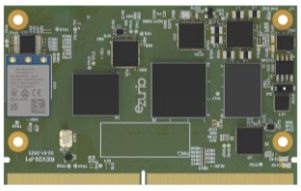
Secure, Smart, Standardized, and Connected IoT: Powerful NXP Edge Processing with Wi-Fi 6 or Wi-Fi 6E

Our customers asked for a high performance, robust SoM that simplifies their BOM, has reliable connectivity, uses a standard form factor, and is globally certified. One with multiple software options, a proven security architecture, long term software support, and security fixes.

Our new Nitrogen8M Plus SMARC is powered by **NXP's innovative i.MX 8M Plus** processor, NXP **PMIC PCA9450,** and our Sona Wi-Fi 6 or 6E and Bluetooth 5.4 wireless module families based on leading NXP and Infineon solutions, high performance LPDDR4 RAM, and eMMC storage. We combine this with our common SMARC carrier board; together they serve as a single board computer (SBC) that can speed your product to market. Alternately, work with us to create a custom carrier that fits your mechanical, environmental, temperature, and interface requirements.

- **Powerful Heterogenous Multiprocessing:** Up to 1.8 GHz quad-core Cortex-A53 MPU and 800 MHz Cortex-M7 MCU allow you to run Linux and an RTOS on dedicated, hardware-firewalled subsystems.
- **Dedicated Machine Learning:** High-performance edge machine learning via an integrated neural processing unit, up to 2.3 TOPS.
- **Diverse Interfaces:** Multiple display, network, data, audio, camera.
- **SMARC 2.2 Standard Form Factor: 82mm x 50mm** SMARC edge connector form factor which includes **onboard ethernet PHYs and a USB hub controller**. One design supports multiple processor, memory, and wireless configurations.
- **Hardware Upgrade Roadmap:** Build a product design that can easily be upgraded to the latest processors and wireless options as future Ezurio based on the SMARC standard are released.
- **Advanced Common Carrier/Development Board:** Display, camera, audio, Ethernet, USB, PCI-Express, CAN, I2C, SPI, UART, and more. Use in development, as an SBC equivalent in a product, or as reference designs for your carrier board design.



GOLD PARTNER NXP

Infineon Premium Partner

- **Multiple options** for **Wi-Fi 6 or 6E** (802.11ax) and **Bluetooth 5.4**
  - Sona IF573 (**Infineon CYW55573**) tri-band Wi-Fi 6E and Bluetooth 5.4
  - Sona NX611 (**NXP IW611**) dual-band Wi-Fi 6 and Bluetooth 5.4
- **Operating Temp:** Commercial (0° to +70 °C) / Industrial Rating (-40° to +85 °C)
- **Multiple high performance memory options**:

2GB LPDDR4 / 16GB eMMC	4GB LPDDR4 / 16GB eMMC	8GB LPDDR4 / 16GB eMMC (MOQ required)

- Extensive range of **pre-certified antennas** for optional Sona wireless modules
- **US based manufacturing with Global Options:** Assembled in USA for local customer base and US market needs. Global manufacturing capability as part of Laird Connectivity footprint, growing reach to EMEA & APAC regions
- **Diverse Software and BSP Options:** Choose from Yocto Linux / Buildroot Linux / Android / Zephyr RTOS / FreeRTOS (Cortex-M7)
- **Secure and Encrypted Boot, Secure Enclave, and Secure File Storage:** Robust, secure, and optionally encrypted boot mechanism to ensure only trusted software boots on your device. Optionally store and use secure keys, certificates, and credentials in run-time isolated trusted environment.
- **Power Efficient:** NXP PMIC, power optimized LPDDR4 and eMMC memory, core shut off, clock/voltage scaling, low power interfaces, power optimized single stream Wi-Fi mode enable highly optimized power consumption
- **Long term hardware availability and software support:** Ezurio's products are specifically designed to meet the needs of the industrial and medical markets, which typically require 10 year or more product lifecycles. Long-term software support includes LTS Yocto Linux and Zephyr RTOS support with vulnerability remediation.

Key Features

Reliable Connectivity: Optional Wi-Fi 6/6E and BT5.3/5.4
Excellent Wi-Fi and BT Classic / LE connectivity in difficult environments, plus enterprise Wi-Fi support via WPA3-Enterprise for more secure and robust connections.

