



Endless ways to the future

PRODUCT  
GUIDE **ON**  
**22**

**SOMs and Single Board Computers**











PRODUCT GUIDE

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## BECOME INSPIRED BY SECO EXPERTISE IN DIVERSE APPLICATIONS

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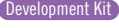


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# SECO

## Endless ways to the future

### MISSION

We bring together technologies and skills to satisfy new needs and opportunities

### VISION

We exist to open up the world to innovation

### VALUES

Passion  
Dynamism  
Respect

## ABOUT SECO

With over 40 years delivering high-tech electronics, SECO offers cutting-edge embedded computing, HMI, communications gateway, custom packaged product, and IoT software solutions through worldwide engineering design, manufacturing, and technical support excellence.



**Multi-decade experience**  
at the forefront  
of innovation



**Global**  
footprint



We continuously  
**add value**  
to our products



Rapid organic **growth**  
supported by a  
quality **M&A strategy**



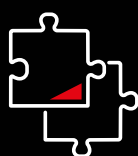
**~800 people**



**250+ R&D people**  
of which 150+ in AI  
algorithm development

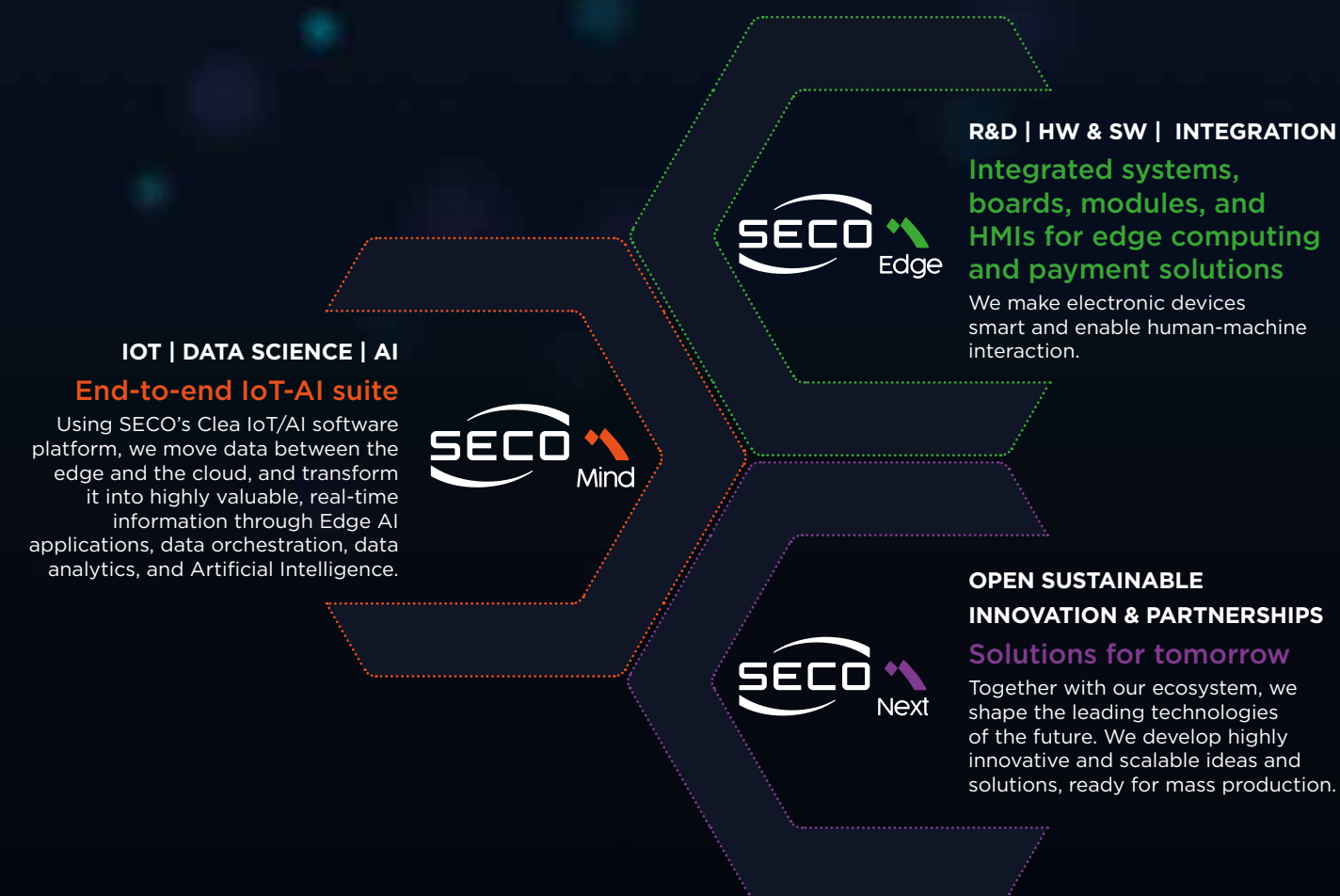


**>€15m**  
R&D investments



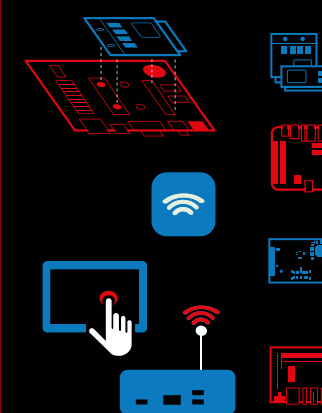
**9 R&D centers**  
**5** production plants

## SECO OFFERS

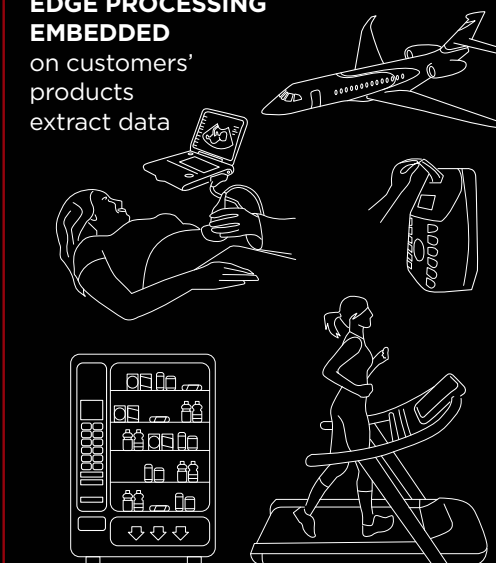


## HOW WE ADDRESS THE NEED FOR DIGITALIZATION FROM EDGE TO AI

### EDGE COMPUTING (Edge platforms, semi-custom, full custom) and **PAYMENT SOLUTIONS**



### EDGE PROCESSING EMBEDDED on customers' products extract data



### ALL-IN-ONE SOFTWARE PLATFORM Real-time operational insights Optimized decision making

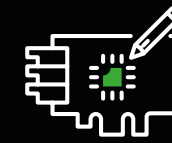






## KNOW - HOW

### DESIGN



Decades of leading-edge embedded computing design incl. hardware and software

### MANUFACTURING



Lean manufacturing employed to reduce waste and accelerate the time to market

### SYSTEMS



Design and integration of embedded computers with video interfaces and enclosures



