From simple drivers to complete systems.
From prototype to series.

High-end electronics solutions for your business.

Our customers are innovators of the automotive, medical, broadcast and industrial sectors. For them, we develop custom-made high-end solutions in embedded electronic engineering beyond industrial standards.

Building on many years of experience, the know-how of our highly qualified and specialized engineers and technicians and our tireless pursuit of innovation, we constantly develop cutting-edge products. They include systems and modules composed of hardware, software and mechanical components and they offer solutions in the fields of highly integrated electronics and high-speed processor assemblies with complex user interfaces and programmable logic.

In this catalog we have compiled an extract from the spectrum of our state-of-the-art products for you. Please do not hesitate to contact us if you have any questions. We look forward to providing the solution to your challenge.

Solectrix - Innovative thinking in embedded electronic engineering at the highest level.
Industrial

Our experience with digital imaging and advanced pattern recognition algorithms can also be applied to industrial automation. Other industrial applications we have worked on include the control of potentially dangerous devices like lasers or heavy machinery where safe operation is paramount, leading to tough requirements for the embedded electronics.

- Base board design
- Industrial control units
- Laser control units

Automotive

With modern cars incorporating more electronics every day, Advanced Driver Assistance Systems offer increasingly advanced applications for imaging systems.

From digital rear-view mirrors to advanced driver assistance systems with features like pedestrian detection. Modern car design increasingly relies on electronics for safety. Our experience working on such applications also extends to the hardware-in-the-loop systems needed during the verification and qualification phases.

- ADAS camera systems
- Video and data capturing
- HDR imaging
- Hardware-in-the-loop systems
- Handheld diagnostic systems
- Medical device development
- 2D and 3D medical imaging
- Documented development processes

Medical

With human lives at stake, medical applications leave no room for error.

Whether it’s the required real-time reaction to some critical event, impeccable measurement results from lab devices or reliably flawless images of surgery in progress, we deliver the results required to meet the medical market’s tough regulatory standards.

- Handheld diagnostic systems
- Medical device development
- 2D and 3D medical imaging
- Documented development processes

Broadcast

Whether it’s TV productions, live broadcasts or movies for the big screen: the quality demanded from digital imaging solutions is constantly increasing.

4K resolution, stereoscopic 3D, direct recording to formats like DNxHD and ProRes or the streaming of uncompressed video data over distances up to 180 meters: these are just a few of the challenges we have gladly accepted in past years. Our image processing, streaming and recording solutions satisfy even the most demanding filmmakers today and tomorrow.

- Camera development
- Sensor control
- Image processing
- Image compression and storage
Introducing the modular SX proFRAME system

The SX proFRAME system builds on years of experience developing Hardware-in-the-Loop (HiL) systems for safety-critical automotive applications. Its modular approach building on the flexibility of a powerful FPGA core provides the perfectly matched high-end solution for your HiL needs and is ideal for rapid prototyping. Use the SX proFRAME system for Man-in-the-Middle logging or develop your image processing algorithms on our universal system using data processing frameworks like OpenCV or CUDA before implementing them in your customized embedded control unit (ECU).

The unique range of our camera adapters allows you to connect nearly all types of automotive cameras. Adapters for other camera models or other types of data (e.g., GigE Vision, Camera Link, HD-SDI, CAN...) are available on request.

A typical system consists of an SX proFRAME base board equipped with up to four camera adapters, each with up to two inputs or outputs to cameras or ECUs. The PCIe base board is installed in a standard Windows or Linux-based host PC with the respective Solectrix software libraries and a customer-specific application. The SX proFRAME SYNC adapters enable synchronization of multiple base boards and the use of external trigger sources or receivers, e.g., for the synchronization of other in-car sensors like LiDAR.

Applications

| Hardware-in-the-Loop systems (HiL) | Development, diagnostics and validation of Advanced Driver Assistance Systems (ADAS) |
| Surround view camera systems | R&D platform for IP module development (rapid prototyping) |

SX proFRAME features and advantages

- PC-based system for Linux and Windows
- Xilinx Artix-7 FPGA
- Real-time processing of large amounts of data independent from other hardware requirements
- Prepared for customer or Solectrix IP plugins
- In-system-programming of FPGA logic for different operating modes
- High-performance DMA engine for data transfers from/to host
- Timestamp-based recording and playback/streaming of RAW video data
- Recording of I²C messages between ECU and camera
- ECU-independent I²C messaging to camera
- Handling of a large number of data sources or targets (multiple ECUs) simultaneously
- Synchronization of multiple cameras per base board
- Synchronization of multiple base boards
- Support for broadcast and nearly all types of automotive cameras via various adapters
- Host-independent adapter management via internal softcore CPU
- Quick integration of the latest camera models
- Programmable pixel clock
SX proFRAME
Simplified example setup for two cameras and one ECU

