

## SECURE, SMART, STANDARDIZED, AND CONNECTED IOT: POWERFUL NXP EDGE PROCESSING WITH WI-FI 5 AND BLUETOOTH 5.2

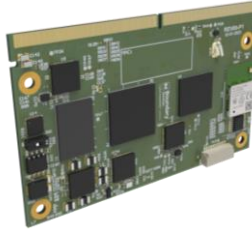


ASSEMBLED IN THE USA

Featuring **NXP i.MX 8M Plus**  
and **Sterling-LWB5+ (Infineon CYW4373E)**

**Up to 1.8 GHz quad-core Cortex-A53**  
and **800 MHz Cortex-M7**

**Wi-Fi 5 (802.11ac) and Bluetooth 5.2**



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 **Sterling LWB5+ Wi-Fi 5 / Bluetooth 5.2** radio based on **Infineon's CYW4373E**, 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 microprocessor and 800 MHz Cortex-M7 microcontroller 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, delivering up to 2.3 TOPS.
- **Diversity of Interfaces:** Multiple display, network, data, audio and camera interfaces.
- **SMARC 2.1.1 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 Laird Connectivity SOMs 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.

- **Wi-Fi 5 (802.11ac) and Bluetooth 5.2 Classic & Low Energy (LE)**
- **Operating Temperature Range**
  - Commercial Rating (0° to +70 °C)
  - Industrial Rating (-40° to +85 °C)
- **Multiple high performance memory options:**

2GB LPDDR4 /	4GB LPDDR4 /	8GB LPDDR4 /
16GB eMMC	16GB eMMC	16GB eMMC (MOQ required)
- Extensive range of **pre-certified antennas** for Sterling-LWB5+
- **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 Board Support Options:** Choose from Yocto Linux/Buildroot Linux/Android/Ubuntu for Cortex-A53s, Zephyr RTOS/FreeRTOS for the 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:** Laird Connectivity'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.

## FEATURES AT A GLANCE



### RELIABLE CONNECTIVITY: WI-FI 5 AND BT 5.2

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, Android, and Ubuntu for the Cortex-A53s, Zephyr RTOS and 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

