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

# conga-SMX8-Plus


- NXP i.MX 8M Plus 14nm processor series with ARM 4-Core Cortex-A53 / Cortex-M7 + NPU
- Enhanced AI, Machine Learning and Vision capabilities featuring NPU and integrated camera ISP's
- Ultra low power architecture with 2-6W
- Support for up to 3 independent displays
- Extended longevity up to 15 years
- Temperature range up to -40°C .. +85°C

SMARC module

| | | | | | |
|---|---|---|---|---|---|
| **Form factor** | SMARC Specification 2.1 | | | | |
| **CPU SoC** | **NXP i.MX 8M Plus Processor Cores** | | | | |
| | | **ARM Cortex-A53** | **ARM Cortex-M7** | **NPU** | **GPU** |
| | i.MX 8M Plus Quad (consumer) | 4x @ 1.8 GHz 64bit | 1x @ 800MHz | up to 2.3 TOPS | GC7000UL/GC520L |
| | i.MX 8M Plus Quad (industrial) | 4x @ 1.6 GHz 64bit | 1x @ 800MHz | up to 2.3 TOPS | GC7000UL/GC520L |
| **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 $I^2C$ \| 1x SPI<br>4x UART (2x with Handshake) \| 2x CAN FD \| 14x GPIO \| optional soldered M.2 1216 WiFi/BT | | | | |
| **Mass Storage** | eMMC 5.1 up to 128 GByte | | | | |
| **Sound** | 2x $I^2S$ \| 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<br>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<br>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 | | | | |
| **AI & Machine Learning** | Neural Processing Unit (NPU) with up to 2.3 TOPS \| NXP eIQ ML SW tools and libraries | | | | |
| **Security** | Cryptographic Acceleration and Assurance Module \| Resource Domain Controller \| ARM® TrustZone®<br>High Assurance Boot support \| SHE, Encryption Engine AES-128, AES-256, 3DES, RC4, RSA4096, TRNG<br>SHA-1, SHA-2, SHA-256, MD-5 \| RSA-1024, 2048, 3072, 4096 and secure key storage \| side channel attack resistance | | | | |
| **Boot Loader** | U-Boot boot loader | | | | |
| **Operating Systems** | Linux, Yocto Project \| Android | | | | |
| **Power Consumption** | Low power Cortex-A53 / Cortex-M7 \| typ. application 2-6W @ 5V | | | | |
| **Temperature Range** | Operating Temperature Range: | 0 to +60°C commercial grade<br>-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") | | | | |