- Support for a wide range of automotive and broadcast cameras
- More adapter types (e.g., HD-SDI, GigE Vision, Camera Link, CAN...) available on request
- Short development time due to standardized interfaces

- FPGA-based PCI Express processing platform Xilinx Artix-7
- FPGA with customer or Solectrix imaging IP for real-time processing of incoming data
- Flexible system core for easy customization: Connect up to four adapters per base board

- Customer Data Source / Target
- SX proFRAME Camera Adapters
- SX proFRAME Base Board
- Host PC with PCI Express

Windows or Linux PC running customer application with SX proFRAME software libraries
The core of the PC-based SX proFRAME system is a standard PCI Express board with a Xilinx Artix-7 FPGA and 512 MByte of DDR memory.

The board’s FPGA-based real-time data processing enables the handling of large amounts of data independent from any other hardware requirements. For video data, take advantage of our imaging IP modules, building on Solectrix’ extensive know-how in the digital imaging field!

The SX proFRAME 2.0 HS is also available as a version with two additional high-speed adapter interfaces, the SX proFRAME 2.0 HS. Each of these interfaces offers two lanes operating at up to 6.6 Gbps for a total of four high-speed lanes per base board.

With a size of 195 mm × 110 mm, the SX proFRAME base boards’ dimensions fall inbetween a half-length and full-length PCIe board. With adapter boards on top the full height is 16 mm, occupying one standard PCIe slot. With adapters on both sides it is 32 mm, occupying two slots.

SX proFRAME Base Board 2.0
• 4× SX camera adapter interface
  • 2× on top
  • 2× on bottom
• PCIe Gen2 x1/x4 interface
Xilinx Artix-7 FPGA (XC7A200T)
  • 215,360 logic cells
  • 740 DSP splices
  • 12.83 Mbit block RAM
• Up to 512 MByte on-board DDR3 frame buffer memory
• Board dimensions: 195 mm × 110 mm, inbetween a half-length and full-length PCIe board

Art.No. 500601

SX proFRAME Base Board 2.0 LVDS
• Only for SX camAD MAX92xxA/92xxA, SX camAD MAX92xxA and SX camAD TITAN/9xx

Art.No. 500616

SX proFRAME Base Board 2.0 HS
• 4× SX camera adapter interface
  • 2× on top
  • 2× on bottom
• 2× SX high-speed adapter interface
  • 2× on top
• PCIe Gen2 x1/x4 interface
Xilinx Artix-7 FPGA (XC7A200T)
  • 215,360 logic cells
  • 740 DSP splices
  • 12.83 Mbit block RAM
• Up to 512 MByte on-board DDR3 frame buffer memory
• Board dimensions: 195 mm × 110 mm, inbetween a half-length and full-length PCIe board
• For SX camAD CoaXPress and SX camAD DUAL CoaXPress

Art.No. 500708

With adapter boards on top the full height is 16 mm, occupying one standard PCIe slot. With adapters on both sides it is 32 mm, occupying two slots.
SX proFRAME camera adapters
Uniquely wide range for nearly all types of automotive cameras

SX camAD T1913/1914
- Texas Instruments DS90UB913Q
  FPD-Link III serializer with bidirectional control channel, 10 to 100 MHz, 10- and 12-bit DC-balanced
- Texas Instruments DS90UB914Q
  FPD-Link III deserializer with bidirectional control channel, 10 to 100 MHz, 10- and 12-bit DC-balanced
- Camera input & output on Rosenberger FAKRA plugs (59S2AQ-40MT5-Z_1)
- Power over Coax (PoC), 5 to 10 V, 300 mA
- Lattice MachXO2 FPGA (XO2-1200U)
  for interfacing with the grabber board
- I²C serial EEPROM for link configuration
- Pixel clock generator for playback

SX camAD DUAL T1914
- 2x Texas Instruments DS90UB914Q
  FPD-Link III deserializer, 10 to 100 MHz, 10- and 12-bit DC-balanced
- 2x camera input on Rosenberger FAKRA plugs (59S2AQ-40MT5-Z_1)
- Power over Coax (PoC), 5 to 10 V, 300 mA
- Lattice MachXO2 FPGA (XO2-1200U)
  for interfacing with the grabber board
- I²C serial EEPROM for link configuration
- Pixel clock generator for playback

SX camAD T1925/926
- Texas Instruments DS90UB925Q-Q1
  24-bit color FPD-Link III serializer with bidirectional control channel, 5 to 85 MHz
- Texas Instruments DS90UB926Q
  24-bit color FPD-Link III deserializer with bidirectional control channel, 5 to 85 MHz
- Camera input and output on RosenbergerHSD plugs (D4S20G-400A5-Z)

