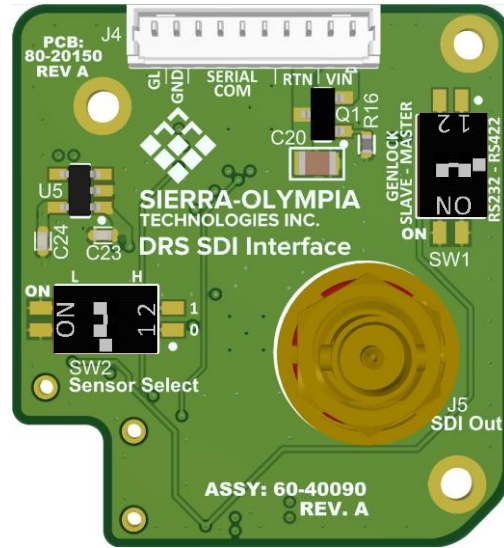


# NOTES:

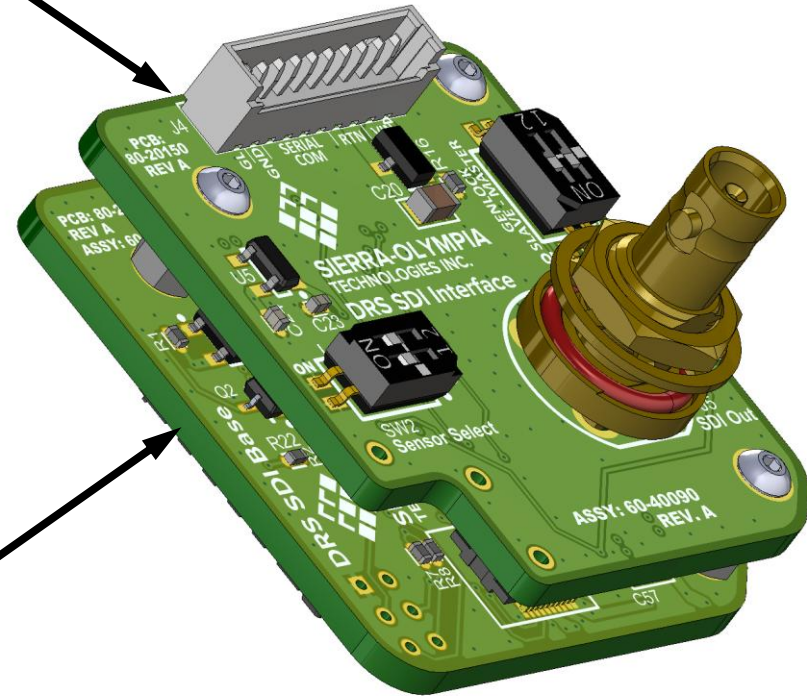
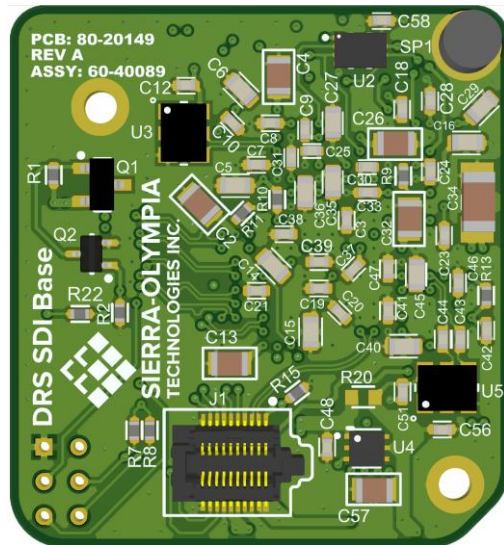
1. Mating connectors, pinouts, and signal names on Sheet 3.
2. Observe ESD precautions while handling.
3. System could be used in an OEM configuration by removing the upper interface board. For more information, reach out SOTI Engineering.


REVISIONS				
REV	DESCRIPTION	ECO	DATE	Eng.
A	Initial Release	1756	2024-05-16	GO
B	SW2 definition and SOTI UART commands	1962	2026-01-19	GO

**DRS SDI Interface Board**  
(upper PCA in stack)




**DRS SDI Base Board**  
(lower PCA in stack)




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# NOTES:

4. LEGEND:  Position 1 indicator

 Changes to SW1 take immediate effect.

 SW2 Configurations on Page 4.

