picoLink Series

SDM-873p

Guide to Installation
and Operation

M640-9500-100

SD/HD Serial
Digital to CAV
Converter

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Printed in Canada
April 2005

Miranda
Technologies inc.
3499 Douglas-B. Floreani, St-Laurent
(Québec) Canada, H4S 2C6
Tel.: 514.333.1772
Fax. 514.333.9828
www.miranda.com

SDM-873p

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 devicesi 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

Contact Miranda

For technical assistance, please contact the Miranda Technical Support centre nearest you:

Americas
Telephone:
   +1-800-224-7882
e-mail:
   techsupp@miranda.com

Asia
Telephone:
   +81-3-5730-2987
e-mail:
   asiatech@miranda.com

Europe, Middle East, Africa, UK
Telephone:
   +44 (0) 1491 820222
e-mail:
   eurotech@miranda.com

France (only)
Telephone:
   +33 (0) 1 55 86 87 88
e-mail:
   francetech@miranda.com

Visit our web site at www.miranda.com

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1 SDM-873p SD/HD Serial Digital to CAV Converter

1.1 Introduction

The SDM-873p is a miniature digital video interface converting SDI/HDSDI video signal to CAV (YPbPr or RGB). 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 CAV to feed VGA monitors and projectors (CRT, LCD, Plasma, DLP, D-ILA, etc.). In order to support the emerging popularity of 24p equipment and displays, the SDM-873p outputs CAV over a DVI-I connector with selectable 3:2 sequence insertion.
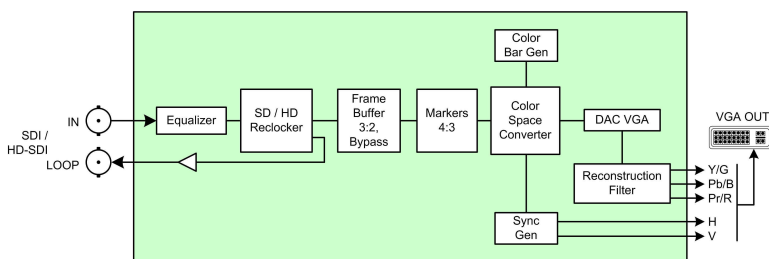
Figure 1: *SDM-873p functional block diagram*

1.2 Features

- SDI / HD SDI video input with active loop-through
- CAV output (YPbPr or RGB)
- Composite Sync on all Components (Bi-Level or Tri-Level) or Separate H and V sync out (TTL-Level)
- Supports 525i, 625i, 720p, 1080p, 1080i with automatic input scan rate detection
- Supports direct output, p to PsF, PsF to p, 3:2 insert, Panasonic Varicam
- Built-in test signal and 4:3 markers
- Compact stand-alone package

2 Overview

Figure 2 illustrates the SDM-873p'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 CAV 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.
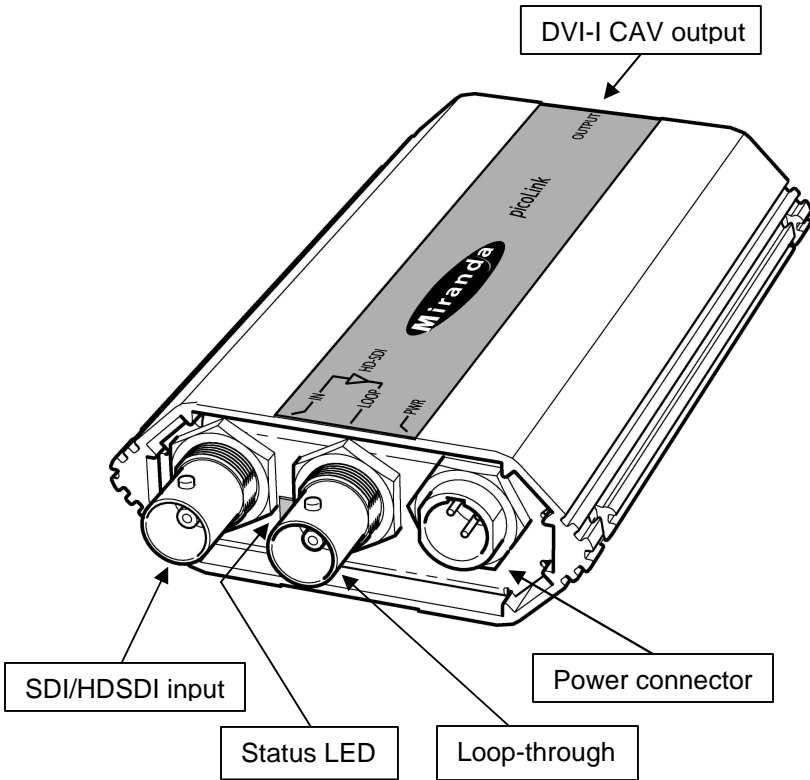
DVI-I CAV output