SX camAD T1933/934
- Texas Instruments DS90UB933-Q1
  FPD-Link III serializer for 1 MP/60 fps and 2 MP/30 fps cameras, 12-bit 100 MHz
- Texas Instruments DS90UB934-Q1
  FPD-Link III deserializer for 1 MP/60 fps and 2 MP/30 fps cameras, 12-bit 100 MHz
- Camera input and output on Rosenberger FAKRA plugs (59S2AQ-40MT5-Z_1)
- Power over Coax (PoC), 5 to 10 V, 300 mA
- Lattice MachXO2 FPGA (XO2-1200U)
  for interfacing with the grabber board
- I²C serial EEPROM for link configuration
- Pixel clock generator for playback
SX proFRAME camera adapters
Uniquely wide range for nearly all types of automotive cameras

SX camAD DUAL TI953
- 2× Texas Instruments DS90UB953-Q1
  MIPI CSI-2 FPD-Link II serializer for 2 MP/60 fps cameras and Radar, up to 3.2 Gbps
- 2× camera output on Rosenberger FAKRA plugs (59S2AQ-40MT5-Z_1)
- Power over Coax (PoC), 5 to 10 V, 300 mA
- Lattice MachXO3 FPGA (MachXO3LF-4300) for interfacing with the grabber board
- I²C serial EEPROM for link configuration and camera simulation
- Pixel clock generator for playback

SX camAD TI953/954
- Texas Instruments DS90UB953-Q1
  MIPI CSI-2 FPD-Link II serializer for 2 MP/60 fps cameras and Radar, up to 3.2 Gbps
- Texas Instruments DS90UB954-Q1
  MIPI CSI-2 FPD-Link II dual deserializer for 2 MP/60 fps cameras and Radar
- Camera input and output on Rosenberger FAKRA plugs (59S2AQ-40MT5-Z_1)
- Power over Coax (PoC), 5 to 10 V, 300 mA
- Lattice MachXO3 FPGA (MachXO3LF-4300) for interfacing with the grabber board
- I²C serial EEPROM for link configuration and camera simulation
- Pixel clock generator for playback

SX camAD TI954
- Texas Instruments DS90UB954-Q1
  Dual MIPI CSI-2 FPD-Link III deserializer for 2 MP/60 fps cameras and Radar
- 2× camera input on Rosenberger FAKRA plugs (59S2AQ-40MT5-Z_1)
  Power over Coax (PoC), 5 to 10 V, 300 mA
- Lattice MachXO3 FPGA (MachXO3LF-4300) for interfacing with the grabber board
- I²C serial EEPROM for link configuration and camera simulation
- Pixel clock generator for playback

SX camAD TI9xx/9xx
- Texas Instruments DS90UB9xx
  MIPI CSI-2 FPD-Link IV serializer with up to 6 Gbps
- Texas Instruments DS90UB9xx
  MIPI CSI-2 FPD-Link IV dual deserializer with up to 6 Gbps
- Camera input an output on Rosenberger FAKRA plugs (59S2AQ-40MT5-Z_1)
  Power over Coax (PoC), 5 to 10 V, 300 mA
- Lattice CrossLink FPGA (LIF-MD6000) for image interfacing with the grabber board
- Lattice MachXO3 FPGA for GPIO and frame synchronization with the grabber board
- I²C serial EEPROM for link configuration and camera simulation
- Pixel clock generator for playback

NEW SX corAM base board 2.0 LVDS

coming soon

SX proFRAME
SX proFRAME camera adapters
Uniquely wide range for nearly all types of automotive cameras

SX camAD MAX9240A/9271
- Maxim MAX9240A
  25-bit GMSL deserializer, 6.25 to 100 MHz, with line fault detect
- Maxim MAX9271
  16-bit GMSL serializer, 6.25 to 100 MHz
- Camera input and output on Rosenberger FAKRA plugs (59S2AQ-40MTS-Z_1)
- Power over Coax (PoC), 5 to 10 V, 300 mA
- Lattice MachXO2 FPGA (K02-1200U) for interfacing with the grabber board
- I2C serial EEPROM for link configuration and camera simulation
- Pixel clock generator for playback

SX camAD DUAL MAX9240A
- 2× Maxim MAX9240A
  25-bit GMSL deserializer, 6.25 to 100 MHz, with line fault detect
- Camera input on Rosenberger FAKRA plugs (59S2AQ-40MTS-Z_1)
- Power over Coax (PoC), 5 to 10 V, 300 mA
- Lattice MachXO2 FPGA (K02-1200U) for interfacing with the grabber board
- I2C serial EEPROM for link configuration and camera simulation
- Pixel clock generator for playback