Analysis & Design



FPGA Design



BIOS Engineering & Development



Hardware Engineering & Development



Software Development



Mechanical Engineering & Development



Signal Integrity



Drivers Engineering & Development



BSP



Firmware Development



Validation & Verification



Thermal Analysis

## PRODUCTS & SERVICES

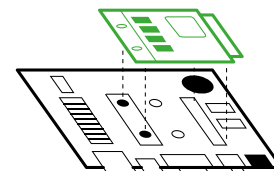
### OFF-THE-SHELF PRODUCTS

#### MODULAR SOLUTIONS



### SEMI-CUSTOM SOLUTIONS

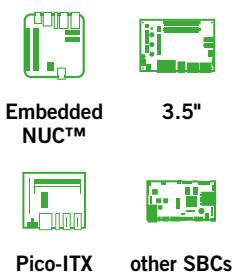
#### CUSTOM CARRIER BOARDS + MODULAR SOLUTIONS



### FULL-CUSTOM SOLUTIONS

Custom-designed circuitry, software, and enclosures to meet unique product requirements.

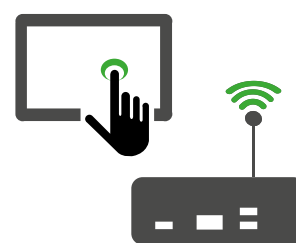
#### SINGLE BOARD COMPUTERS



#### PAYMENT SYSTEMS



#### HMI SOLUTIONS AND FANLESS EMBEDDED COMPUTERS



### CUSTOMIZED COMPUTING PLATFORMS

Design review | Off-the shelf SBC customization | Carrier board design for modular computing platforms  
Full custom SBC design | x86, Arm, and FPGA expertise | European and US design and production



Design Review



x86, Arm, FPGA expertise & cross-platform design



In-house design and production excellence



Let us design your product

### SOFTWARE CUSTOMIZATION

Customized BIOS | Firmware & driver development | BSP development | Long-term support



BIOS tuning



Linux BSP & Android development



Windows



Firmware & driver support



24/7 support for the life of the product

### SYSTEMS AND ASSEMBLY

Software pre-installed on your system | Assembly services | Design and production of fanless embedded computers  
Touch-display solutions | Design and production of your final product



Software preloaded



Fanless embedded computers



Touch displays



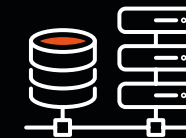
Display assembly



## KNOW - HOW

Augment the abilities of machines and people by using AI everywhere computing takes place.

## AI-AS-A-SERVICE COMPANY



Data



Detection, identification, recognition



Personalization



Explainable AI (XAI)



Natural language processing



Analytics

## PRODUCTS & SERVICES



From Edge to AI in just a few weeks



### Open-source core

All core middleware Clea components are open source software, contribute to, connect with, and join our growing community.



### Device lifecycle management

Clea manages OTA updates, remote debugging, blue/green app deployments and much more, with an intense focus on security.



### Extensive, Scalable Data Orchestration

Clea easily scales to a large number of connected devices, with the flexibility to control them in whatever granularity is required.



### Deploy AI models everywhere

Whether it's a pre-trained model or your very own, Clea enables you to easily deploy it at the edge or in the cloud, seamlessly.

## Vertical Applications for Clea



and many more...

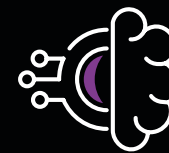




## K N O W - H O W

SECO Next, the creative laboratory of the SECO Group for business. We challenge the ordinary with researchers and innovators who create innovative solutions.

## NEXT TO YOU FOR THE NEXT FUTURE



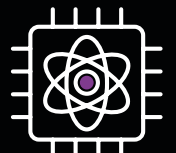
Adaptive & Federated Learning



Machine Vision & Data Fusion



5G and Beyond



Quantum Computing

## PRODUCTS & SERVICES

We create products to provide services

Welcome to Open Sustainability Innovation



### Minimum Viable Product

First version at low cost and development time to collect initial feedback and improve the functionality of the product/service.



### Commercialization

We make the product ready for mass production with the aim of the highest possible level of scalability.

## Methodology



### Exploration

We constantly monitor emerging technologies. We listen to customer problems, understand their context, and propose paths to explore together.



### Analysis

We analyze the problems, risks, and tradeoffs in depth, and together develop a project plan that factors in costs, schedule, risk, and contingencies.



### Test

We test the solution to verify its effectiveness and measure its performance. We evaluate if the solution is satisfactory or whether it needs improvement.



### Production

The best solution is commercialized, manufactured, and sold on the market, ready for user feedback for any further improvement.



## PARTNERSHIPS

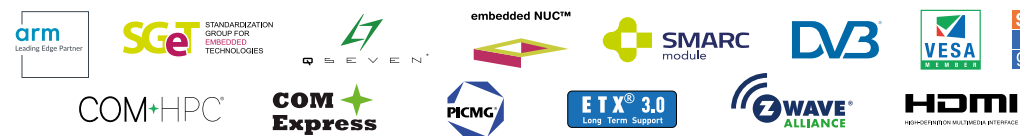
### LEADING SILICON VENDORS



### OPERATING SYSTEMS



### STANDARDS & CONSORTIUMS



## LEADING MARKETS

SECO's solutions can be found at the heart of the most sophisticated and diverse products throughout many industries, such as traditional uses in industrial automation, biomedical devices, and digital signage to emerging applications like mobile devices and robotics.