SDI/HDSDI input

Status LED

Loop-through

Power connector

Figure 2: *Overall view of the SDM-873p*

3   Installation

3.1   Power Supply

The LKS-WSU power supply provides power to the SDM-873p for 110 V and 220 V operation. The power supply is a regulated +5 VDC@2.4 A power source. The SDM-873p employs a mini XLR-3 connector for its power needs. Figure 3 shows a detailed pinout of the male connector.
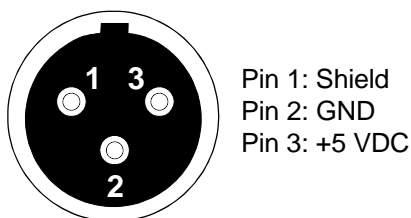
(male connector-facing)

Pin 1: Shield
Pin 2: GND
Pin 3: +5 VDC

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 75m (250') 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 CAV Output

The high definition component analog video output signal (Y/Pb/Pr and RGB) is provided by the DVI-I (female) labeled OUTPUT. A DVI-to-VGA adapter is supplied to facilitate cabling. The output format is automatically selected according to the input signal.

For a complete list of the input and output formats supported by the SDM-873p and related SMPTE standards, see the *Supported Formats* table on page 10.

4   Operation

Figure 4 shows the control panel of the SDM-873p, indicating the five slide switches, the Select pushbutton, and the LED indicators that show the status established using the Select pushbutton.

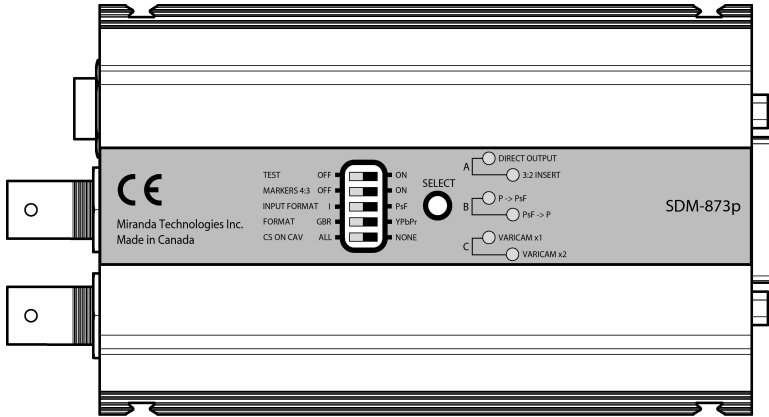**Figure 4:** *SDM-873p control panel*

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.

Input Format

I   Select this option for all input formats except PsF

PsF   Select this option for PsF inputs only.

Format

GBR: Select GBR for the CAV output format

YPbPr: Select Y/Pb/Pr for the CAV output format.

CS on CAV

All: Add Composite Sync (CS) to the color components of the signal. Composite sync is bi-level for GBR output and tri-level for YPbPr output.

None: Output separate H and V sync, but no CS on the components.   .

4.2   Select Pushbutton functions:

The *Select* pushbutton cycles the operation of the SDM-873p 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-873p through the available operating modes.

The available operating modes are:

- *Mode A:* use this mode to output a 25PsF signal from a 24p or 24PsF input signal.

- **Direct output:** use this selection to output a signal with the same format as the input signal.