ML, Graphics, Video, Vision, and Audio – Up to 3 Displays
2.3 TOPS Machine Learning/Neural Processing Unit, up to 1200p60 or 4Kp30 displays, 2 shader GPU, 1080p60 multi codec encode and decode VPU, 2 MIPI-CSI camera interfaces, dedicated Image Signal Processing up to 12 MP, HiFi4 audio DSP

Secure Enclave and Secure Boot Powered by I.MX 8M Plus
Dedicated on-board security hardware, secure boot Linux, and high-performance and flexible secure storage system for passwords, certificates, and data storage.

Robust Software and Speed to Market
Choose from Yocto Linux, Buildroot Linux and Android for the Cortex-A53s; Zephyr RTOS, FreeRTOS for the Cortex-M7

Global Radio Approvals
Carries several modular FCC, IC, CE, UKCA, RCM, MIC, KC, and Bluetooth SIG approvals.

Personal Support from Design to Manufacture
Our industry-renowned support and field application engineering team is passionate about helping you speed your design to market.

Application Areas

- **Smart Buildings and Appliances**
- **Touchscreens and Displays**
- **Industrial IoT, Vision Systems**
- **Food and Beverage**
- **Medical Devices**

Interested in our Nitrogen8M Plus SMARC?
Visit www.ezurio.com/nitrogen8m-plus-smarc

Specifications

Category	Feature	Specification
Processors	Microprocessor	4x Cortex®-A53 cores @ up to 1.8 GHz
	Microcontroller	1x Cortex®-M7 core @ 800 MHz
	Audio	Tensilica® HiFi 4 DSP
	Graphics	GC7000UL with 2 shaders for 3D and GC520L for 2D
	Machine Learning	Neural Processing Unit (NPU) with 2.3 TOP/s
Memory	RAM	2GB and 4GB. 8GB with qualifying MOQ. *(For custom sizes, please contact Sales)*
	Storage	16GB. *(For custom sizes, please contact Sales)*
Machine Learning	Neural Processing Unit	• Keyword detect, noise reduction, beamforming • Speech recognition (i.e. Deep Speech 2) • Image recognition (i.e. ResNet-50)
Graphics and Video	Graphics Processing Unit	• 166 million triangles/sec • 1.0 giga pixel/sec • 16 GFLOPs 32-bit • OpenGL ES 1.1, 2.0, 3.0, OpenCL 1.2, Vulkan • 2D acceleration
	Video Processing Unit	**Video Decode** • 1080p60 HEVC/H.265 Main, Main 10 (up to level 5.1) • 1080p60 VP9 Profile 0, 2 • 1080p60 VP8 • 1080p60 AVC/H.264 Baseline, Main, High decoder **Video Encode** • 1080p60 AVC/H.264 encoder • 1080p60 HEVC/H.265 encoder
	Display Interfaces	• 1x MIPI DSI, up to UWHD and WUXGA • 1x LVDS Tx, up to 1920x1080p60 • 1x HDMI 2.0a Tx, up to 4kp30
Vision	Camera	1x 4-lane MIPI CSI, 1x 2-lane MIPI CSI
	Image Signal Processor	375 Mpixel/s HDR ISP supporting configurations, such as 12MP@30fps, 4kp45, or 2x 1080p80
Audio	Audio Interfaces	• 2x I2S (Optionally 1 as HDA) • eARC/ARC (HDMI) • ASRC
Peripherals	Input/Output	• 1x PCIe Gen3 1-Lane Dual Mode with PHY • 2x USB 3.0/2.0 with PHY • 2x USB 2.0 with PHY • 2x Gbit Ethernet with IEEE® 1588, AVB (One also supports TSN) • 2x CAN (Optionally CAN-FD on I-Temp) • 3x UART 5 Mbit/s • 5x I2C • 2x SPI • 1x SDIO 3.0/eMMC 5.1 • 14x GPIO
Optional Wireless Specification	Wi-Fi	Wi-Fi 6 or Wi-Fi 6E
	Frequency	Dual-Band 2.4GHz & 5GHz or Tri-Band 2.4GHz, 5GHZ & 6GHz
	Bluetooth	Bluetooth 5.3 or Bluetooth 5.4
Supply Voltage		5 V
Physical	Dimensions	SMARC 2.2 Standard - 82mm x 50mm
Environmental	Temp Range	0°C to +70°C (Commercial) and -40° to +85 °C (Industrial)
Miscellaneous	Lead Free	Lead-free and RoHS-compliant
	Carrier Board	Carrier board, accessories, and evaluation software
Qualifications	Bluetooth® SIG	Bluetooth SIG Qualified Listing
Regulatory	Approvals	FCC/IC/CE/MIC/RCM

For full specifications on the Nitrogen8M Plus SMARC, please see the appropriate datasheet.

