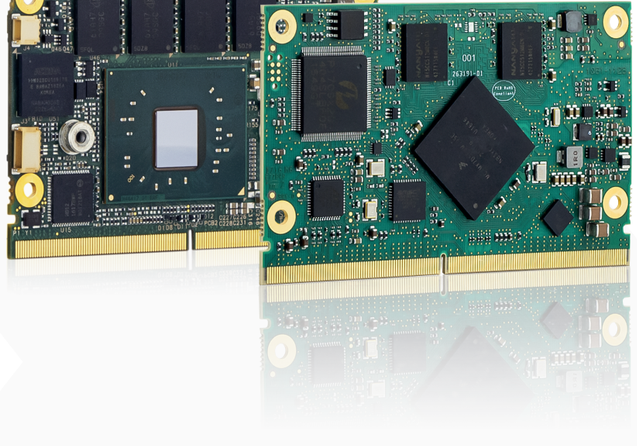
SMARC™ module

Computer-on-Modules Form Factor



SMARC module

Module Standard for x86 and Arm®

Optimized pin-out definition for versatile architectures

Creating Mobile, Embedded, Connected Solutions

Ultra low-power, low profile

Perfect fit for IIoT Applications

High connectivity with USB, PCIe, up to 2x LAN and 2x CAN

kontron

Boards & Modules - SMARC™

SMARC module

Low-power embedded architecture platform for Computer-on-Modules based on Arm® and x86 technology. Perfect fit for mobile, embedded, connected solutions with scalable building blocks. Optimized pin-out definition for versatile architectures. Constructed to withstand harsh industrial environments.

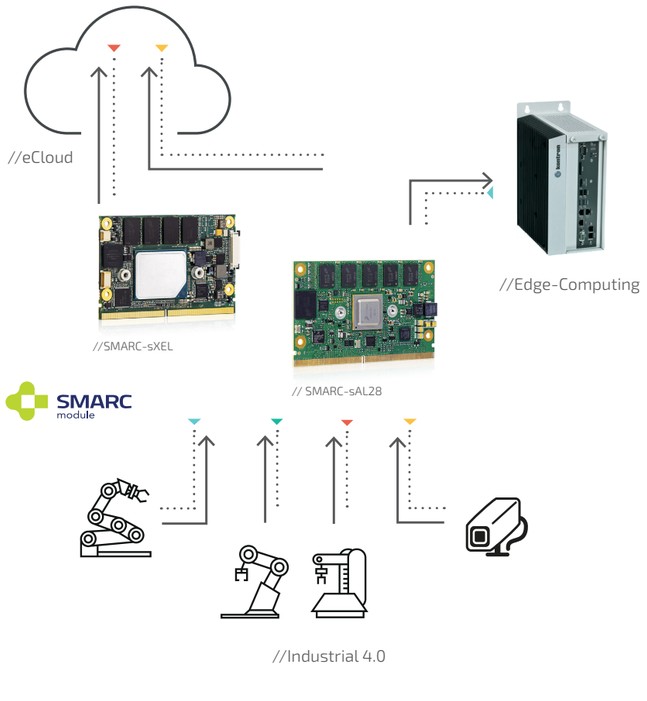
SMARC™ 2.1 Module

A New Specification

SMARC™ 2.1 module introduces a number of additional features as well as a few revision enhancements to the previous 2.0 specification.

At a Glance:

- SerDes signal support for increased Ethernet connectivity
- Additional MDIO interface
- Further GPIOs
- New power and sleep domains
- PCI Express® Clock Request Signals
- Additional Camera Interfaces
- JTAG connector refinement
- MIPI CSI Fill order changes
- Improved documentation



About Kontron

Kontron is a global leader in IoT/Embedded Computing Technology (ECT) and offers individual solutions in the areas of Internet of Things (IoT) and Industry 4.0 through a combined portfolio of hardware, software and services. With its standard and customized products based on highly reliable state-of-the-art technologies, Kontron provides secure and innovative applications for a wide variety of industries. As a result, customers benefit from accelerated time-to-market, lower total cost of ownership, extended product lifecycles and the best fully integrated applications.

For more information, please visit: **www.kontron.com**

About the Intel® Partner Alliance

From modular components to market-ready systems, Intel and the over 1,000+ global member companies of the Intel® Partner Alliance provide scalable, interoperable solutions that accelerate deployment of intelligent devices and end-to-end analytics. Close collaboration with Intel and each other enables Alliance members to innovate with the latest IoT technologies, helping developers deliver first-in-market solutions.

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intel partner Titanium IoT Solutions

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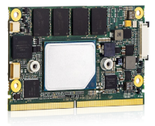
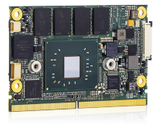
Boards & Module

SMARC™

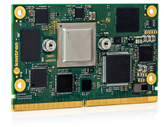


SMARC-sXEL (E2)



SMARC-sXAL(4) (E2)
SMARC-sXAL (E2)