SX camAD MAX96705/96706
- Maxim MAX96705
  16-bit GMSL serializer with high-immunity/bandwidth mode
- Maxim MAX96706
  14-bit GMSL deserializer
- Camera input and output on Rosenberger FAKRA plugs (59S2AQ-40MTS-Z_1)
- Power over Coax (PoC), 5 to 10 V, 300 mA
- Lattice MachXO2 FPGA (K02-1200U) for interfacing with the grabber board
- I2C serial EEPROM for link configuration and camera simulation
- Pixel clock generator for playback
SX proFRAME camera adapters
Uniquely wide range for nearly all types of automotive cameras

SX camAD MAX92xxA
Only for SX proFRAME Base Board 2.0 LVDS
- Maxim MAX92xxA
- Maxim MAX92xxA
- Camera input and output on Rosenberger FAKRA plugs (59S2AQ-40MTS-Z_1)
- Power over Coax (PoC), 5 to 10 V, 300 mA
- Lattice CrossLink FPGA (LIF-MD6000) for image data interfacing with the grabber board
- Lattice MachXO3 FPGA for GPIO and frame synchronization with the grabber board
- I2C serial EEPROM for link configuration and camera simulation
- Pixel clock generator for playback

Art. No. 500798

SX camAD MAX92xxA/92xxA
- Maxim MAX92xxA
- MIPI CSI-2 GMSL2 dual deserializer with up to 6 Gbps
- 2× camera input on Rosenberger FAKRA plugs (59S2AQ-40MTS-Z_1)
- Power over Coax (PoC), 5 to 10 V, 300 mA
- Lattice CrossLink FPGA (LIF-MD6000) for image data interfacing with the grabber board
- Lattice MachXO3 FPGA for GPIO and frame synchronization with the grabber board
- I2C serial EEPROM for link configuration and camera simulation
- Pixel clock generator for playback

Art. No. 500793
SXC2 and SXC3
High-resolution camera heads for cutting-edge applications
in medical technology and industrial automation

The next generation of high-end camera heads by Solectrix

More than 14 years of experience in the development of state-of-the-art camera technology for cinema and television productions flowed into the new generation of camera heads. They combine image quality for the highest demands with the reliability that we achieve with our automotive camera systems, making them ideal for use in industrial automation and modern medical technology.

NEW

Art.No. 500824
Image sensor Sony IMX183CLK-J, rolling shutter, 16 mm
Monochromatic images at 12 bit color depth
Resolution 5496 × 3672 pixels
Framerate 15 fps

The SXC2 is equipped with a 9-megapixel color sensor while the SXC3 features a 20-megapixel sensor for monochromatic images. The miniature remote camera heads (w × h × d: 42 × 42 × 55 mm) weigh only 0.4 kg each. The FPD-Link III interface enables use with a wide range of capturing systems, including our own SX proFRAME. The physical connection is realized via a single coax cable for both data and power.

Both models support C and CS mount lenses.

Art.No. 500822
Image sensor Sony IMX183cj-QJ, rolling shutter, 11 mm
Color images at 10 bit color depth
Resolution 3840 × 2160 pixels
Framerate 30 fps

The SXC2 is equipped with a 9-megapixel color sensor while the SXC3 features a 20-megapixel sensor for monochromatic images. The miniature remote camera heads (w × h × d: 42 × 42 × 55 mm) weigh only 0.4 kg each. The FPD-Link III interface enables use with a wide range of capturing systems, including our own SX proFRAME. The physical connection is realized via a single coax cable for both data and power.

Both models support C and CS mount lenses.
SX camAD CoaXPress
Only for SX proFRAME 2.0 HS

- Microchip EQCO31R20
  Coaxial cable video equalizer for bidirectional communication
  1.25 Gbps to 3.125 Gbps video downlink
  Supports 8b/10 NRZ coding and the CoaXPress standard
- Camera input on coax connector
  (Cinch Connectivity Solutions UCBJE20-1)
  Power over Coax (PoC), 18 V, 1 A
- Atmel ATtiny85 microcontroller
  for control of Power over Coax (PoC) supply voltage

SX camAD DUAL CoaXPress
Only for SX proFRAME 2.0 HS

- 2× Microchip EQCO62R20
  Coaxial cable video equalizer for bidirectional communication
  1.25 Gbps to 6.25 Gbps video downlink
  Supports 8b/10 NRZ coding and the CoaXPress standard
- 2× camera input on coax connectors
  (Cinch Connectivity Solutions UCBJE20-1)
  Power over Coax (PoC), 18 V, 1 A
- 2× Atmel ATtiny85 microcontroller
  for control of Power over Coax (PoC) supply voltage

SX proFRAME camera adapters
for broadcast applications
and further accessories

SX proFRAME SYNC

The SX proFRAME SYNC adapters are galvanically isolated interfaces. They make it possible to obtain sync signals for camera triggering from external trigger sources and to generate trigger signals in our SX proFRAME boards. These signals can be sent to cameras or external trigger receivers. Our adapters are available as In/Out and Dual In.

