

picoLink series

SDM-874p
SD/HD Serial Digital
to DVI Converter
Guide to Installation and Operation

M804-9900-103
8 Sep 2008



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Radio Frequency Interference and Immunity

This unit generates, uses and can radiate radio frequency energy. If the unit is not properly installed and used in accordance with this guide, it may cause interference with radio communications. Operation with non-certified peripheral devices is likely to result in interference with radio and television reception. This equipment has been tested and complies with the limits in accordance with the specifications in:

FCC Part 15, Subpart B
CE EN50081-1:1992
CE EN50082-1:1992

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1 SDM-874p SD/HD Serial Digital to DVI Converter

1.1 Introduction

The SDM-874p is a miniature digital video interface, converting SDI/HDSDI video signals to Digital RGB (DVI-HDTV). It provides automatic input scan rate detection and supports a wide variety of input formats, including 525i, 625i, 720p, 1080i and 1080p. The primary application is to convert SD/HD serial digital video to Digital RGB to feed DVI-HDTV displays and projectors (CRT, LCD, Plasma, DLP, D-ILA, etc.). In order to support the emerging popularity of 24p equipment and displays, the SDM-874p outputs DVI-D with selectable 3:2 sequence insertion. The SDM-874p is compatible with any 1280x768 or 1920x1200 native resolution display, including the Apple Cinema Display.

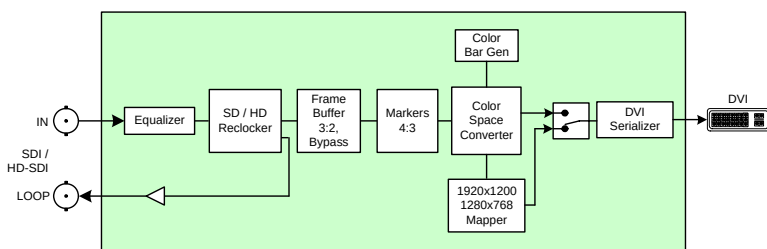


Figure 1: SDM-874p functional block diagram

1.2 Features

- SDI / HD SDI video input with active loop-through
- Digital RGB DVI-D output (DVI-HDTV compliant)
- Supports 525i, 625i, 720p, 1080p, 1080i with automatic input scan rate detection
- Supports many processing modes (see the Input/Output formats table on pages 10 & 11)
- 1920x1200 Apple HD Cinema display compatible
- Built-in test signal and 4:3 markers
- Compact stand-alone package

2 Overview

Figure 2 illustrates the SDM-874p's major parts and their locations. A high-definition or standard definition digital video source is connected to the SDI/HD SDI IN BNC and the Digital RGB output is provided by the DVI-I connector. Error status is provided by the status LED. Finally, the power source is connected to the lockable power connector.

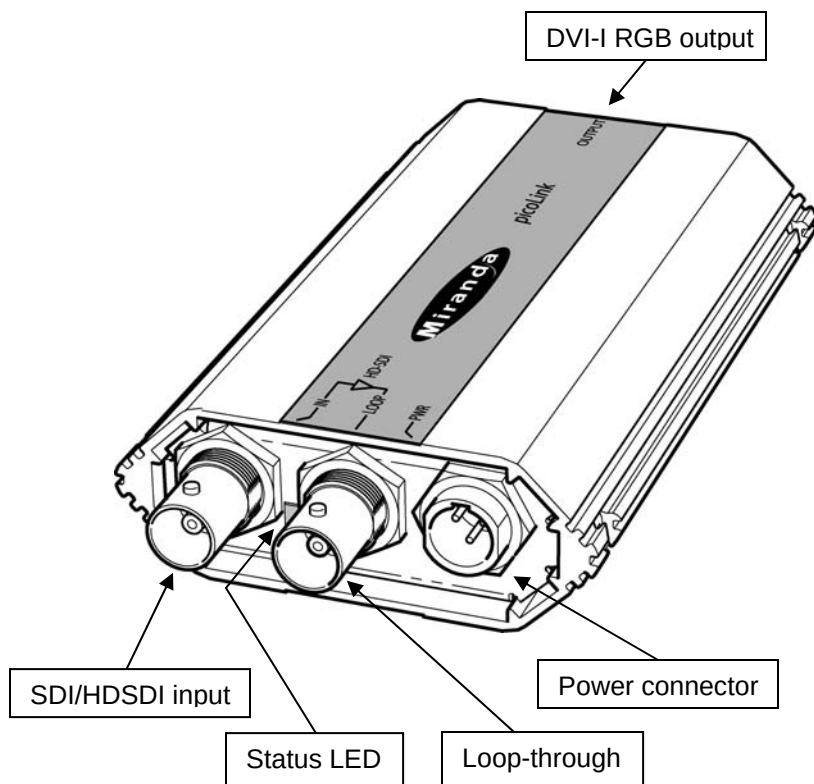


Figure 2: Overall view of the SDM-874p

3 Installation

3.1 Power Supply

The LKS-WSU power supply provides power to the SDM-874p for 110 V and 220 V operation. The power supply is a regulated +5 VDC@2.4 A power source. The SDM-874p employs a mini XLR-3 connector for its power needs. Figure 3 shows a detailed pinout of the male connector.