## SW1 - CONFIGURATIONS

### SW1-1 – Serial Com

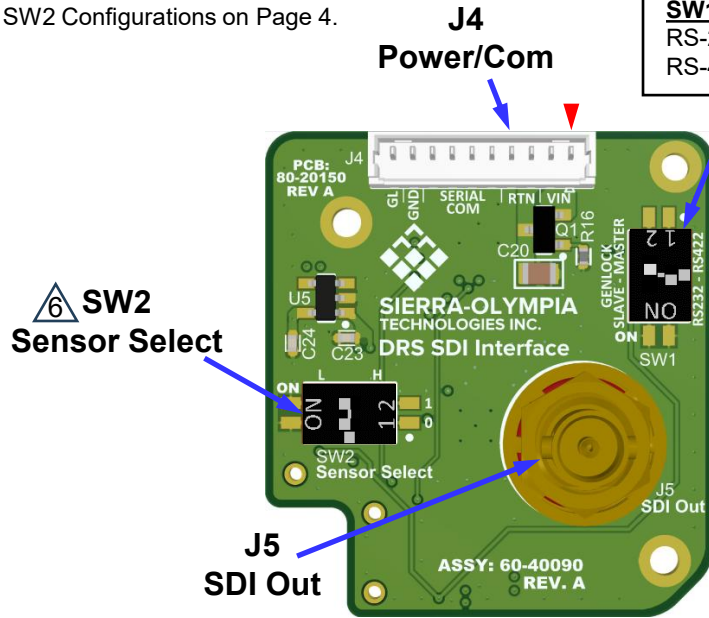
RS-232 (default)  
RS-422

SW1-1 ON  
SW1-1 OFF

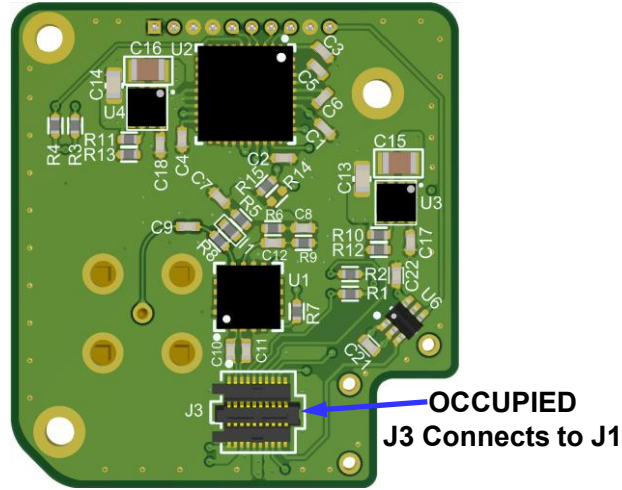
### SW1-2 – Genlock Control

Slave  
Master (default)

SW1-2 ON  
SW1-2 OFF

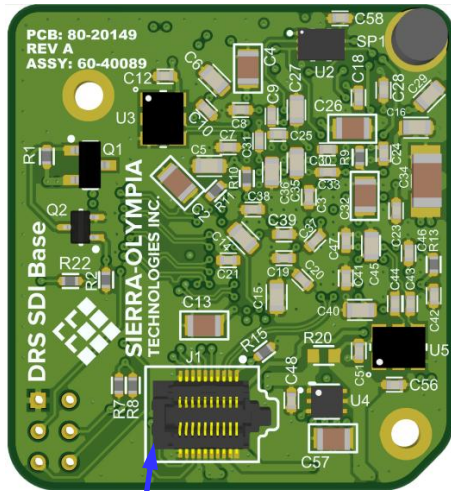


Board Top

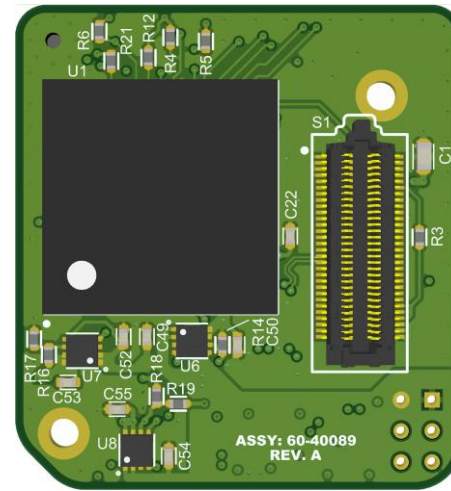


Board Bottom

## DRS SDI Interface Board DRS SDI Base Board



OCCUPIED  
J1 Connects to J3



S1  
DRS SENSOR  
CONNECTOR

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## NOTES:

7. RX indicates input to camera from external system.  
TX indicates output from camera to external system.
8. Exceeding Max Ratings could cause damage to components.