SX proFRAME SYNC IN/OUT  Art.No. 500627
SX proFRAME SYNC DUAL IN  Art.No. 500629
Integration of SX proFRAME boards into your Windows or Linux system is made easy by our custom software libraries.
These include drivers and sources for base boards, camera and sync adapters, a GPU-accelerated software library for realization of image signal processing functions, and various simple example applications for basic camera control. Our specialists are available to support your team during the initial commissioning phase.

**Base board drivers and sources**
- for Linux and Windows 7
- DMA-based for high data throughput
- Trigger and synchronization functions
- PC camera control and link configuration

**Camera adapter drivers and sources**
- Programmable Power over Coax (PoC)
- Programmable pixel clock for playback modes

**Configuration for various camera types**
- Omnivision
- ON Semiconductor
- Sony
- and more

**Sample applications for camera control**
- Image capturing
- Image playback
- PC control
- and more

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**FPGA-based imaging modules**
Take advantage of the flexibility of the SX proFRAME’s FPGA-based design! The base boards powerful Xilinx Artix-7 offers plenty of resources to implement advanced image processing functions, enabling superior visual quality while freeing up the CPU to handle other tasks.

Solectrix has over 10 years of experience developing all kinds of standard and customer-specific FPGA modules. Pick one from the following list or challenge us to implement an all new type of processing module specifically for your project!

- Sensor synchronization and I2C control
- Sensor power sequencing
- Color Processing
  - HDR, HQ, high performance
  - Log-based de-mosaicing and defective pixel correction
  - Real-time resizers, split screens, overlays
  - Edge enhancement, noise filter
  - Contrast, tonemap, color correction, AWB
- Image Processing and Analysis
  - Hardware analyzing blocks for real-time adjustments
  - Pattern recognition
  - Stitching
  - 3D/360º processing
- Streaming Server and Interfacing
  - Image and metadata streaming
  - Time stamp generation
  - Image CODECs
- Programmable Power over Coax (PoC)
- Programmable pixel clock for playback modes

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Our IP core expertise

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**Art.No.**  **Software Library**
501664  SX LIB proFRAME Linux x64
501665  SX LIB proFRAME Windows 7 x64
501666  SX LIB camAD Linux
501667  SX LIB camAD Windows 7
500888  SX LIB camAD SYNC
500803  SX LIB CSI-2 RAW Capture/Replay
The System-on-Module approach

System-on-Modules are the state-of-the-art solution for applications in highly technologized areas such as medical technology, the automotive industry, industrial automation, aerospace and others. Their modular approach allows for a high degree of customization on the application hardware side while offering a wide choice of standardized system cores compliant with the respective SoM format.

The need for ultra-compact modules that combine CPU and FPGA led to the launch of the SXoM series, a line of System-on-Module boards by Solectrix. Special cooling solutions are available as accessories.

SXoM advantages

- **State-of-the-art technology**
  SXoMs are based on the latest technology. Profit from our specialists’ research and development know-how!
- **Lower development risk and costs**
  SXoMs offer proven and reliable solutions. Building on ready-to-use SXoMs enables you to reduce your development and project costs.
- **Shorter time-to-market**
  Our SXoMs provide basic design structures. This allows you to focus on the development of the application-specific parts of your product and to achieve a shorter time-to-market.

Applications

<table>
<thead>
<tr>
<th>Motion capturing and analysis</th>
<th>Security and surveillance</th>
<th>Traffic monitoring</th>
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</thead>
<tbody>
<tr>
<td>Medical and scientific imaging</td>
<td>High-end machine vision</td>
<td>Airborne imaging</td>
</tr>
</tbody>
</table>

The SXoM family of products includes the world’s first System-on-Modules (SOMs) based on the Smart Mobility ARCHitecture (SMARC) by SGET that feature CPU and FPGA in one chip.

The two new modules to join the Solectrix System-on-Module family, SXoM MS1-C5 and SXoM MS2-K7, adhere to the SMARC standard and are suited for use in a wide variety of projects. The first applications currently in development for SXoM MS1-C5 are pedestrian recognition and advanced driver assistance systems. The even more powerful SXoM MS2-K7 is used for the processing of 4K video data. Solectrix also offers the SMARC carrier board SXoM CBS2, compatible with SMARC 1.1 and 2.0 modules.