Automation



Automotive



Avionics



Biomedical/  
Medical Devices



Defense &  
Security



Digital Signage  
- Infotainment



Edge  
Computing



E - Health  
Telecare



Energy



Fitness  
Equipment



Gaming



HMI



Home  
Automation



Home  
Entertainment



Industrial  
Automation and  
Control



Info Kiosks



In-Vehicle  
Infotainment  
Systems



Makers &  
Education



Measuring  
Instruments



Mobile Devices



Multimedia  
Devices



Point of Sales



Portable  
Devices



Professional Kitchen  
Equipment



Robotics



Server - High  
Performance Computing



Surveillance



Telco



Thin Clients



Transportation



Unmanned  
Vehicle Control



Vending



Visual  
Computing



Wireless  
Technologies





Q S E V E N®

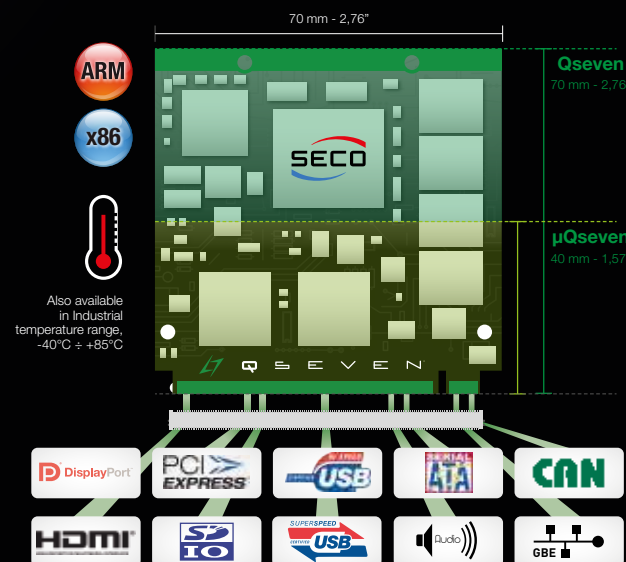
## QSEVEN® STANDARD ADVANTAGES



## COMPUTER-ON-MODULE APPROACH

Design investment limited to the carrier board | Consolidated standard form factor | Scalable and future-proof  
Long-term availability | Arm and x86 cross-compatibility | Multi-vendor solution | Highly configurable  
Innovative and upgradable | Accelerated time-to-market

## QSEVEN® FEATURES OVERVIEW



**SGE** STANDARDIZATION GROUP FOR EMBEDDED TECHNOLOGIES  
SECO is one of the founding members of SGET and a co-founder of the Qseven® standard



Qseven® with Intel® Atom® X6000E, Pentium® and Celeron® J / N Series (formerly Elkhart Lake)

High computing and graphics performance in Qseven® form factor

ATLAS



AI-ENABLED WITH CLEA

Processor	Celeron® J6413 Quad Core @ 1.8GHz (3GHz Turbo) 10W TDP Celeron® N6211 Dual Core @ 1.2GHz (3GHz Turbo) 6.5W TDP Pentium® J6426 Quad Core @ 1.8GHz (3GHz Turbo) 10W TDP Pentium® N6415 Quad Core @ 1.2GHz (3GHz Turbo) 6.5W TDP Atom® x6211E Dual Core @ 1.2GHz (3GHz Turbo) 6W TDP, IBECC - Industrial Atom® x6413E Quad Core @ 1.5GHz (3GHz Turbo) 9W TDP, IBECC - Industrial Atom® x6425E Quad Core @ 1.8GHz (3GHz Turbo) 12W TDP, IBECC - Industrial Atom® x6212RE Dual Core @ 1.2GHz (no Turbo) 6W TDP, IBECC and TCC* - Industrial Atom® x6414RE Quad Core @ 1.5GHz (no Turbo) 9W TDP, IBECC and TCC* - Industrial Atom® x6425RE Quad Core @ 1.9GHz (no Turbo) 12W TDP, IBECC and TCC* - Industrial (* TCC: Time Coordinated Computing)
Memory	Soldered down LPDDR4-3200 memory Up to 16GB with IBECC supported only with Atom™ Industrial SoCs Speed: 4267MT/s single rank (1GB / 2GB / 4GB / 8GB), 3733MT/s dual rank (16GB)
Graphics	Up to 3 independent displays Integrated Intel® Gen11 UHD Graphics controller with up to 32 EU 4K HW decoding and encoding of HEVC (H.265), H.264, VP8, VP9, WMV9/VC1 (decoding only) DirectX 12.1, OpenGL ES 3.1, OpenGL 4.5, OpenCL™ 1.2, Vulkan 1.0
Video Interfaces	1x eDP 1.3 or Single/Dual-Channel 18-/24-bit LVDS interface 1x DP++ 1.4 or HDMI 1.4 interface
Video Resolution	Up to 4096x2160 @60Hz
Mass Storage	2x S-ATA Gen3 Channels SDIO interface Optional eMMC 5.1 drive soldered on-board
Networking	1x Gigabit Ethernet PHY with precision clock synchronization and synchronous Ethernet clock output for IEEE 1588
USB	6x USB 2.0 Host ports 2x SuperSpeed USB 10Gbps Host ports (*) (* Second SuperSpeed USB 10Gbps Host port can be utilized only via Qseven® Rel. 2.1 compliant carrier boards)
PCI-e	4x PCI-e x1 Gen3 lanes
Audio	HD Audio interface
Serial Ports	2x UARTs
Other Interfaces	SPI, I2C, I2S, CAN, SM Bus, Thermal Management, FAN management Optional LPC bus Optional TPM 2.0 on-board Watchdog
Power Supply	+5V <sub>DC</sub> and +5V <sub>SB</sub> (optional)
Operating System	Microsoft® Windows 10 IoT Enterprise Yocto
Operating Temperature*	0°C - +60°C (Commercial version) -40°C - +85°C (Industrial version)
Dimensions	70 x 70 mm (2.76" x 2.76")

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.

Qseven

Qseven® with NXP i.MX 8X

Highly-efficient architecture in a compact, safety-certifiable Qseven® module

ARCALIS



AI-ENABLED WITH CLEA

Available in Industrial Temperature Range

Processor	NXP i.MX 8X family SoCs: Dual or Quad Arm Cortex®-A35 Cores + 1x Cortex® M4F core for real-time processing • NXP i.MX8 QuadXplus, 4x Arm Cortex®-A35 Cores + 1x Cortex® M4F core for real-time processing • NXP i.MX8 DualXplus, 2x Arm Cortex®-A35 Cores + 1x Cortex® M4F core for real-time processing • NXP i.MX8 DualX, 2x Arm Cortex®-A35 Cores
Max Cores	4+1
Memory	Soldered down LPDDR4 memory @ 1200MHz, 32-bit interface, up to 4GB
Graphics	Embedded GC7000Lite GPU Supports OpenGL 3.0, 2.1, OpenGL ES 3.1, OpenCL 1.2 Full Profile and 1.1, OpenVG 1.1, and Vulkan Embedded VPU, supports HW decoding of HEVC/H.265, AVC/H.264, MPEG-2, VC-1, RV10, VP8, H.263 and MPEG4.2t, HW encoding of AVC/H.264 2 independent displays supported
Video Interfaces	Factory alternatives: • 2x LVDS Single Channel / 1x LVDS Dual Channel 18-/24-bit interface • LVDS Single Channel 18-/24-bit interface + HMDI interface • eDP 4-lane interface + LVDS single Channel 18-/24-bit interface • eDP 4-lane interface + HMDI interface
Video Resolution	MIPI-DSI, LVDS, eDP, HDMI: Up to 1920 x 1080 @ 60Hz
Mass Storage	Optional Soldered onboard eMMC 5.1 Drive, up to 64GB SD 4-bit interface QSPI NOR Flash soldered on-board
Networking	1 x Gigabit Ethernet interface On-board WiFi 802.11 a/b/g/n + BT LE 5.0 module, optional
USB	2 x USB 2.0 Host Ports 2 x USB 3.0 Host Ports
PCI-e	1x PCI-e 3.0 x1 port
Audio	1x I2S Audio interface
Serial Ports	1x 4-wires UART
CAN	1x CAN interfaces
Other Interfaces	1x 4-lanes CSI camera interface 2x PWM Up to 8x GPIOs I2C bus SM bus SPI interface Watchdog Boot select signals Power Management Signals
Power Supply	+5V <sub>DC</sub> and +3.3V <sub>RTC</sub>
Operating System	Linux Android
Operating Temperature*	0°C ÷ +60°C (Commercial version) -40°C ÷ +85°C (Industrial version)
Dimensions	70 x 70 mm (2.76" x 2.76")