- **3:2 Insert:**   inserts a 3:2 sequence to output a 59.94i and 60i signal.

- **Mode B:** reserved for future use

- **P->PsF:** use this selection to output an interlaced PsF signal from a progressive input signal.

- **PsF->P:** use this selection to output a progressive signal from an interlaced (PsF) input signal.

- **Mode C:** reserved for future use

- **Varicam 1:1:** use this setting to output a 24p, 25p or 30p signal from a 60p or 59.94p signal originating from a Panasonic Varicam system.

- **Varicam 1:2 :** use this setting to output a 50p signal from a 60p signal originating from a Panasonic Varicam system.

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 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.

See the Supported Formats table on page 10 for details on outputs corresponding to each of these operating modes.

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-873p 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: 75 m (250') (Belden 1694A)

Return loss: >15 dB up to 1.5 GHz

Connector: 75W BNC

Output
Signal: Analog user-selectable Y/Pb/Pr or GBR

Connector: DVI-I, Female, compliant to DVI 1.0 pin
                              out

Analog Format: Auto select based on input signal
                              (See *Supported Format* Table below)

Sync out: Bi-Level or Tri-Level CS on all
                              components
                              –   or (user-selectable) –
                              no CS, but H and V sync enabled

H/V Level: TTL Level

General specifications
Quantization: 10 bits
Processing delay: see *Supported Format* Table below
Power voltage: 5VDC
Consumption: 5 W

Supported Formats

Input format	Standard	Mode	VGA & DVI output format	Note
525	SMPTE-125M SMPTE-267M	Dir.Output	720x486 59.94i	
625	EBU	Dir.Output	720x576 50i	
1280x720 60p	SMPTE-296M	Dir.Output	1280x720 60p	
		Varicam 1:1	1280x720 24p	1
		Varicam 1:1	1280x720 25p	1
		Varicam 1:1	1280x720 30p	1
		Varicam 1:2	1280x720 50p	1
1280x720 59.94p	SMPTE-296M	Dir.Output	1280x720 59.94p	
		Varicam 1:1	1280x720 23.98p	1
		Varicam 1:1	1280x720 29.97p	1
1280x720 50p	SMPTE-296M	Dir.Output	1280x720 50p	
1920x1080 60i	SMPTE-274M	Dir.Output	1920x1080 60i	
1920x1080 59.94i	SMPTE-274M	Dir.Output	1920x1080 59.94i	
1920x1080 50i	SMPTE-274M	Dir.Output	1920x1080 50i	
1920x1080 25 PsF	SMPTE-274M	Dir.Output	1920x1080 25 PsF	
		PsF→ P	1920x1080 25p	
1920x1080 24 PsF	SMPTE-274M	Dir.Output	1920x1080 24 PsF	
		Mode A	1920x1080 25 PsF	
		PsF→ P	1920x1080 24p	
1920x1080 23.98PsF	SMPTE-274M	Dir.Output	1920x1080 23.98 PsF	
		PsF→ P	1920x1080 23.98p	
1920x1080 25p	SMPTE-274M	Dir.Output	1920x1080 25p	
		P→PsF	1920x1080 25 PsF	
1920x1080 24p	SMPTE-274M	Dir.Output	1920x1080 24p	
		Mode A	1920x1080 25 PsF	
		3 :2 Insert	1920x1080 60i	
		P→PsF	1920x1080 24 PsF	
1920x1080 23.98p	SMPTE-274M	Dir. Output	1920x1080 23.98p	
		3 :2 Insert	1920x1080 59.94i	
		P→PsF	1920x1080 23.98 PsF	

Note 1: The SDM-873p reads the flags embedded in the Varicam signal, and auto-selects the appropriate output format.

Analog Luminance (Y) Performance
Frequency response: ±0.25 dB up to 30 MHz

Analog Chrominance (Pb, Pr) Performance
Frequency response: ±0.4 dB up to 15 MHz

Y, Pb, Pr
Group delay: <6.7 ns up to 30 MHz
Signal to Noise ratio: 58 dB up to 30 MHz
Return loss: >20 dB up to 30 MHz