Solectrix is a member of SGET, the Standardization Group for Embedded Technologies. For more information on the SMARC specification please visit www.sget.org
SXoM MS1-C5
System-on-Module compliant with SMARC 1.1 specification

- System-on-Module compliant with SMARC 1.1 specification by SGET
- Ultra-compact form factor: 82 mm × 50 mm
- Powered by Intel/Altera Cyclone V SX SoC 5CSX C2/C4/C5/C6
- Linux board support package (BSP) available on request
- FPGA IP cores and implementation support available on request
- Accessory options:
  - SXoM MS1-C5 heat spreader, Art.No. 500585
  - SXoM MS1-C5 SXC2C7
  - SXoM MS1-C5 SXC4C7
  - SXoM MS1-C5 SXC5C7
  - SXoM MS1-C5 SXC6C7
  - SXoM MS1-C5 SXC2I7
  - SXoM MS1-C5 SXC4I7
  - SXoM MS1-C5 SXC5I7
  - SXoM MS1-C5 SXC6I7

FPGA Fabric Features

<table>
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<tr>
<th>Logic elements</th>
<th>Block memory</th>
<th>DSP blocks</th>
<th>Speed grade / CPU clock frequency</th>
<th>Transceivers</th>
<th>Temperature range</th>
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</thead>
<tbody>
<tr>
<td>25K</td>
<td>1.4 Mbit</td>
<td>36</td>
<td>7 / 800 MHz</td>
<td>6 à 3.125 Gbps</td>
<td>Commercial (-40 to 100 °C)</td>
</tr>
<tr>
<td>40K</td>
<td>2.7 Mbit</td>
<td>84</td>
<td>7 / 800 MHz</td>
<td>6 à 3.125 Gbps</td>
<td>Commercial (-40 to 100 °C)</td>
</tr>
<tr>
<td>85K</td>
<td>3.97 Mbit</td>
<td>87</td>
<td>7 / 800 MHz</td>
<td>6 à 3.125 Gbps</td>
<td>Commercial (-40 to 100 °C)</td>
</tr>
<tr>
<td>110K</td>
<td>5.57 Mbit</td>
<td>112</td>
<td>7 / 800 MHz</td>
<td>6 à 3.125 Gbps</td>
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<td>3.97 Mbit</td>
<td>87</td>
<td>7 / 800 MHz</td>
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</tr>
</tbody>
</table>

CPU Features

<table>
<thead>
<tr>
<th>Dual-core ARM Cortex-A9 MPCore processor, 700 – 925 MHz clock frequency</th>
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</thead>
<tbody>
<tr>
<td>25K – 110K logic elements</td>
</tr>
<tr>
<td>More than 4,000 MIPS (Dhrystone 2.1) for under 1.8 W</td>
</tr>
<tr>
<td>1.4 – 5.6 Mbit block memory</td>
</tr>
<tr>
<td>512 KByte of shared L2 cache</td>
</tr>
<tr>
<td>36 – 112 DSP blocks</td>
</tr>
<tr>
<td>64 KByte of on-chip RAM</td>
</tr>
<tr>
<td>Up to 2 GByte DDR3 SDRAM = 32 bits for the FPGA</td>
</tr>
<tr>
<td>Up to 2 GByte DDR3 SDRAM = 32 bits for the CPU</td>
</tr>
</tbody>
</table>

Further options are available on request.
<table>
<thead>
<tr>
<th>Art.No.</th>
<th>Name</th>
<th>SoC manufacturer part No.</th>
<th>Logic elements</th>
<th>Block memory</th>
<th>DSP blocks</th>
<th>Speed grade / CPU clock frequency</th>
<th>Transceivers</th>
<th>Temperature range</th>
</tr>
</thead>
<tbody>
<tr>
<td>500712</td>
<td>SXoM MS2-K7 7030C2</td>
<td>XC7Z030-2FFG676C</td>
<td>125K</td>
<td>9.3 Mbit</td>
<td>400</td>
<td>2 / 800 MHz</td>
<td>4 to 10.3125 Gbps</td>
<td>Commercial (0 to 85 °C)</td>
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<tr>
<td>500713</td>
<td>SXoM MS2-K7 7035C2</td>
<td>XC7Z035-2FFG676C</td>
<td>275K</td>
<td>17.6 Mbit</td>
<td>900</td>
<td>2 / 800 MHz</td>
<td>4 to 10.3125 Gbps</td>
<td>Commercial (0 to 85 °C)</td>
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<td>350K</td>
<td>19.1 Mbit</td>
<td>900</td>
<td>2 / 800 MHz</td>
<td>4 to 10.3125 Gbps</td>
<td>Commercial (0 to 85 °C)</td>
</tr>
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<td>XC7Z030-2FFG676E</td>
<td>125K</td>
<td>9.3 Mbit</td>
<td>400</td>
<td>2 / 800 MHz</td>
<td>4 to 10.3125 Gbps</td>
<td>Extended (0 to 100 °C)</td>
</tr>
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<td>500721</td>
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<td>XC7Z035-2FFG676E</td>
<td>275K</td>
<td>17.6 Mbit</td>
<td>900</td>
<td>2 / 800 MHz</td>
<td>4 to 10.3125 Gbps</td>
<td>Extended (0 to 100 °C)</td>
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<td>XC7Z045-2FFG676E</td>
<td>350K</td>
<td>19.1 Mbit</td>
<td>900</td>
<td>2 / 800 MHz</td>
<td>4 to 10.3125 Gbps</td>
<td>Extended (0 to 100 °C)</td>
</tr>
</tbody>
</table>