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.





Qseven

Qseven® with NXP i.MX 8

Take advantage of the wide scalability offered by Qseven® form factor and the i.MX 8 family

#### MAIA



Available in Industrial Temperature Range

Processor	NXP i.MX 8 Family: <ul style="list-style-type: none"><li>• <b>i.MX 8QuadMax</b> - 2x Cortex®-A72 cores @1.6GHz + 4x Cortex®-A53 cores @1.2GHz + 2x Cortex®-M4F cores @264MHz</li><li>• <b>i.MX 8QuadPlus</b> - 1x Cortex®-A72 cores @1.6GHz + 4x Cortex®-A53 cores @1.2GHz + 2x Cortex®-M4F cores @264MHz</li></ul>
Memory	Soldered Down LPDDR4-3200 memory, 64-bit interface , up to 8GB
Graphics	Integrated Graphics Processing Unit, supports 2 independent displays. Embedded VPU, supports HW decoding of HEVC/H.265, AVC/H.264, MPEG-2, VC-1, RV9, VP8, H.263 and MPEG4 part, HW encoding of AVC/H.264 Supports OpenGL ES 3.1, Open CL 1.2, OpenGL 3.x, DirectX 11
Video Interfaces	HDMI 2.0a / DP 1.3 or eDP 1.4 interface, supporting HDCP 2.2 Dual Channel or 2 x Single Channel 18- / 24-bit LVDS interface (1 x Single Channel in case of eDP interface available)
Video Resolution	HDMI / DP / eDP: resolution up to 4096x2160 @ 60Hz LVDS: resolution up to 1920x1080 @ 60Hz
Mass Storage	1x SATA Gen3 interface eMMC 5.1 drive soldered on-board SD 4-bit interface QSPI Flash soldered-on-board
Networking	1 x Gigabit Ethernet interface
USB	4 x USB 2.0 Host Ports 1 x USB 3.0 Host Port 1 x USB 2.0 OTG port
PCI-e	2x PCI-e x1 Gen3 ports
Audio	I2S Audio Interface
Serial Ports	1x UART Tx/Rx/RTS/CTS 1x CAN Bus (TTL level)
Other Interfaces	CSI camera connector 2x I2C Bus SPI interface 8 x GPIOs Boot select signal Power Management Signals Watchdog
Power Supply	+5V <sub>DC</sub> ±5% +3.3V <sub>RTC</sub>
Operating System	Linux Yocto Android
Operating Temperature*	0°C ÷ +60°C (Commercial version) -40°C ÷ +85°C (Industrial version)
Dimensions	70 x 70 mm (2.76" x 2.76")

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/ or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.

Qseven

Qseven® with NXP i.MX 8M

Qseven® solution for next generation embedded systems

#### MIRA



Available in Industrial Temperature Range

Processor	NXP i.MX 8M Family based on ARM Cortex®-A53 cores + general purpose Cortex®-M4 processor: <ul style="list-style-type: none"><li>• <b>i.MX 8M Quad</b> - 4x Cortex®-A53 cores up to 1.5GHz</li><li>• <b>i.MX 8M Dual</b> - 2x Cortex®-A53 cores up to 1.5GHz</li><li>• <b>i.MX 8M QuadLite</b> - 4x Cortex®-A53 cores up to 1.5GHz, no VPU</li></ul>
Memory	Soldered Down DDR4-2400 memory, dual-channel 32-bit interface, up to 4GB
Graphics	Integrated Graphics Processing Unit, supports 2 independent displays. Embedded VPU, supports HW decoding of HEVC, H.264, H.263, MPEG-4, MPEG-2, AVC, VC-1, RV, DivX, VP6, VP8, VP9, JPEG (not for i.MX8M QuadLite). Supports OpenGL ES 3.1, Open CL 1.2, OpenGL 2.x, DirectX 11
Video Interfaces	HDMI 2.0a / Display Port 1.3 interface, supporting HDCP 2.2 and HDCP 1.4/1.3 eDP interface or 18- / 24-bit Dual Channel LVDS interface
Video Resolution	HDMI/DP up to 4096 x 2160p60 LVDS/eDP up to 1920 x 1080 @ 60Hz
Mass Storage	eMMC 5.0 drive soldered on-board, up to 64GB Optional microSD slot on board QSPI Flash soldered-onboard
Networking	1 x Gigabit Ethernet interface Optional WiFi + BT LE module onboard
USB	1 x USB 3.0 Host or Client Port Up to 4 x USB 2.0 Host Ports
PCI-e	Up to 2 x PCI-e x1 Gen2 ports
Audio	I2S Audio Interface
Serial Ports	1x UART Tx/Rx/RTS/CTS (Optional) 1x Debug UART Optional CAN Bus interface (TTL Level)
Other Interfaces	I2C Bus SM Bus Optional SPI interface 8 x GPIOs UltraLow Power RTC Power Management Signals Watchdog
Power Supply	+5V <sub>DC</sub> ±5% and +5V <sub>SB</sub> (optional) +3.3V <sub>RTC</sub>
Operating System	Linux Yocto Android
Operating Temperature*	0°C ÷ +60°C (Commercial version) -40°C ÷ +85°C (Industrial version)
Dimensions	70 x 70 mm (2.76" x 2.76")

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/ or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.