(male connector-facing)

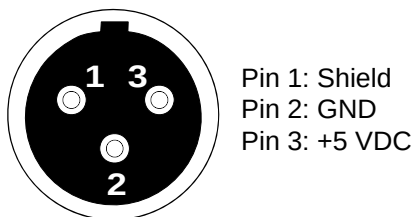


Figure 3: Power connector pinout

3.2 HD/SD Serial Digital Video Input & Active Loop-Through

Connect a high-definition or standard definition digital video signal to the BNC labeled SDI/HD-SDI IN:

- The high-definition serial digital input signal must conform to the SMPTE 292M standard.
- The standard definition serial digital input signal must conform to the SMPTE 259M-C standard.

Make sure that the input signal cable has a maximum length of 100m (328') and that all serial digital video equipment is connected point-to-point. For instance, there must be a point-to-point connection between the SDI/HD SDI IN BNC and the source equipment. If a T-connector is used to connect other equipment, the maximum specified cable length is no longer valid.

3.3 RGB Output

The high definition DVI video output signal (RGB digital) is provided by the DVI-I (female) labeled OUTPUT. The output format is automatically selected according to the input signal format and the user control settings.

For a complete list of the input and output formats supported by the SDM-874p, see the *Supported Formats* table on pages 10 & 11.

4 Operation

Figure 4 shows the control panel of the SDM-874p, indicating the five slide switches, the Select pushbutton, and the LED indicators that show the status established using the Select pushbutton.

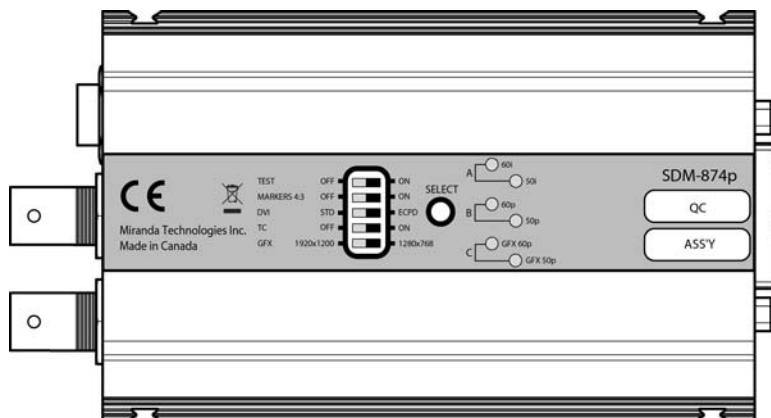


Figure 4: SDM-874p control panel

4.1 Slide Switch functions:

Test

On: Enable the test pattern on the output. The test pattern consists of HDTV color bars.

Off: The test pattern is disabled.

Note: in order to output a test pattern, a valid input signal must be present.

Markers 4:3

On: Display 4:3 markers on the 16:9 image.

Off: The 4:3 markers are disabled.

DVI

STD: Video levels are maintained from the SD/HD SDI input to the DVI output.

EXPD: Video levels from the SD/HD SDI input (16 to 235 in 8 bits) are expanded to the full graphic range (0 to 255 in 8 bits) at the DVI output.

TC

On: If time code is detected on the input, it will be burned into the output video. If no time code is detected, 00:00:00 will be displayed.

Off: The time code display in the output video will be disabled.

GFX

1920x1200: Select 1920x1200 as the resolution of the graphic display output (GFX 60p and GFX 50p). The input video (SD, 720, 1080) will be mapped into this image structure.

1280x768: Select 1280x768 as the resolution of the graphic display output (GFX 60p and GFX 50p). The input video (SD, 720) will be mapped into this image structure.

4.2 *Select Pushbutton functions:*

The *Select* pushbutton cycles the operation of the SDM-874p through its available operating modes. The current operating mode is indicated by the six LEDs located to the right of the pushbutton, as shown in Figure 4. The six named modes are selected when their LED only is illuminated. Modes A, B and C are selected when the pair of LEDs indicated are illuminated.

- When the pushbutton is pushed once, the LED indicating the currently selected processing mode flashes red and green. Subsequent pushes cycle the SDM-874p through the available operating modes.

The available operating modes are:

- **Mode A:** direct output – the output signal format matches the input format
- **60i:** the output is forced to 60i
- **50i:** the output is forced to 50i
- **Mode B:** reserved for future use
- **60p:** the output is forced to 60p
- **50p:** the output is forced to 50p
- **Mode C:** reserved for future use
- **GFX 60p:** the output is forced to the selected GFX output resolution (1920x1200 or 1280x768) at 60p.
- **GFX 50p:** the output is forced to the selected GFX output resolution (1920x1200 or 1280x768) at 50p.