**FPGA Fabric Features**
- Kintex-7 FPGA fabric
- 125K - 350K logic elements
- 9.3 - 19.1 Mbit block memory
- 400 - 900 DSP blocks
- 1 Gbyte DDR3 SDRAM x32 bit for the FPGA

**CPU Features**
- Dual-core ARM Cortex-A9 MPCore processor
- 667 - 1000 MHz clock frequency
- 512 Kbyte of shared L2 cache
- 512 MByte DDR3 SDRAM x32 bit for the CPU

**System-on-Module**
- SXoM MS2-K7
- Compliant with SMARC 2.0 specification by SGET
- Ultra compact form factor: 82 mm × 50 mm
- Powered by Xilinx Zynq Z-7030/7035/7045 SoC
- Linux board support package (BSP) available on request
- FPGA IP cores and implementation support available on request
- Accessory options:
  - SXoM MS2-K7 heat spreader, Art.No. 500768
  - SXoM MS2-K7 heat sink, Art.No. 500769

**Specifications**
- Dual-core ARM Cortex-A9 MPCore processor, 667 – 1000 MHz clock frequency
- 125K - 350K logic elements
- 9.3 - 19.1 Mbit block memory
- 400 - 900 DSP blocks
- 1 Gbyte DDR3 SDRAM x32 bit for the FPGA
- 512 Kbyte of shared L2 cache
- 512 MByte DDR3 SDRAM x32 bit for the CPU
- 1 Gbyte of on-chip RAM

**Features**
- System-on-Module compliant with SMARC 2.0 specification
- Ultra compact form factor: 82 mm × 50 mm
- Powered by Xilinx Zynq Z-7030/7035/7045 SoC
- Linux board support package (BSP) available on request
- FPGA IP cores and implementation support available on request

**Further options are available on request.**
The SXoM CBS2 is a SMARC carrier board compatible with SMARC 1.1 and 2.0 modules.

It provides essential standard interfaces in the form of dual USB and dual Ethernet connectors and an SD card socket. Most of the SMARC connector's signals are led to three separate board-to-board connectors for connection of an application-specific I/O board. As a universal SMARC carrier board, the SXoM CBS2 enables fast software evaluation on your System-on-Module target platform, shortening your development time.

- SMARC interface for SMARC 2.0 (e.g., SXoM MS2-K7) and SMARC 1.1 (e.g., SXoM MS1-C5) modules
- Dual Ethernet interface
- Dual USB interface
- SD Card socket
- 48V power interface on 4-pin Samtec SQT connector
- High-speed interface on 60-pin Samtec LSHM connector
- I/O interface on 100-pin Samtec LSHM connector
- Additional SMARC 1.1 signals (e.g., from SXoM MS1-C5) on 60-pin Samtec LSHM connector
- 4× board-to-board connectors:
  - I2C GPIO expander Maxim MAX7314
  - 9 GPIO lines to 3 on-board RGB LEDs
  - 4 GPIO lines to board-to-board I/O interface
  - 2 GPIO lines to I2C fan controllers
  - 1 GPIO line to I2C temperature sensor
  - 2× I2C fan controller Maxim MAX6650
  - I2C temperature sensor Texas Instruments LM75B
  - I2C EEPROM Atmel AT24C04D
- Battery socket (CR2032) for real-time clock on SMARC module
- 2× fan interface on 3-pin Molex PicoBlade connector
- Board dimensions: 100 mm × 100 mm
Kickstart your SMARC 2.0 development! The SXoM Starter Kit combines a SXoM MS2-K7 SMARC 2.0 module by Solectrix with a conga-SEVAL evaluation carrier board and a full set of accessories by congatec.