Qseven

Qseven® with Intel® Atom® X, Celeron® J / N and Pentium® N Series (formerly Apollo Lake)

High graphics performance and extreme temperature for low power designs

#### NAOS



Available in Industrial Temperature Range

Processor	Intel® Atom™ <b>x5-E3930</b> Dual Core @1.3 GHz (Burst 1.8GHz), 2MB L2 Cache, 6.5W TDP Intel® Atom™ <b>x5-E3940</b> Quad Core @1.6 GHz (Burst 1.8GHz), 2MB L2 Cache, 9.5W TDP Intel® Atom™ <b>x7-E3950</b> Quad Core @1.6 GHz (Burst 2.0GHz), 2MB L2 Cache, 12W TDP Intel® Pentium® <b>N4200</b> Quad Core @1.1GHz (Burst 2.5GHz), 2MB L2 Cache, 6W TDP Intel® Celeron® <b>N3350</b> Dual Core @1.1GHz (Burst 2.4GHz), 2MB L2 Cache, 6W TDP Intel® Celeron® <b>J3455</b> , Quad Core @1.5GHz (Burst 2.3GHz), 2MB L2Cache, 10W TDP Intel® Celeron® <b>J3355</b> , Dual Core @2.0GHz (Burst 2.5GHz), 2MB L2Cache, 10W TDP
Max Cores	4
Max Thread	4
Memory	Dual Channel Soldered Down DDR3L-1866 memory, up to 8GB
Graphics	Integrated Intel® HD Graphics 500 series controller with up to 18 Execution Units Three Independent displays supported HW decoding of HEVC(H.265), H.264, MVC, VP8, VP9, MPEG2, VC-1, WMV9, JPEG/MJPEG formats HW encoding of HEVC(H.265), H.264, MVC, VP8, VP9 and JPEG/MPEG formats
Video Interfaces	eDP interface or Single/Dual Channel 18/24bit LVDS interface HDMI or DP++ interface
Video Resolution	DP: Up to 4096 x 2160 @60Hz eDP: Up to 3840 x 2160 @60Hz HDMI: Up to 3840 x 2160 @30Hz LVDS, VGA: Up to 1920 x 1200 @ 60Hz
Mass Storage	Optional eMMC 5.0 drive soldered on-board 2 x external S-ATA Gen3 Channels SD interface
Networking	Gigabit Ethernet interface Intel® I210 or I211 Controller (MAC + PHY)
USB	6 x USB 2.0 Host Ports 2 x USB 3.0 Host Ports (*)
PCI-e	(*) Second USB 3.0 Host port can be exploited only using Qseven® Rel. 2.1 compliant Carrier boards 4 x PCI-e Root Ports (including the PCI-e port used for Gigabit Ethernet controller)
Audio	HD Audio interface
Serial Ports	1 x UART, TTL interface
Other Interfaces	I2C Bus LPC Bus SM Bus SPI interface Watch Dog Timer Thermal / FAN management Power Management Signals
Power Supply	+5V <sub>DC</sub> and +5V <sub>SB</sub> (optional)
Operating System	Microsoft® Windows 10 Enterprise (64 bit) Microsoft® Windows 10 IoT Core Linux Yocto (64 bit)
Operating Temperature*	0°C ÷ +60°C (Commercial version) -40°C ÷ +85°C (Industrial version)
Dimensions	70 x 70 mm (2.76" x 2.76")

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/ or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.

Qseven

Qseven® with Intel® Atom® E3800 and Celeron® (formerly Bay Trail)

Mobile-oriented with eMMC and Camera Interface

#### ASTERION



Available in Industrial Temperature Range

Processor	Intel® Atom™ <b>E3845</b> , Quad Core @1.91GHz, 2MB Cache, 10W TDP Intel® Atom™ <b>E3827</b> , Dual Core @1.75GHz, 1MB Cache, 8W TDP Intel® Atom™ <b>E3826</b> , Dual Core @1.46GHz, 1MB Cache, 7W TDP Intel® Atom™ <b>E3825</b> , Dual Core @1.33GHz, 1MB Cache, 6W TDP Intel® Atom™ <b>E3815</b> , Single Core @1.46GHz, 512KB Cache, 5W TDP Intel® Atom™ <b>E3805</b> , Dual Core @1.33GHz, 1MB Cache, 3W TDP Intel® Celeron® <b>J1900</b> , Quad Core @2.0GHz, 2MB Cache, 10W TDP Intel® Celeron® <b>N2930</b> , Dual Core @1.83GHz, 2MB Cache, 7.5W TDP Intel® Celeron® <b>N2807</b> , Quad Core @1.58GHz, 1MB Cache, 4.3W TDP
Max Cores	4
Max Thread	4
Memory	Soldered on-board DDR3L memory E3845, E3827, J1900, N2930: up to 8GB Dual-Channel DDR3L 1333MHz E3826: up to 8GB Dual-Channel DDR3L 1066MHz N2807: up to 4GB Single-Channel DDR3L 1333MHz E3825, E3815: up to 4GB Single-Channel DDR3L 1066MHz
Graphics	Integrated Intel® HD Graphics 4000 series controller (not for E3805) Dual independent display support HW decoding of H.264, MPEG2, MVC, VC1, VP8, MJPEG formats HW encoding of H.264, MPEG2 and MVC formats
Video Interfaces	HDMI or Multimode Display Port interface Embedded Display Port or 18 / 24 bit dual channel LVDS interface <b>Optional Camera interface</b>
Video Resolution	HDMI: Up to 1920x1080p@60Hz Display Port, eDP: Up to 2560x1600@60Hz Optional LVDS interface: Up to 1920x1200@60Hz
Mass Storage	2 x external SATA channels SD interface <b>Optional eMMC Drive soldered on-board</b>
Networking	Gigabit Ethernet interface
USB	1 x USB 3.0 Host port 6 x USB 2.0 Host ports (one shared with USB 3.0 interface)
PCI-e	3 x PCI-e x1 lanes
Audio	HD Audio interface
Serial Ports	1 x Serial port (TTL interface)
Other Interfaces	I2C Bus LPC Bus SM Bus Thermal / FAN management SPI interface Power Management Signals
Power Supply	+5V <sub>DC</sub> ± 5%
Operating System	Microsoft® Windows 7 (32 / 64 bit) Microsoft® Windows 8.1 (32 / 64 bit) Microsoft® Windows 10 (32 / 64 bit) Microsoft® Windows 10 IoT Microsoft® Windows Embedded Standard 7 (32 / 64 bit) Microsoft® Windows Embedded Compact 7 Linux (32 / 64 bit) Yocto
Operating Temperature*	0°C ÷ +60°C (Commercial version) -40°C ÷ +85°C (Industrial version)
Dimensions	70 x 70 mm (2.76" x 2.76")

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/ or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.



