:	0° to +40°C (32° to 104°F)
STORAGE TEMPERATURE:	-40° to +70°C (-40° to 158°F)
HUMIDITY:	10% to 90%, RHL non-condensing
DIMENSIONS:	21.5cm x 16.2cm x 4.4cm (8.5" x 6.4" x 1.7") W, D, H
WEIGHT:	0.95kg (2.1lbs)
INCLUDED ACCESSORIES:	Power supply
OPTIONS:	RK-1 19” rack mount

8 Kramer Protocol 2000

Protocol 2000 for the **SP-1G** is described below. For RS-232, data is at 9600 baud, no parity, 8 data bits, and 1 stop bit. All values shown are hexadecimal.

Supported Commands (I value in decimal)

Command	I	D	E	Comments
Reset	PC → 0 PC ← 0	0 0	0 → Machine 0 ← Machine	Power up, pseudo
Genlock Reset	PC → 17 PC ← 17	0 0	0 → Machine 0 ← Machine	Timing and phase
Read Parameter	PC → 32 PC ← 32	Parameter Number Parameter Number	0 → Machine Parameter Number ← Machine	
Write Parameter	PC → 33 PC ← 33	Parameter Number Parameter Number	Parameter → Machine Parameter ← Machine	
Save	PC → 35 PC ← 35	Initial source setup number Initial source setup number	Destination (new) setup number → Machine Destination (new) setup number ← Machine	If only saving adjusted parameters in the initial setup number (no setup number change), then E must be equal to D, the initial setup number.
Identify Machine Name	PC → 61 PC ← 61	1 Machine name high	0 → Machine Machine name low ← Machine	
Identify Software Version	PC → 61 PC ← 61	3 SW version high	0 → Machine SW version low ← Machine	

Parameter Addresses

There are global parameters that are invariable in the case of a setup number change, and local parameters that have appropriate E values for each setup number (16 different values, stored in special memory). During write or read operations with local parameters, the PC gets access only to the active local parameter that corresponds to an actual setup number. Certain local parameters (not all) are represented in two-byte format because of their large adjustment. To distinguish between one-byte and two-byte parameters, as well as global and local parameters, the hex address of any parameter (value "D"), contains a two-byte format flag – D7 (MSB) and a local parameter flag – D6.
All global parameters have the one-byte format, therefore their addresses (D7 = 0, D6 = 0) do not exceed 0x3f(hex) or 63(dec). One-byte local parameters (D7 = 0, D6 = 1) have addresses greater than 63(dec), but less than 128(dec). Two-byte local parameters (D7 = 1, D6 = 1) have addresses greater than 192(dec). Note that while writing or reading two-byte parameters (PC -> machine), you must send two consecutive write or read commands (each command having a conventional 4-byte structure) for low (first) and high bytes with a minimal time interval between them.

Global Parameters (D and E values in decimal) for Supported Commands (I value in decimal)			
Parameter	D	E	Comments
Panel Lock	0	0 – Off (default) 1 – On	
No_Signal_Color	1	0 – No_Color_Insert (default) 1 – Black screen 2 – Blue screen	
PC Addr	2	0, 1 (corresponds to 0x18 and 0x19)	Read only
Setup Number	3	0 – 15 (0 corresponds to setup#1, 15 – to setup#16)	
The next addresses allow periodic request and read of the machine status (read only):			
Actual Output Standard	8	0 – 22	Status of actual output standard, read only.
		0 – 480i/60 1 – 576i/50 2 – 720p/50 3 – 720p/59 4 – 720p/60 5 – 1080i/50 6 – 1080i59	

Global Parameters (D and E values in decimal) for Supported Commands (I value in decimal)			
Parameter	D	E	Comments
		7 – 1080i/60 8 – 1080p/23 9 – 1080p/24 10 – 1080p/25 11 – 1080p/29 12 – 1080p/30 13 – 1080p/50 14 – 1080p/59 15 – 1080p/60 16 – 1080sf/23 17 – 1080sf/24 18 – 1080sf/25 19 – 1080sf/29 20 – 1080sf/30 21 – Unidentified signal 22 – No input signal	
IN1-IN2 Standard Status	9	0 – 22	E values and standards same as above (read only)
Genlock SDI Input Status	10	0 – 22	E values and standards same as above (read only)
Analog Genl Input Status	11	0 – 22	E values and standards same as above (read only)
Genlock Status	15	E = 0 – 2	Read only
		0 – No reference signal 1 – Loss of lock to reference 2 – Proper lock to reference	

One-Byte Local Parameters			
Parameter	D	E	Comments
Forced Standard	64	0 – 20	(May be used as input forced standard and as output forced standard. See two next items – "Input Standard Mode" and "Output Standard Mode")
		0 – 480i/60 1 – 576i/50 2 – 720p/50 3 – 720p/59 4 – 720p/60 5 – 1080i/50 6 – 1080i59 7 – 1080i/60 8 – 1080p/23 9 – 1080p/24 10 – 1080p/25 11 – 1080p/29 12 – 1080p/30 13 – 1080p/50 14 – 1080p/59 15 – 1080p/60 16 – 1080sf/23 17 – 1080sf/24 18 – 1080sf/25 19 – 1080sf/29 20 – 1080sf/30	
Input Standard Mode	65	E = 0 – 1 0 – Auto identified standard using appropriate input signal (on each channel separately) (default) 1 – Forced input standard defined in previous item	
Output Standard Mode	66	E = 0 – 1 0 – (Default) auto identified standard, based on signal that has been preselected as reference genlock source. (This source can be selected between either dedicated genlock SDI input or Analog input, see parameter D = 71 – genlock reference source). If genlock is turned off, forced standard is used	

One-Byte Local Parameters			
Parameter	D	E	Comments
		instead of auto. 1 – Forced output standard defined in parameter D = 0.	
Test_Signal	67	E = 0 – 3 0 – Test off (default) 1 – Color bars 100% 2 – Split bars 100% 3 – Ramp 100%	
Video Input Switch	68	E = 0 – 2 0 – IN1 selected 1 – IN2 selected 2 – SDI Genlock input selected as video source	
Genlock Off/On	70	E = 0 – 1 0 – off (default) 1 – on	
Genlock_Ref_Source	71	E = 0 – 1 defines input that will be used as genlock reference 0 – dedicated genlock SDI input (default) 1 – dedicated Analog genlock input	

Two-Byte Local Parameters			
Parameter	D	E	Comments
Low Byte of Horizontal Timing H	200	E0 = H % 256 i.e. Remainder on dividing H by 256 (signed)	
High Byte of Horizontal Timing H	201	E1 = Floor(H/256) i.e. greatest signed integer less or equal to (H/256) where H = -1400 to +1400 7ns step (3G HD) 14ns step (HDTV) 37ns step (SDTV) H = 0 – default	
Low Byte of Vertical Timing V	202	E0 = V % 256 i.e. Remainder on dividing V by 256 (signed)	
High Byte of Vertical Timing V	203	E1 = Floor (V/256) i.e. Greatest signed integer less or equal to (V/256) where V = -625 to +625 1 line step V = 0 – default	

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SAFETY WARNING
Disconnect the unit from the power supply before opening and servicing

P/N: 2900-000766 Rev: 4