Ordering Information

Part	Description
N8MP_SMARC_SOM_2r16e	Nitrogen8M PLUS SMARC: i.MX8M Quad Plus / 2GB / 16GB eMMC
N8MP_SMARC_SOM_2r16e_i	Nitrogen8M PLUS SMARC: i.MX8M Quad Plus / 2GB / 16GB eMMC / -40 to +85°C
N8MP_SMARC_SOM_4r16e	Nitrogen8M PLUS SMARC: i.MX8M Quad Plus / 4GB / 16GB eMMC
N8MP_SMARC_SOM_4r16e_i	Nitrogen8M PLUS SMARC: i.MX8M Quad Plus / 4GB / 16GB eMMC / -40 to +85°C
N8MP_SMARC_SOM_8r16e	Nitrogen8M PLUS SMARC: i.MX8M Quad Plus / 8GB / 16GB eMMC
N8MP_SMARC_SOM_8r16e_i	Nitrogen8M PLUS SMARC: i.MX8M Quad Plus / 8GB / 16GB eMMC / -40 to +85°C
N8MP_SMARC_SOM_2r16e_NX611_1M	Nitrogen8M PLUS SMARC: i.MX8M Quad Plus / 2GB / 16GB eMMC / NX611
N8MP_SMARC_SOM_2r16e_NX611_1M_i	Nitrogen8M PLUS SMARC: i.MX8M Quad Plus / 2GB / 16GB eMMC / NX611 / -40 to +85°C
N8MP_SMARC_SOM_4r16e_NX611_1M	Nitrogen8M PLUS SMARC: i.MX8M Quad Plus / 4GB / 16GB eMMC / NX611
N8MP_SMARC_SOM_4r16e_NX611_1M_i	Nitrogen8M PLUS SMARC: i.MX8M Quad Plus / 4GB / 16GB eMMC / NX611 / -40 to +85°C
N8MP_SMARC_SOM_8r16e_NX611_1M	Nitrogen8M PLUS SMARC: i.MX8M Quad Plus / 8GB / 16GB eMMC / NX611
N8MP_SMARC_SOM_8r16e_NX611_1M_i	Nitrogen8M PLUS SMARC: i.MX8M Quad Plus / 8GB / 16GB eMMC / NX611 / -40 to +85°C
N8MP_SMARC_SOM_2r16e_IF573_3M	Nitrogen8M PLUS SMARC: i.MX8M Quad Plus / 2GB / 16GB eMMC / IF573
N8MP_SMARC_SOM_2r16e_IF573_3M_i	Nitrogen8M PLUS SMARC: i.MX8M Quad Plus / 2GB / 16GB eMMC / IF573 / -40 to +85°C
N8MP_SMARC_SOM_4r16e_IF573_3M	Nitrogen8M PLUS SMARC: i.MX8M Quad Plus / 4GB / 16GB eMMC / IF573
N8MP_SMARC_SOM_4r16e_IF573_3M_i	Nitrogen8M PLUS SMARC: i.MX8M Quad Plus / 4GB / 16GB eMMC / IF573 / -40 to +85°C

Part	Description
N8MP_SMARC_SOM_8r16e_IF573_3M	Nitrogen8M PLUS SMARC: i.MX8M Quad Plus / 8GB / 16GB eMMC / IF573
N8MP_SMARC_SOM_8r16e_IF573_3M_i	Nitrogen8M PLUS SMARC: i.MX8M Quad Plus / 8GB / 16GB eMMC / IF573 / -40 to +85°C
450-00238	Universal Heatsink for SMARC
SMARC_CAR	Universal Carrier Board Kit – Includes, antennas, power supply, DB9 cable
SMARC_CAR_BRD	Universal Carrier Board – Board Only (Note - SOM sold separately)

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