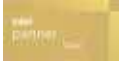


Qseven

Qseven® with Intel® Atom® E3800 and Celeron® (formerly Bay Trail)

## x86 performance on a low-power module

### AVIOR



Available in Industrial Temperature Range

Processor	Intel® Atom™ <b>E3845</b> , Quad Core @1.91GHz, 2MB Cache, 10W TDP Intel® Atom™ <b>E3827</b> , Dual Core @1.75GHz, 1MB Cache, 8W TDP Intel® Atom™ <b>E3826</b> , Dual Core @1.46GHz, 1MB Cache, 7W TDP Intel® Atom™ <b>E3825</b> , Dual Core @1.33GHz, 1MB Cache, 6W TDP Intel® Atom™ <b>E3815</b> , Single Core @1.46GHz, 512KB Cache, 5W TDP Intel® Celeron® <b>J1900</b> , Quad Core @2.0GHz, 2MB Cache, 10W TDP Intel® Celeron® <b>N2930</b> , Quad Core @1.83GHz, 2MB Cache, 7.5W TDP Intel® Celeron® <b>N2807</b> , Dual Core @1.58GHz, 1MB Cache, 4.3W TDP
Max Cores	4
Max Thread	4
Memory	Soldered on-board DDR3L memory E3845, E3827, J1900, N2930: up to 8GB Dual-Channel DDR3L @ 1333MHz E3826: up to 8GB Dual-Channel DDR3L @ 1066MHz N2807: up to 4GB Single-Channel DDR3L @ 1333MHz E3825, E3815: up to 4GB Single-Channel DDR3L @ 1066MHz
Graphics	Integrated Intel® HD Graphics 4000 series controller Dual independent display support HW decoding of H.264, MPEG2, MVC, VC1, VP8, MJPEG formats HW encoding of H.264, MPEG2 and MVC formats
Video Interfaces	HDMI or Multimode Display Port interface Embedded Display Port or 18 / 24 bit dual channel LVDS interface Additional VGA interface (optional external adapter is required)
Video Resolution	HDMI: Up to 1920x1080p@60Hz Display Port, eDP, CRT: Up to 2560x1600@60Hz Optional LVDS interface: Up to 1920x1200@60Hz
Mass Storage	Up to 2 x external SATA channels SD interface Optional SATA Flash Drive soldered on-board
Networking	Gigabit Ethernet interface
USB	1 x USB 3.0 Host port 6 x USB 2.0 Host ports (one shared with USB 3.0 interface)
PCI-e	3 x PCI-e x1 lanes
Audio	HD Audio interface
Serial Ports	1 x Serial port (TTL interface)
Other Interfaces	I2C Bus LPC Bus SM Bus Thermal / FAN management SPI interface Power Management Signals
Power Supply	+5V <sub>DC</sub> ± 5%
Operating System	Microsoft® Windows 7 (32 / 64 bit) Microsoft® Windows 8 (32/64 bit) Microsoft® Windows 8.1 (32/64 bit) Microsoft® Windows 10 (32/64 bit) Microsoft® Windows 10 IoT Microsoft® Windows Embedded Standard 7 (32/64 bit) Microsoft® Windows Embedded Compact 7 Linux (32/64 bit) Yocto
Operating Temperature*	0°C ÷ +60°C (Commercial version) -40°C ÷ +85°C (Industrial version)
Dimensions	70 x 70 mm (2.76" x 2.76")

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/ or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.

Qseven

Qseven® with NXP i.MX 6

## Optimal balance of performance and power

### ALKES



Available in Industrial Temperature Range

Processor	NXP i.MX 6 Family, based on Arm® CORTEX-A9 processors - <b>i.MX6S</b> Solo - Single core up to 1GHz - <b>i.MX6DL</b> Dual Lite - Dual core up to 1GHz per core - <b>i.MX6D</b> Dual - Dual core up to 1GHz per core - <b>i.MX6DP</b> DualPlus - Dual core up to 1GHz per core - <b>i.MX6Q</b> Quad - Quad core up to 1GHz per core
Max Cores	4
Memory	Up to 4GB DDR3L on-board (up to 2GB with i.MX6S)
Graphics	Dedicated 2D Hardware accelerator Dedicated 3D Hardware accelerator, supports OpenGL® ES 2.0 3D Dedicated Vector Graphics accelerator supports OpenVG™ (only i.MX6D, i.MX6DP and i.MX6Q) Enhanced 2D and 3D graphics with i.MX6DP Supports up to 3 independent displays with i.MX6D, i.MX6DP and i.MX6Q Supports 2 independent displays with i.MX6DL and i.MX6S
Video Interfaces	1 x LVDS Dual Channel or 2 x LVDS Single Channel 18 / 24 bit interface HDMI Interface 1.4 Video Input Port / Camera Connector
Video Resolution	LVDS, up to 1920x1200 HDMI, up to 1080p
Mass Storage	On-board eMMC drive, up to 32 GB SD / MMC / SDIO interface 1 x µSD Card Slot on-board 1 x External SATA Channel (only available with i.MX6D and i.MX6Q)
Networking	Gigabit Ethernet interface
USB	1 x USB OTG interface 4 x USB 2.0 Host interfaces
PCI-e	1 x PCI-e x1 lane (only PCI-e 1.1 and Gen2 are supported)
Audio	AC'97 Audio interface I2S
Serial Ports	2 x Serial ports (TTL interface) CAN port interface
Other Interfaces	I2C Bus LPC Bus SM Bus Power Management Signals
Power Supply	+5V <sub>DC</sub> ± 5%
Operating System	Linux Yocto Microsoft® Windows Embedded Compact 7
Operating Temperature*	0°C ÷ +60°C (Commercial version) -40°C ÷ +85°C (Industrial version)
Dimensions	70 x 70 mm (2.76" x 2.76")

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/ or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.



