# NXP i.MX 8M Plus for Industry 4.0 & Beyond

**conga-SMX8-Plus**

- **NXP i.MX 8M Plus** 14nm FinFET processor series
- 4-core ARM Cortex-A53 / Cortex-M7 + NPU
- Enhanced AI, Machine Learning and Vision capabilities featuring NPU and integrated camera ISP's
- Ultra low power architecture with 2-5W
- Extended longevity up to 15 years
- Temperature range up to -40°C .. +85°C

## Form factor
SMARC Specification 2.1

## CPU SoC
NXP i.MX 8M Plus Processor Cores

<table>
<thead>
<tr>
<th>i.MX 8M Plus Quad (consumer)</th>
<th>i.MX 8M Plus Quad (industrial)</th>
</tr>
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<tbody>
<tr>
<td>ARM Cortex-A53 4x @ 1.8 GHz 64bit</td>
<td>ARM Cortex-M7 1x @ 800MHz</td>
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<tr>
<td>ARM Cortex-A53 4x @ 1.6 GHz 64bit</td>
<td>ARM Cortex-M7 1x @ 800MHz</td>
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</table>

## DRAM
Up to 6 GByte onboard LPDDR4 memory | 4000 MT/s | inline ECC

## Ethernet
2x Gbit Ethernet with IEEE 1588 Support (1x with TSN support)

## I/O Interfaces
- 1x dual-role USB 2.0 | 2x USB 2.0 | 2x USB 3.0 | 1x SDIO 3.0 | 1x PCIe 3.0 | 2x 1P | 1x SPI
- 4x UART (2x with Handshake) | 2x CAN FD | 1x GPIO | optional soldered M.2 1216 WiFi/8T

## Mass Storage
eMMC 5.1 up to 128 GByte

## Sound
2x i²S | HiFi 4 DSP

## Graphics
Integrated in SoC | GC7000UL 3D graphics with 2 high performance vec4 shaders | GC520L 2D graphic | supports up to 2x1080p60 or 1x4kp30 display resolution | Up to 3 independent displays
- VPU up to 1080p60 H.265/H.264 decoding and encoding | OpenGL ES 3.1 | Vulcan VX extensions | OpenCL 1.2 FP | OpenVG 1.1

## Video Interfaces
- 1x dual channel 24-bit LVDS | 1x HDMI 2.0a | 1x MIPI-DSI 4-lane shared with second LVDS channel
- 2x MIPI-CSI 4-lanes | 2x integrated Image Signal Processor (ISP) for cameras with up to 12 MP resolution

## Features
- Watchdog Timer | Cortex-A53 Console | optional JTAG debug interface | High Precision Real Time Clock
- Neural Processing Unit (NPU) with up to 2.3 TOPS | NXP eIQ ML SW tools and libraries

## Boot Loader
U-Boot boot loader

## Operating Systems
Linux, Yocto Project | Android

## Security
- Cryptographic Acceleration and Assurance Module | Resource Domain Controller | ARM® TrustZone®
- High Assurance Boot support | SHE, Encryption Engine AES-128, AES-256, 3DES, RC4, RSA4096, TRNG
- SHA-1, SHA-2, SHA-256, MD-5 | RSA-1024, 2048, 3072, 4096 and secure key storage | side channel attack resistance

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## Power Consumption
- Low power Cortex-A53 / Cortex-M7 | typ. application 2-6W @ 5V

## Temperature Range
- Operating Temperature Range: 0 to +60°C commercial grade | -40 to +85°C industrial grade
- Storage Temperature Range: -40 to +85°C

## Humidity
- Operating: 10 - 90% r. H. non cond. | Storage: 5 - 95% r. H. non cond.

## Size
82 x 50 mm (3.23” x 1.97”)

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<th>Article</th>
<th>PN</th>
<th>Description</th>
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<tr>
<td>conga-SMX8-Plus/QC-4G eMMC16</td>
<td>051300</td>
<td>SMARC 2.1 module with low-power 14nm NXP i.MX 8M Plus Quad processor. Features 4x ARM Cortex-A53 @ 1.8GHz +1x ARM Cortex-M7 + NPU, 4GB onboard LPDDR4 memory and 16GB onboard eMMC. Commercial grade temperature range from 0°C to 60°C.</td>
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<td>conga-SMX8-Plus/I-QC-4G eMMC16</td>
<td>051320</td>
<td>SMARC 2.1 module with low-power 14nm NXP i.MX 8M Plus Quad processor. Features 4x ARM Cortex-A53 @ 1.6GHz +1x ARM Cortex-M7 + NPU, 4GB onboard LPDDR4 memory and 16GB onboard eMMC. Commercial grade temperature range from -40°C to 85°C.</td>
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<tr>
<td>conga-SMX8-Plus/I-QC-2G eMMC16</td>
<td>051321</td>
<td>SMARC 2.1 module with low-power 14nm NXP i.MX 8M Plus Quad processor. Features 4x ARM Cortex-A53 @ 1.6GHz +1x ARM Cortex-M7 + NPU, 2GB onboard LPDDR4 memory and 16GB onboard eMMC. Commercial grade temperature range from -40°C to 85°C.</td>
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<tr>
<td>conga-SMX8-Plus/CSP-B</td>
<td>051350</td>
<td>Passive cooling solution for SMARC module conga-SMX8-Plus with NXP i.MX 8M Plus ARM processor. All standoffs are with 2.7mm bore hole.</td>
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<tr>
<td>conga-SMX8-Plus/HSP-B</td>
<td>051351</td>
<td>Heat spreader solution for SMARC module conga-SMX8-Plus with NXP i.MX 8M Plus ARM processor. All standoffs are with 2.7mm bore hole.</td>
</tr>
<tr>
<td>SMARC/CSA Adapter</td>
<td>050060</td>
<td>Active cooling solution adapter for SMARC modules used in combination with module heat spreader.</td>
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<tr>
<td>conga-SEVAL</td>
<td>007010</td>
<td>Evaluation carrier board for SMARC modules.</td>
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<tr>
<td>conga-SMC1/SMARC-ARM</td>
<td>020750</td>
<td>3.5” carrier board for congatec SMARC modules based on NXP i.MX ARM architecture.</td>
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