NXP GOLD PARTNER

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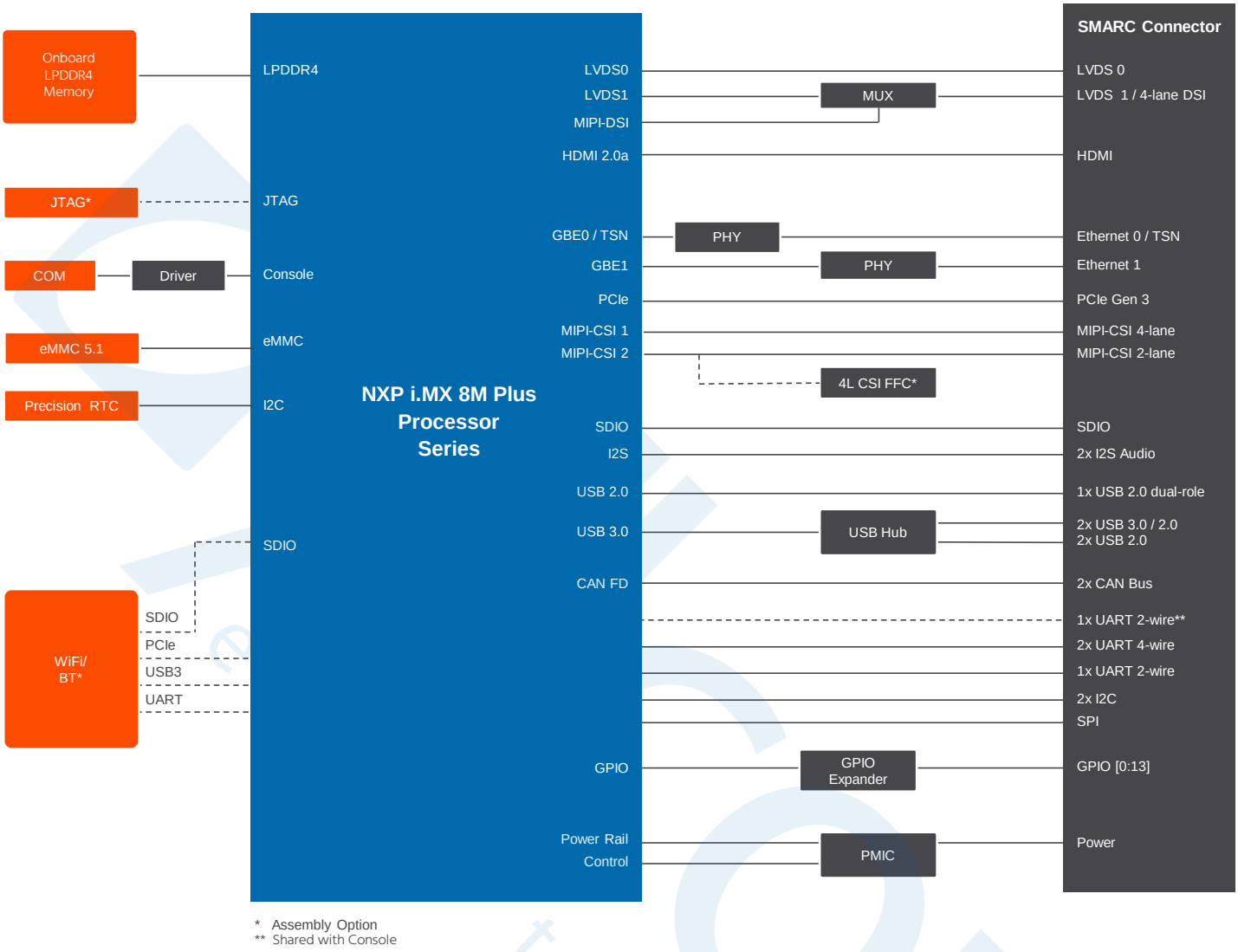
# conga-SMX8-Plus | Block Diagram




* Assembly Option
** Shared with Console

# conga-SMX8-Plus | Order Information

| Article | PN | Description |
|---|---|---|
| conga-SMX8-Plus/i-QC-NPU-4G eMMC16 | 051320 | 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. Industrial grade temperature range from -40°C to 85°C. |
| conga-SMX8-Plus/i-QC-NPU-2G eMMC16 | 051321 | 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. Industrial grade temperature range from -40°C to 85°C. |
| conga-SMX8-Plus/i-QC-NPU-4G eMMC16 AW-CM276NF | 051322 | SMARC 2.1 module with low-power 14nm NXP i.MX 8M Plus Quad processor. Features 4x ARM Cortex-A53 @1.6GHz + NPU +1x ARM Cortex-M7, 4GB onboard LPDDR4 memory and 16GB onboard eMMC. With AzureWave AW-CM276NF onboard Wifi/BT module. Extended temperature range from -25°C to 80°C. |
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| conga-SMX8-Plus/CSP-B | 051350 | 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. |
| conga-SMX8-Plus/HSP-B | 051351 | 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. |
| SMARC/CSA Adapter | 050060 | Active cooling solution adapter for SMARC modules used in combination with module heat spreader. |
| | | |
| conga-SEVAL | 007010 | Evaluation carrier board for SMARC modules. |
| conga-SMC1/SMARC-ARM | 020750 | 3.5" carrier board for congatec SMARC modules based on NXP i.MX ARM architecture. |


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