

SUNDANCE proposes a **Special University Offer** for an Advanced Video Imaging solution based on the SMT339 hardware platform and full software tools. It includes also full integration and compatibility with MATLAB/Simulink® tools for co-simulation and co-design, enabling automatic generation of both C and VHDL code directly from the user's Simulink® schematics.

## Description

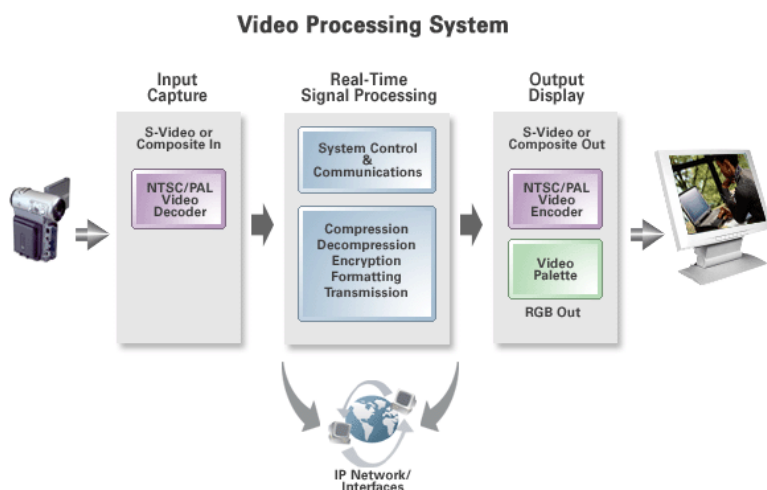
The package is a highly professional system based on **DSP**, **FPGA** and **Video** interface technologies.

The SMT339 is a high-performance architecture for I/O interfacing, pre-processing, processing and display of any type of data, including standard and non-standard industrial cameras; it can be used in many applications, such as Robotics, Automation, Video Surveillance, Digital TV, etc. The module features a single Philips Semiconductors **SAA7109AE/108AE** video decoder/encoder accepting as input most PAL and NTSC standards. Processed images can be output as PAL, NTSC or VGA (1280x1024, or HDTV Y/Pb/Pr).

The SMT339 can be plugged into a standard TIM single-width slot (such as that of the SMT310, included in this special offer) and can be accessed by either a standard Comport, or Rocket Serial Link (**RSL**) Interface (8 lanes available, 2.5 Gbit/s for each lane). The module fully supports the Sundance LVDS Bus (**SLB**) interface for use with mezzanine cards, providing the flexibility for more image formats to be accepted and other output formats to be generated. Non-standard digital data, including camera interfaces such as Camera Link™, are also possible. For additional control, Sundance Modular FPGA Design provides two 8 bit, 20 MBytes/s Communication Ports that could be used as serial links to other modules or as additional I/O control and data interfaces.

A powerful **Virtex-4 FPGA** (XC4VFX60-10) is used onboard as the pre-processing unit for image data. 8 Mbytes of ZBT SRAM are provided as an FPGA memory resource. Functions such as Colour Space Conversion (CSC), Discrete Cosine Transform (DCT), Fast Fourier Transform (FFT), convolution, 1D & 2D FIR filters and OEM proprietary algorithms can be implemented using standard and off-the-shelf Xilinx® and Sundance tools and cores. If required, the Virtex-4 has 2 Power PC hardware cores that can be incorporated into the system design.

In the data processing pipeline, after the FPGA, there is a fast Texas Instruments **TMS320DM642** DSP. Operating on the pre-processed data coming from the FPGA, this processor adds additional power and flexibility to the SMT339 module. The DSP is fully software compatible with C64x using **Code Composer Studio**. The DM642 runs at a clock rate of 720MHz. It features a two-level cache-based architecture and can perform four 16 x 16 multiplications or eight 8 x 8 multiplications per clock cycle. 64 Mbytes of external memory (EMIF SDRAM) are provided for data storage.



What SMT339 offers to the OEMs is an innovative combination of functionality, speed, flexibility and scalability in a single module, available for various OEM platforms (PCI, cPCI,

PXI, VME, Stand-Alone). Inherent parallelism in the module architecture provides OEMs with processing power capable of sustaining even the most demanding applications. The innovative design and functionality are enhanced by the built-in SMT339 interfaces to other Sundance modules (ADCs, DACs, DSPs, FPGAs, etc).

The data flow can be displayed on the host PC in real-time, thanks to highly optimised PCI drivers and tools. The included Co-simulation and Co-design toolbox - **SMT6040** - is fully compatible with *MATLAB® / Simulink®*.

The Diamond Video Library (included in the FULL offer) is the way to access the SMT339 video capabilities. It makes the most out of the **TMS320DM642** Video/Imaging DSP, providing the user with a ready-made interface to the DSP video ports, thus making video I/O possible. The Video Library comes as a simple, well-documented C library for Diamond.