SMARC-sAL28



SMARC-sAMX8X

SMARC-sAMX7

	SMARC-sXEL (E2)	SMARC-sXAL(4) (E2) SMARC-sXAL (E2)	SMARC-sAL28	SMARC-sAMX8X	SMARC-sAMX7
COMPLIANCE	SMARC module 2.1	SMARC 2.0	SMARC 2.1	SMARC 2.0	SMARC 2.0
DIMENSIONS (H x W x D)	82 x 50 mm	82 x 50 mm	82 x 50 mm	82 x 50 mm	82 x 50 mm
CPU	Intel Atom® x6000E Series, Intel® Pentium®, and Intel® Celeron® N and J Series processors	Intel Atom® processor E3900 series, Intel® Celeron® processor N3350 and Intel® Pentium® processor N4200	NXP Dual Cortex A72 LS1028A processor	NXP dual/quad i.MX8X processor	NXP single/dual i.MX7 processor
MAIN MEMORY	Up to 16 GByte LPDDR4 memory down with inband ECC support	Up to 8 GByte ECC DDR3L (SMARC-sXAL) Up to 8 GByte LPDDR4 (SMARC-sXAL4)	up to 8 GByte DDR3L (ECC)	Up to 4 GByte LPDDR4	Up to 2 GByte DDR3
GRAPHICS CONTROLLER	Intel® UHD Gfx Gen11	Intel® HD Gfx Gen9	integrated	integrated	integrated
ETHERNET CONTROLLER	integrated	Intel® I210IT	integrated	1x integrated, 1x on request	integrated
ETHERNET	Up to 3x 1 Gbit LAN (2x GBE0/1 and 1x optional SGMII via SERDES)	1x 1 GB Ethernet (SMARC-sXAL) up to 2x 1 GB Ethernet (SMARC-sXAL4)	up to 2x 1 GByte Ethernet (TSN capable)	up to 2x 1 GByte Ethernet	up to 2x 1 GByte Ethernet
SATA	1x SATA 6 Gb/s	1x SATA 3 Gb/s	-	-	-
FLASH ONBOARD	Up to 64 GByte eMMC	Up to 64 GByte MMC	Up to 64 GByte eMMC	Up to 64 GByte eMMC	Up to 64 GByte eMMC
PCI EXPRESS® / PCI SUPPORT	up to 4x PCIe x1	3x PCIe x1	Up to 2x PCIe x1 or 2x PCIe x2 or 1x PCIe x4	Up to 3x PCIe	1x PCIe with dual core processor up to 3x PCIe (on request)
PANEL SIGNAL	1x HDMI (on request DP), 1x DP++, 1x LVDS dual channel (on request eDP)	1x HDMI (on request DP), 1x DP++, 1x LVDS dual channel (on request eDP)	LVDS dual channel, eDP or DP as BOM option on request	1x LVDS, 1x HDMI, 1x DP	1x LVDS dual channel
USB	2x USB 3.0 (incl. USB 2.0) + 4x USB 2.0, alternatively USB #3 as OTG	2x USB 3.0 (incl. USB 2.0) + 4x USB 2.0, alternatively USB #0 as OTG	up to 6x USB 2.0, 1x USB 3.0	1x USB 3.0, 6x USB 2.0	up to 5x USB 2.0
SERIAL	4x serial interfaces (2x RX / TX only)	4x serial interfaces (2x RX / TX only)	3x serial interfaces (2x RX / TX only)	4x serial interfaces (2x RX / TX only)	4x serial interfaces (2x RX / TX only)
ADDITIONAL INTERFACES	HD Audio and I²S, 5x I²C, 2x SPI, 14x GPIOs	12x GPIO, SDIO, 5x I²C, MIPI-CSI	12x GPIO, SDIO, 3xI2C, 1x CAN	12x GPIO, SDIO, 5x I²C, MIPI-CSI 2x CAN	12x GPIO, SDIO, 5x I²C, MIPI-CSI, 2x CAN
OPERATING SYSTEM	Windows® 10, Enterprise, Windows® 10 IoT, Linux	Windows® 10, Enterprise, Windows 10 IoT, Linux, VxWorks	Yocto Linux	Yocto Linux	Yocto Linux
POWER SUPPLY	3.3 V to 5.25 V wide-range input (5 V recommended)	3V – 5.25 V operates directly from single level Lithium Ion cells or fixed 3.3 V – 5 V power supplies (SMARC-sXAL) 5V only (SMARC-sXAL4)	3 V – 5.25 V operates directly from single level Lithium Ion cells or fixed 3.3 V – 5 V power supplies	3 V – 5.25 V operates directly from single level Lithium Ion cells or fixed 3.3 V – 5 V power supplies	3 V – 5.25 V operates directly from single level Lithium Ion cells or fixed 3.3 V – 5 V power supplies
TEMPERATURE	SMARC-sXEL: Commercial temperature: 0 °C to +60 °C operating, -30 °C to +85 °C non-operating SMARC-sXEL E2: Industrial temperature: -40 °C to +85 °C operating, -40 °C to +85 °C non-operating	SMARC-sXAL(4): Commercial temperature: 0 °C to +60 °C operating, -30 °C to +85 °C non-operating SMARC-sXAL(4) E2: Industrial temperature: -40 °C to +85 °C operating, -40 °C to +85 °C non-operating	Operating: -40 °C to + 85 °C Non-Operating: -40 °C to +85 °C	Operating: -40 °C to 85 °C	Operating: extended consumer -20 °C to + 85 °C Non-Operating: -30 °C to +85 °C
SPECIAL FEATURES	Trusted Platform Module TPM 2.0 Industrial Temperature Grade versions	Trusted Platform Module TPM 2.0 on request, Ind. Temp. Grade versions	Alternate function on PCIe C/D: SXGMII or UXGMII to connect Ethernet bridge phy directly on the carrier (allows up to 5x TSN capable 1GB LAN ports),	-	Security Solution (APPROTECT) on request

Learn more about Kontron SMARC embedded systems visit:
www.kontron.com/products/boards-and-standard-form-factors/smarc/

SMARC™ 2.1 Carrier

SMARC™ Evaluation Carrier

- Evaluation Carrier Board for SMARC 2.1 based Computer-on-Modules
- Broad range of interface options for Design Development flexibility
- Compliant with SMARC 2.1 specification by SGET