The evaluation carrier board provides a wide selection of physical connectors for the standard interfaces featured on the SMARC 2.0 connector. From a matching PSU and customized heat sinks to a DVI display adapter and various cables, all the hardware you need to develop your application for a SMARC 2.0 module is included in this comprehensive starter kit. It also comes with an SD card with a board support package for quick setup of the SXoM MS2-K7 module.

**SXoM Starter Kit**
SMARC 2.0 Starter Kit with SXoM MS2-K7
including module, eval carrier and all accessories

**SXoM EUSB3 200**
8× video capturing and streaming platform based on USB 3.0

SXoM EUSB3 200 is a universal platform for easy connection of up to 8 image sensors via a USB 3.0 client interface.

Its core is a Xilinx Artix-7 FPGA that handles sensor control, image processing and data transfer to the host PC, supporting video streaming as a standard UVC device (USB Video Class). Each sensor is connected with up to 4 lanes of CSI-2 for up to 4K resolution at 60 fps. Each has its own unshared I2C-bus for individual configuration and accurate synchronization via dedicated connectors.

Support for various sensor types, e.g., Sony IMX230 and Sony IMX214.

- SXoM MS2-K7 SMARC 2.0 module feat. Xilinx Zynq Z-7035 SoC with Xilinx 7 FPGA and ARM CPU
- conga-SEVAL evaluation carrier board
- SXoM MS2-K7 heat sink
- SXoM MS2-K7 heat spreader
- Complete cable set
- ATX power supply (180 W)

**FPGA Fabric Features**
- Xilinx Artix-7 FPGA fabric
- 215K logic elements
- 13 Mbit block memory
- 740 DSP slices

**Board Features**
- USB 3.0 client interface on type C receptacle, up to 5.0 Gbit/s
- High-speed expansion connector for accessories like PCIe converter, HDMI output etc.
- Powered via USB receptacle or separate wide voltage range input
- Compact format of 80 × 120 mm
- MicroBlaze soft processor for system control

NEW

SXoM Starter Kit
SMARC 2.0 Starter Kit with SXoM MS2-K7
including module, eval carrier and all accessories

NEW

SXoM EUSB3 200
8× video capturing and streaming platform based on USB 3.0

SXXM
The SXoM CBS2 eNUC 1 is a universal carrier board for SMARC 2.0 modules designed for use in aviation applications. The board provides USB and Gigabit Ethernet interfaces, a PCIe Mini Card slot and options for mass storage. An FMC extension slot enables the connection of an application-specific I/O board to take advantage of the flexibility offered by CPU+FPGA modules like the Solectrix SXoM MS2-K7. The PCB is based on the embedded NUC (eNUC) standard and compatible with the ARINC 836A (miniMRP) form factor.

**Carrier Board for SMARC 2.0 modules**
- FMC extension slot
- PCIe Mini Card slot
- M.2 slot B+M type
- microSD card slot
- USB interface
- Gigabit Ethernet interface
- 9-36 VDC in; 80 W power supply
- PCB based on embedded NUC (eNUC) standard
- Compatible with ARINC 836A form factor
- Operating temperature -10..60 °C
  (out of housing, ext. temperature -20..85 °C on request)
- Accessories available on request: M.2 SSD

**The SXoM EDC eNUC 1 is a power supply board.**

The PCB is based on the embedded NUC (eNUC) standard and compatible with the ARINC 836A (miniMRP) form factor.

**DC/DC module Vicor 500 W**
- Input 270 VDC typ.
- Output 4× 28 V @ 4 A max
- Output over-/undercurrent protection
- Configurable output power sequencing
- Power management monitor over Gigabit Ethernet
- PCB based on embedded NUC (eNUC) standard
- Compatible with ARINC 836A form factor
- Operating temperature -10..50 °C
  (out of housing, ext. temperature -20..85 °C on request)
Then get in touch with our sales people at sales@solectrix.de. They are happy to answer any questions you may have and submit your personal offer.

Found what you were looking for?
Detailed data sheets and reference manuals for our products are available on request or can be found on our website www.solectrix.de.

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With a team of qualified and specialized engineers and technicians, Solectrix considers itself an innovator and independent service provider in the development of high-end electronics solutions.

Solectrix is active in the following markets.

AUTOMOTIVE  IMAGING  MEDICAL  INDUSTRIAL

Our R&D competence
- Hardware
- Software
- FPGA
- Cameras
- System Engineering

Our services
- Consulting
- Analysis
- Specification
- Design
- Verification
- Rapid Prototyping
- Qualification
- Production
- Lifecycle Management
- Support