The SDM-874p automatically detects the input format. It then internally invokes the appropriate processing to produce the result selected by the user controls. Among the processing modes implemented in the SDM-874p are:

- Progressive Segmented Frame (PsF) video takes a progressive source and divides the image into two fields as if it had been an interlaced source. This video mimics the interlaced format and can be processed accordingly. The SDM-874p converts P→PsF and PsF→P.
- The Panasonic Varicam system packages video originated at various frame rates into a standard 59.94i or 60i output by adding redundant frames. The original frames are flagged, allowing the original frame-rate signal to be reconstituted. The SDM-874p supports Varicam output flagged at 60, 50, 25 and 24 fps.

See the Supported Formats table on pages 10 and 11 for a detailed list of the outputs corresponding to the supported input formats and user control settings.

4.3 *Status LED*

The multi-colored status LED, located between the input and loop-through connectors, identifies any input errors and the selection of the test pattern as follows:

- Green: Indicates the SDM-874p is powered and has detected a valid input signal.
- Red: Indicates an error in the input signal has been detected or that there is no input signal installed.
- Yellow: The test pattern is selected.

If an error is detected on the input signal when the test pattern is selected, the status LED will remain red.

5 Specifications

INPUT

Signal:	SMPTE 259M-C (270Mbps) and SMPTE 292M (1.485, 1.485/1.001 Gbps) with re-clocked loop-through output
Cable length:	100 m (Belden 1694A)
Return loss:	>15 dB up to 1.5 GHz
Connector:	75W BNC

OUTPUT

Normal mode:	DVI output compliant to EIA/CEA-861-B
GFX mode	DVI output compliant to VESA DMT
Connector:	DVI-I, Female, compliant to DVI 1.0 pin out

GENERAL

Quantization:	10 bits
Power voltage:	5VDC
Consumption:	4 W
Temperature operating range:	0 – 30° C

Appendix – Supported Formats

Input format	GFX Switch	Mode Selected	Output format
525i	-	A	1440x486 59.94i
	-	60p	720x486 59.94p
	1920	GFX 60p	1920x1200 60p
	1280	GFX 60p	1280x768 60p
625i	-	A	1440x576 50i
	-	50p	720x576 50p
	1920	GFX 50p	1920x1200 50p
	1280	GFX 50p	1280x768 50p
1280x720 60p	-	A	1280x720 60p
	1920	GFX 60p	1920x1200 60p
	1280	GFX 60p	1280x768 60p
(Varicam / 24 fps)	-	50p	1280x720 50p
	1920	GFX 50p	1920x1200 50p
	1280	GFX 50p	1280x768 50p
(Varicam / 25 fps)	-	50p	1280x720 50p
	1920	GFX 50p	1920x1200 50p
	1280	GFX 50p	1280x768 50p
(Varicam / 50 fps)	-	50p	1280x720 50p
	1920	GFX 50p	1920x1200 50p
	1280	GFX 50p	1280x768 50p
1280x720 50p	-	A	1280x720 50p
	1920	GFX 50p	1920x1200 50p
	1280	GFX 50p	1280x768 50p
1920x1080 60i	-	A	1920x1080 60i
	-	60p	1920x1080 60p
	1920	GFX 60p	1920x1200 60p
1920x1080 50i/25PsF	-	A	1920x1080 50i
	-	50p	1920x1080 50p
	1920	GFX 50p	1920x1200 50p
	1920	GFX 60p	1920x1200 60p

Supported Formats (continued)

Input format	GFX Switch	Mode Selected	Output format
1920x1080 24PsF	-	A	1920x1080 24PsF
	-	60i	1920x1080 60i
	-	60p	1920x1080 60p
	1920	GFX 60p	1920x1200 60p
	-	50i	1920x1080 25PsF
	-	50p	1920x1080 50p
	1920	GFX 50p	1920x1200 50p
1920x1080 25p	-	A	1920x1080 25p
	-	50i	1920x1080 25PsF
	-	50p	1920x1080 50p
	1920	GFX 50p	1920x1200 50p
1920x1080 24p	-	A	1920x1080 24p
	-	60i	1920x1080 60i
	-	60p	1920x1080 60p
	1920	GFX 60p	1920x1200 60p
	-	50i	1920x1080 25PsF
	-	50p	1920x1080 50p
	1920	GFX 50p	1920x1200 50p

Note: in all cases where the format is specified as 24 or 60, the specification also includes 23.98 and 59.94 when appropriate. For example, 1920x1080 60i should be understood to also refer to 1920x1080 59.94i, and the output will follow the input, so that an input at 23.98 will yield an output at 59.94, whereas an input at 24 will yield an output at 60.

As an exception, 525i inputs are always at 59.94, and so the normal mode outputs have been explicitly specified as 59.94. However, the GFX outputs are specifically 60 in this case, and have been so specified.