## KEY SPECIFICATIONS

CATEGORY	FEATURE	SPECIFICATION
<b>Processors</b>	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
<b>Memory</b>	RAM	2GB and 4GB. 8GB with qualifying MOQ. <i>(For custom sizes, please contact Sales)</i>
	Storage	16GB. <i>(For custom sizes, please contact Sales)</i>
<b>Machine Learning</b>	Neural Processing Unit	<ul style="list-style-type: none"> <li>Keyword detect, noise reduction, beamforming</li> <li>Image recognition (i.e. ResNet-50)</li> <li>Speech recognition (i.e. Deep Speech 2)</li> </ul>
<b>Graphics and Video</b>	Graphics Processing Unit	<ul style="list-style-type: none"> <li>166 million triangles/sec</li> <li>16 GFLOPs 32-bit</li> <li>2D acceleration</li> <li>1.0 giga pixel/sec</li> <li>OpenGL ES 1.1, 2.0, 3.0, OpenCL 1.2, Vulkan</li> </ul>
	Video Processing Unit	<b>Video Decode</b> <ul style="list-style-type: none"> <li>1080p60 HEVC/H.265 Main, Main 10 (up to level 5.1)</li> <li>1080p60 VP9 Profile 0, 2</li> <li>1080p60 VP8</li> <li>1080p60 AVC/H.264 Baseline, Main, High decoder</li> </ul> <b>Video Encode</b> <ul style="list-style-type: none"> <li>1080p60 AVC/H.264 encoder</li> <li>1080p60 HEVC/H.265 encoder</li> </ul>
	Display Interfaces	<ul style="list-style-type: none"> <li>1x MIPI DSI, up to UWHD and WUXGA</li> <li>1x HDMI 2.0a Tx, up to 4kp30</li> <li>1x LVDS Tx, up to 1920x1080p60</li> </ul>
<b>Vision</b>	Camera	<ul style="list-style-type: none"> <li>1x 4-lane MIPI CSI</li> <li>1x 2-lane MIPI CSI</li> </ul>
	Image Signal Processor	375 Mpixel/s HDR ISP supporting configurations, such as 12MP@30fps, 4kp45, or 2x 1080p80
<b>Audio</b>	Audio Interfaces	<ul style="list-style-type: none"> <li>2x I2S (Optionally 1 as HDA)</li> <li>ASRC</li> <li>eARC/ARC (HDMI)</li> </ul>
<b>Peripherals</b>	Input/Output	<ul style="list-style-type: none"> <li>1x PCIe Gen3 1-Lane Dual Mode with PHY</li> <li>3x UART 5 Mbit/s</li> <li>2x USB 3.0/2.0 with PHY</li> <li>5x I2C</li> <li>2x USB 2.0 with PHY</li> <li>2x SPI</li> <li>2x Gbit Ethernet with IEEE® 1588, AVB (One also supports TSN)</li> <li>1x SDIO 3.0/eMMC 5.1</li> <li>2x CAN (Optionally CAN-FD on I-Temp)</li> <li>14x GPIO</li> </ul>
<b>Wireless Specification</b>	Wi-Fi	Wi-Fi 5 (802.11ac)
	Frequency	Dual-Band 2.4GHz & 5GHz
	Bluetooth	Bluetooth 5.2
	Transmit Power	+18 dBm (maximum)
	Antenna Options	MHF4 connector for external antenna
	Raw Data Rates (Air)	Wi-Fi 5 433.3Mbit/s - MCS9, 80MHz, 256QAM, SGI
<b>Key Wi-Fi Features</b>	Wi-Fi 5 (802.11ac)	<ul style="list-style-type: none"> <li>IEEE 802.11 a/b/g/n/ac</li> <li>OFDM</li> <li>20, 40 &amp; 80MHz bandwidth support</li> </ul>
<b>Key Bluetooth Features</b>	Bluetooth V	<ul style="list-style-type: none"> <li>Classic Bluetooth – BR / EDR</li> <li>Up to 7 Bluetooth LE connections</li> <li>Central / Peripheral Modes</li> <li>LE Secure Connections</li> </ul>
<b>Supply Voltage</b>		5 V
<b>Physical</b>	Dimensions	SMARC 2.1.1 Standard - 82mm x 50mm
<b>Environmental</b>	Temp Range	0°C to +70°C (Commercial) and -40° to +85 °C (Industrial)
<b>Miscellaneous</b>	Lead Free	Lead-free and RoHS-compliant
	Carrier Board	Carrier board, accessories, and evaluation software
<b>Qualifications</b>	Bluetooth® SIG	Bluetooth SIG Qualified Listing
<b>Regulatory</b>	Approvals	FCC/IC/CE/MIC/RCM

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

Part #	Description
N8MP_SMARC_SOM_2r16eWB	SMARC SOM: i.MX8M Quad Plus / 2GB / 16GB eMMC / LWB5+
N8MP_SMARC_SOM_4r16eWB	SMARC SOM: i.MX8M Quad Plus / 4GB / 16GB eMMC / LWB5+
N8MP_SMARC_SOM_2r16eWB_i	SMARC SOM: i.MX8M Quad Plus / 2GB / 16GB eMMC / LWB5+ / Industrial Temp
N8MP_SMARC_SOM_4r16eWB_i	SMARC SOM: i.MX8M Quad Plus / 4GB / 16GB eMMC / LWB5+ / Industrial Temp
N8MP_SMARC_SOM_8r16eWB	SMARC SOM: i.MX8M Quad Plus / 8GB / 16GB eMMC / LWB5+ (MOQ requirements)
SMARC_CAR_BRD	Universal Carrier Board - SMARC (Note - SOM sold separately)

Boundary Devices' products are subject to standard [Terms & Conditions](#).