### J4 - Power/Com

Molex PicoBlade 10-pin, 1.25mm pitch

Mating connector housing: Molex 0510211000

Connector terminals: Molex 0500588000 (28-32 AWG)

**Suggested Mating Cable: Molex 2181121004**

Camera Model	Steady State Power @12Vin	Momentary Peak Power (Shutter)
Tenum 1280	4.1W	7.7W for 100ms
Tenum 640	3.1W	8.3W for 100ms

NOTE: In an enclosure, stirred air is recommended.

Position	Name	Max Rating
1	12 VDC Nominal Input Power	5.0 - 17.0 VDC
2		
3	Input Power Return	-
4		
5	TX_422_P	+/- 5V Nominal
6	TX_422_N / TX_RS232	+/- 12.5V Max
7	RX_422_P	+/- 25V
8	RX_422_N / RX_RS232	
9	Ground	-
10	3.3V Genlock IO	0 - 5.5V

#### Genlock Direction:

Master Mode - Output

Slave Mode - Input

#### Genlock Input Threshold:

$V_{IL} = 0.8V$

$V_{IH} = 1.7V$

#### UART Settings: 57600 8-N-1

For available DRS UART commands, see the DRS SW ICD:

1031753\_Tenum 640 Software ICD

1040046\_Tenum 1280 Software ICD

\* Connecting to the DRS Camera Control Software will change the camera settings, and the image may not look correct. The settings will be corrected when the camera is power cycled.

SOTI specific UART commands listed on Page 6.

### J5 - SDI Out

HD-BNC Connector

**Suggested Mating Cable: Amphenol 095-850-218-072**

SMPTE 292M, 1.485GHz HD-SDI, 75Ω impedance.

Output image mapping for the different sensors is pictured on page 5.

Camera Model	SMPTE ST	Supported Modes
Tenum 1280	274M:2008	1080p30
Tenum 640	296:2012	720p60/30

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# Sensor Select Switch Definition

## SW2 - Sensor Select

SW2 has different function depending on the sensor attached.

Switch settings are sampled at startup. Changes made during operation requires a -rst command or power cycle to take effect.

NOTE: Because HD-SDI is always a YUV422 format, the data presented on the SDI output will always be YUV422. The sensor select switch changes what the sensor outputs, 8-bit or YUV. In 8-bit mode you are limited to white-hot/black-hot, but YUV allows the user to select between the different DRS color palettes, including white-hot/black-hot.

### Tenum 640 function:

SW2.1 sets Sensor Output Format

SW2.2 sets Output Framerate (only in Genlock Master)

While in Genlock Master:

SW2.1	SW2.2	Function
ON	ON	60Hz Output, YUV
ON	OFF	30Hz Output, YUV
OFF	ON	60Hz Output, 8-bit
OFF	OFF	30Hz Output, 8-bit

While in Genlock Slave:

SW2.1	SW2.2	Function
ON	x	YUV
OFF	x	8-bit

Tenum 640 with P2 processor is usable only in 8-bit modes.

Selecting YUV on a P2 processor will result in no output video.

Tenum 640 with P3 processor is usable in any mode.

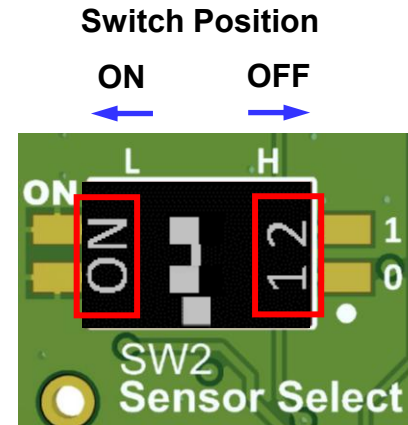
The part number tells if the sensor is a P2 or a P3. P2 has a 0 in the sixth digit after the dash, and P3 has a 1. For example:


P3 PN = 1027621-0110610

P2 PN = 1027621-0110600

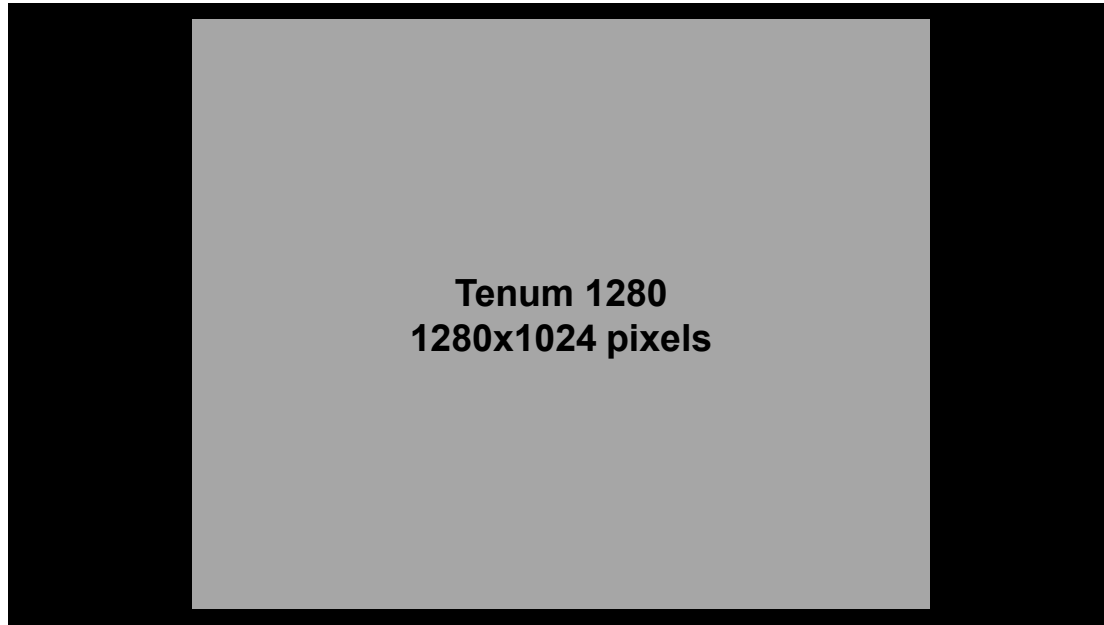
### Tenum 1280 function:

SW2 function not yet defined for Tenum 1280. Changing the switches has no effect; the sensor is always in YUV 30Hz output.

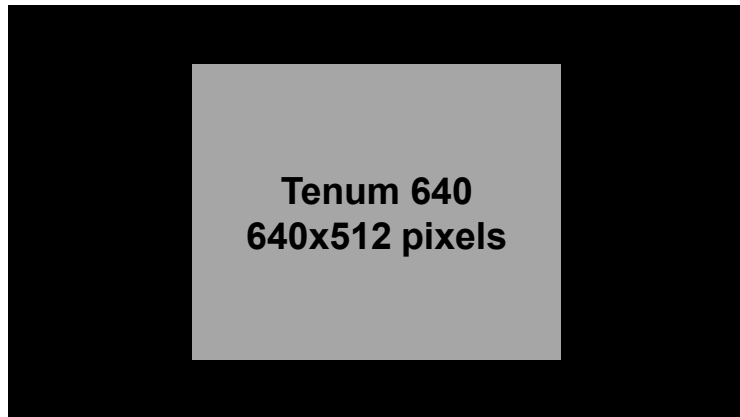


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# Output Image Mapping



**SMPTE 274M 1080p**  
**1920x1080 pixels**  
 Image to the left depicts a Tenum 1280 frame centered in a 1080p frame with black borders.



**SMPTE 296 720p**  
**1280x720 pixels**  
 Image to the left depicts a Tenum 640 frame centered in a 720p frame with black borders.

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# SOTI UART Commands

The SOTI FPGA has a limited UART command set, and shares the same UART as the sensor. All of the FPGA commands follow the format "soti-xxxx." The values and descriptions of "-xxxx" are listed below. These commands are ignored by the sensor.

The commands can be in all lower case or all upper case (i.e. soti-xxxx or SOTI-XXXX), but mixed case is not valid. Format of the end of line characters on the transmit message does not matter. An invalid command will result in no reply from the FPGA.

All reply messages end in an ASCII Line Feed character (0x0A).

## -vers (-VERS)

Prints out the SOTI FPGA build version.

FPGA Version : <xx.xx.xxxx>

## -info (-INFO)

Prints out the SOTI FPGA build version and timestamp of the build, along with details reflecting the sensor attached and the state of the SW1 and SW2 switches:

FPGA Version : <xx.xx.xxxx>

FPGA Build Date : <MM-DD-YYYY, HH:MM>

Sensor : <Tenum 640 or Tenum 1280>

Genlock Mode : <Master or Slave>

HD-SDI Format : <720p30, 720p60, or 1080p30>

Pixel Format : <YUV422 or 8-bit Mono>

## -srst (-SRST)

Performs a reset of the system. This is useful if you change the SW2 states and want to update with the changes.

## -tpen (-TPEN)

Enables the SMPTE RP 219:2002 720p60 Test Pattern on the SDI output.


## -tpds (-TPDS)

Disables the Test Pattern on the SDI Output.

## SDI FPGA Changelog:

v1.2: Initial Release

v2.0: Fixes video sync issue when digital zoom is used. Minor change to printout with -info command.

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