µQseven

µQseven® with NXP i.MX 8M Mini & NXP i.MX 8M Nano

## Advanced 14LPC FinFET process technology for more speed and power efficiency

### ELECTRA



Processor	NXP i.MX 8M Mini Family based on Arm® Cortex®-A53 cores + general purpose Cortex®-M4 400MHz processor: • <b>i.MX 8M Mini Quad</b> - Full featured, 4x Cortex®-A53 cores up to 1.8GHz • <b>i.MX 8M Mini Dual</b> - Full featured, 2x Cortex®-A53 cores up to 1.8GHz • <b>i.MX 8M Mini Solo</b> - Full featured, 1x Cortex®-A53 cores up to 1.8GHz • <b>i.MX 8M Mini Quad Lite</b> - 4x Cortex®-A53 cores up to 1.8GHz, no VPU • <b>i.MX 8M Mini Dual Lite</b> - 2x Cortex®-A53 cores up to 1.8GHz, no VPU • <b>i.MX 8M Mini Solo Lite</b> - 1x Cortex®-A53 cores up to 1.8GHz, no VPU NXP i.MX 8M Nano Family based on Arm® Cortex®-A53 cores + general purpose Cortex®-M7 750MHz processor: • <b>i.MX 8M Nano Quad</b> - Full featured, 4x Cortex®-A53 cores up to 1.5GHz • <b>i.MX 8M Nano Dual</b> - Full featured, 2x Cortex®-A53 cores up to 1.5GHz • <b>i.MX 8M Nano Solo</b> - Full featured, 1x Cortex®-A53 cores up to 1.5GHz • <b>i.MX 8M Nano Quad Lite</b> - 4x Cortex®-A53 cores up to 1.5GHz, no VPU • <b>i.MX 8M Nano Dual Lite</b> - 2x Cortex®-A53 cores up to 1.5GHz, no VPU • <b>i.MX 8M Nano Solo Lite</b> - 1x Cortex®-A53 cores up to 1.8GHz, no VPU
Max Cores	4+1
Memory	Soldered Down onboard DDR4 memory: • Up to 4GB of DDR4-2400, 32-bit bus memory (i.MX8M Mini) • Up to 2GB of DDR4-2400, 16-bit bus memory (i.MX8M Nano)
Graphics	i.MX 8M Mini Family of processors: Vivante GC320 2D accelerator + GCNanoUltra 3D accelerator OpenGL ES 2.0, OpenVG 1.1 support i.MX 8M Nano Family of processors: Vivante GC7000UL 2D/3D GPU OpenGL ES 3.1, OpenCL1.2, Vulkan support  Only for i.MX 8M Mini Family, not for Lite processors, embedded VPU able to offer: • VP9, HEVC/H.265, AVC/H.264, VP8 HW Decoding • AVC/H.264, VP8 HW encoding
Video Interfaces	Single/Dual Channel 18/24 bit LVDS interface or eDP interface
Video Resolution	Up to 1920 x 1080p
Mass Storage	eMMC 5.1 drive on-board, up to 64GB SD / MMC / SDIO interface Optional QSPI Flash for booting
Networking	Gigabit Ethernet interface Optional WiFi 802.11 a/b/g/n/ac +BT 5.0 NGFF module soldered on-board
USB	5x USB 2.0 Host ports (i.MX 8M Mini) 4x USB 2.0 Host ports (i.MX 8M Nano)
PCI-e	1 x PCI Express x 1 lane (only with i.MX 8M Mini)
Audio	I2S Audio Interface
Serial Ports	1x 4-wire UART + 1 x Debug UART Optional CAN interface
Other Interfaces	SPI interface Watchdog 8x GPIO SM Bus I2C interface
Power Supply	+5V <sub>DC</sub> and +5V <sub>SB</sub> (optional)
Operating System	Linux (Yocto)
Operating Temperature*	0°C ÷ +60 °C (commercial temp.) -30°C ÷ +85°C (extended temp.)
Dimensions	40 x 70 mm (µQseven, 1.57" x 2.76")

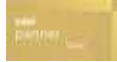
\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/ or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.

µQseven

µQseven® with Intel® Atom® E3800 and Celeron® (formerly Bay Trail)

## Smallest x86 standard module at proprietary costs

### KUMA



Available in Industrial Temperature Range

Processor	Intel® Celeron® <b>N2807</b> , Dual Core @1.58GHz, 1MB Cache, 4.3W TDP Intel® Atom™ <b>E3815</b> , Single Core @1.46GHz, 512KB Cache, 5W TDP Intel® Atom™ <b>E3825</b> , Dual Core @1.33GHz, 1MB Cache, 6W TDP
Max Cores	2
Max Thread	2
Memory	Soldered on-board DDR3L memory E3825, E3815: up to 4GB Single-Channel DDR3L @ 1066MHz N2807: up to 4GB Single-Channel DDR3L @ 1333MHz
Graphics	Integrated Intel® HD Graphics 4000 series controller Dual independent display support HW decoding of H.264, MPEG2, MVC, VC1, VP8, MJPEG formats HW encoding of H.264, MPEG2 and MVC formats
Video Interfaces	Multimode Display Port interface 18 / 24 bit dual channel LVDS interface
Video Resolution	DP++ (HDMI compatible): Up to 2560x1600@60Hz LVDS interface: Up to 1920x1200@60Hz
Mass Storage	2 x external SATA channels SD interface Optional eMMC drive soldered on-board
Networking	Gigabit Ethernet interface
USB	1 x USB 3.0 Host port 4 x USB 2.0 Host ports (one shared with USB 3.0 interface)
PCI-e	3 x PCI-e x1 lanes Gen2
Audio	HD Audio interface
Serial Ports	1 x Serial port (TTL interface, Tx / Rx only)
Other Interfaces	I2C Bus LPC Bus SM Bus Thermal / FAN management Power Management Signals
Power Supply	+5V <sub>DC</sub> ± 5%
Operating System	Microsoft® Windows 7 Microsoft® Windows 8.1 Microsoft® Windows 10 Microsoft® Windows 10 IoT Microsoft® Windows Embedded Standard 7 Microsoft® Windows Embedded Compact 7 Linux Yocto
Operating Temperature*	0°C ÷ +60°C
Dimensions	40 x 70 mm (1.57" x 2.76")

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/ or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.





µQseven

µQseven® with NXP i.MX 6

Small, flexible OTS module at proprietary costs

NEMBUS



Available in Industrial Temperature Range

Processor	NXP i.MX 6 Family, based on Arm® CORTEX-A9 processors - <b>i.MX6S</b> Solo - Single core up to 1GHz - <b>i.MX6DL</b> Dual Lite - Dual core up to 1GHz per core
Max Cores	2
Memory	Up to 1GB DDR3L on-board (up to 512MB with i.MX6S Solo) 32-bit I/F
Graphics	Dedicated 2D Hardware accelerator Dedicated 3D Hardware accelerator, supports OpenGL® ES2.0 3D Supports 2 independent displays
Video Interfaces	1 x LVDS Dual Channel or 2 x LVDS Single Channel 18 / 24 bit interface HDMI Interface
Video Resolution	LVDS, resolution up to 1920x1200 HDMI, resolution up to 1080p
Mass Storage	On-board eMMC drive, up to 8 GB SD / MMC / SDIO interface Internal SPI Flash for booting
Networking	FastEthernet (10 / 100 Mbps) interface
USB	1 x USB OTG interface 1 x USB 2.0 Host interface
PCI-e	1 x PCI-e x1 lane (only PCI-e 1.1 and Gen2 are supported)
Audio	I2S / AC'97 Audio interface
Other Interfaces	On the card edge connector, many pins can be used as General Purpose I / Os or to implement some(*) of the following extra functionalities: - Additional SD interface - Up to 4 UARTs - CAN interface - Watchdog(s) - I2C interfaces - PWM outputs - SPI interface - Additional Audio interface (*) not all the combinations are allowed simultaneously Power Management Signals
Power Supply	+5V <sub>DC</sub> ± 5% Optional Low Power RTC
Operating System	Linux Yocto
Operating Temperature*	0°C ÷ +60 °C (Commercial temp.) -40°C ÷ +85°C (Industrial version)
Dimensions	40 x 70 mm (1.57" x 2.76")

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.