Modularity, flexibility and scalability are design features that have become even more important with the increasing complexity of real-time embedded systems. Moreover, the ability to rapidly build and simulate the system with simple building blocks is essential to leave more time to focus on algorithms and proof of concepts. Sundance can offer the above design features thanks to our "building blocks" philosophy, which makes it possible for the end-user to experiment with optimal task allocation between the FPGA and the DSP by using the Diamond RTOS & the Diamond Integrated Development Environment (IDE).

Video & Imaging Kit	Description	Basic solution	Full solution
<b>SMT310</b>	Single-Site PCI Carrier; V3 PCI Chip-set	YES	YES
<b>SMT339</b>	Advanced Imaging Module; TMS320DM642@720 MHz; Xilinx Virtex-4 XC4VFX60 FPGA	YES	YES
<b>SMT539</b>	Rear Panel	YES	YES
<b>SMT6001</b>	Sundance Flash Programming Utility (SFPU)	YES	YES
<b>SMT6012</b>	EPK Driver for Code Composer Studio	YES	YES
<b>SMT6025</b>	Host-side software interface to Sundance hardware	YES	YES
<b>SMT6300</b>	Carrier Board Device Driver Package	YES	YES
<b>SMT6400</b>	DSP Module Package	YES	YES
<b>SMT6500</b>	FPGA Module Package	YES	YES
<b>CCS (1)</b>	Code Composer Studio	YES	YES
<b>Diamond DSP</b>	Single-DSP RTOS for 'C6x, requires T.I. 'C6x Compiler	NO	YES
<b>Diamond FPGA</b>	Diamond FPGA - Single FPGA version	NO	YES
<b>SMT6040</b>	Sundance <-> Simulink® Toolbox for DSP & FPGA co-design and code generation	NO	YES

1. Texas Instruments will provide a copy of the full version of Code Composer Studio (CCS) to each University who buys one of these packages. TI will send this directly to the purchasers after they have placed their order with SUNDANCE.
2. Clicking on the Product Number of the first column of the table will take you directly to the product web page where you can download FULL information and technical documentation such as user manuals, technical specifications, etc.

## Where to buy?

This product is distributed by Kane Computing Ltd

**For further information, please contact:**

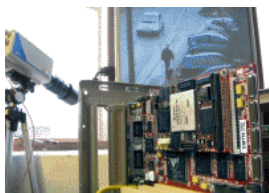
**[sales@kanecomputing.com](mailto:sales@kanecomputing.com)**

The *Advanced Video-Imaging* system includes a Carrier Board (**SMT310**) and Re-configurable Add-on Module (**SMT339**).

The SMT310 is a single site, half-length PCI module carrier developed to provide access to a

re-configurable module over the PCI bus running at 33MHz with a 32-bit data bus. The card has an on-board JTAG **ACT8990** controller (XDS-510 compatible JTAG Master) that allows applications debug.

A 1 Mbytes of SDRAM is mapped on to the global bus and can be accessed by the SMT339 a global resource or by the PCI bridge. The board requires a 3.3 volt supply that is taken from the PCI edge connector and is made available at the fixing pillars for the module.



System (SMT8039)



Carrier Board  
(SMT310)



Add-on Module  
(SMT339)

### SMT310 characteristics:

- Single module site
- PCI 'master mode' (PCI DMA) support on one **ComPort**
- Host interface bandwidth via global bus in excess of 100 Mbytes/s @ 33MHz PCI clock
- Host interface via ComPort in excess of 10 Mbytes/s
- **Buffered External ComPort**
- Expansion via inter-processor ComPorts
- **Sundance Digital Bus** (SDB) port for interface to other SDB compatible products
- 1Mbyte Shared SRAM interface between PCI and Module
- 512Kbytes FLASH ROM for configuration etc.
- On-board XDS-510 compatible JTAG Master (**ACT8990**)
- 12 months warranty
- Weight Approx. 136g

### SMT339 characteristics:

- Single-width module
- 720MHz TMS320DM642 Fixed Point DSP
- Xilinx Virtex-4 FX60 FPGA (XC4VFX6010FF1152)
- 64 MBytes of SDRAM @ 100MHz
- Two 8-bit Comports up to 20Mbytes/s each for communications and configuration
- Rocket Serial Link (RSL) interface for high-speed I/O
- 8MBytes of FLASH ROM for configuration / booting
- Philips Semiconductors SAA7109AE/108AE video decoder/encoder directly connected to the FPGA (external video input and output ports)
- JTAG Diagnostics Port
- SLB interface for general purpose I/O
- TIM standard compatible
- 12 months warranty

## Training Course and Technical Support

The package comes with full documentation, examples, demo applications, source code and whatever essential to provide self-training to users. Plus, SUNDANCE offer an online Technical Support System (<http://support.sundance.com>) and each customer will be allocated a FORUM and one or more engineers for help.

Please download the document **SUNDANCE HELP**, which is intended to give you an overview of the hardware, firmware and software available from Sundance.

Support for TI's Code Composer Studio is provided through the "E-PIC" (<http://www.ti.com/europe/epic>)

Both hardware and software come with a one-year warranty.

This is a new offer, changed as of January 2007



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