µQseven

µQseven® with NXP i.MX 6

Optimal balance of performance and size

LIBERTAS



Available in Industrial Temperature Range

Processor	NXP i.MX 6 Family, based on Arm® CORTEX-A9 processors - <b>i.MX6S</b> Solo - Single core up to 1GHz - <b>i.MX6DL</b> Dual Lite - Dual core up to 1GHz per core - <b>i.MX6D</b> Dual - Dual core up to 1GHz per core - <b>i.MX6Q</b> Quad - Quad core up to 1GHz per core
Max Cores	4
Memory	Up to 2GB DDR3L on-board (up to 1GB with i.MX6S)
Graphics	Dedicated 2D Hardware accelerator Dedicated 3D Hardware accelerator, supports OpenGL® ES2.0 3D Dedicated Vector Graphics accelerator supports OpenVG™ (only i.MX6D and i.MX6Q) Supports up to 3 independent displays with i.MX6D and i.MX6Q Supports 2 independent displays with i.MX6DL and i.MX6S
Video Interfaces	1 x LVDS Dual Channel or 2 x LVDS Single Channel 18 / 24 bit interface HDMI Interface 1.4
Video Resolution	LVDS up to 1920x1200 HDMI up to 1080p
Mass Storage	Up to 8 GB eMMC drive soldered on-board SD / MMC / SDIO interface 1 x External SATA Channel (only available with i.MX6D and i.MX6Q)
Networking	Gigabit Ethernet interface
USB	1 x USB OTG interface 4 x USB 2.0 Host interfaces
PCI-e	1 x PCI-e x1 lane (only PCI-e 1.1 and Gen2 are supported)
Audio	I2S / AC'97 Audio interface
Serial Ports	2 x Serial ports (TTL interface) CAN port interface
Other Interfaces	I2C Bus SM Bus Power Management Signals
Power Supply	+5V <sub>DC</sub> ± 5%
Operating System	Linux Yocto
Operating Temperature*	0°C ÷ +60°C (Commercial version) -40°C ÷ +85°C (Industrial version)
Dimensions	40 x 70 mm (1.57" x 2.76")

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.



Carrier Board

Carrier Board for Qseven® modules in 3.5" Form Factor

Wide range of interfaces for broad development possibilities

CQ7-D59



Cross-compatible platform with x86 and Arm solutions

Available in Industrial Temperature Range

Video Interfaces	LVDS Single/Dual Channel 18-24-bit + HDMI Connector <b>or</b> 2 x eDP connectors + Multimode Display Port
Mass Storage	1 x SATA connector with HDD Power connector 1 x M.2 Socket 2 2242 Key B SSD Slot microSD Slot on combo microSD + SIM connector
Networking	Up to 2 x Gigabit Ethernet connectors 1 x M.2 Socket 2 2242/3042 Key B Slot for WWAN Modem Modules, connected to on-board miniSIM slot
USB	2 x Superspeed USB 5Gbp Host port on Dual Type-A socket 1 x USB 2.0 Host ports on double Type-A sockets 1 x USB 2.0 Host on internal M.2 Socket 1 x USB 2.0 OTG port on micro-AB socket (USB port shared with USB 2.0 lanes of 1 x USB 3.0)
Audio	Audio interface on internal pin header
Serial Ports	4-wire RS-232 / RS-422 / RS-485 configurable serial port on DB9 male connector 2 x RS-232 Full-modem serial ports on internal header (need LPC interface from Qseven® module) CAN interface on PCB terminal block
Other Interfaces	SPI internal pin header LPC Bus internal pin header SM Bus / I2C GPIO expander, makes available 16 x GPIOs on internal pin header Front Panel Header 1 x 28 pin connector for additional features (I2C, ACPI signals, SM Bus, Watch Dog, Thermal Management) +12V Tachometric FAN connector Optional Debug USB port on miniB socket Optional MFG connector for JTAG programming of Qseven® module
Power Supply	24V <sub>DC</sub> ±5% through Micro-fit 2x2 power connector Coin cell battery Holder for CMOS and RTC
Operating Temperature*	-40°C ÷ +85°C (Industrial temperature range)
Dimensions	146 x 102 mm (5.75" x 4.02")

\*All carrier board components must remain within the operating temperature at any and all times, including start-up; carrier operating temperature is independent of the module installed. Please refer to the specific module for more details. Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider specific cooling solutions for the final system.

Carrier Board for Qseven® and µQseven® Modules



Carrier Board

Carrier Board for Qseven® and µQseven® modules in Embedded NUC™ Form Factor

Wide range of interfaces for broad development possibilities

CQ7-D03



Cross-compatible platform with x86 and Arm solutions

Available in Industrial Temperature Range

Video Interfaces	LVDS Dual Channel 24-bit + backlight connector HDMI Connector
Mass Storage	microSD Slot
Networking	1 x Gigabit Ethernet connectors 1 x Mini-PCIe Slot for WWAN Modem Modules, connected to on-board microSIM slot
USB	1 x USB 2.0 Host port on Type-A socket 1 x USB 3.0 Host ports on Type-A socket shared with USB 2.0 OTG Client 1 x USB 2.0 OTG port on micro-AB socket shared with USB 3.0 Host 1 x USB 2.0 Host port on internal connector 1 x USB 2.0 Host port on M.2 Socket 1 KeyE Slot 1 x USB 2.0 Host port on mini-PCIe Slot
PCI-e	1 x PCIe x1 lane on M.2 Socket 1 Key E Slot 1 x PCIe x1 lane on Mini-PCIe Slot
Audio	Optional combo TRSS audio connector Mic in/Stereo out
Serial Ports	Optional 4-wires RS-232 / RS-422 / RS-485 configurable serial port on pin header
Other Interfaces	Optional 1 x CAN port on pin header 1 x PCIe x1 lane on M.2 Socket 1 Key E Slot 1 x PCIe x1 lane on Mini-PCIe Slot 1 x 40 pin connector for I2C, SPI and General Purpose I/O, pinout compatible with the Raspberry Pi - GPIO Connector 1 x LED driver connector 4-wires FAN connector configurable microSIM Slot for miniPCIe Modem Debug USB port on micro-AB socket MFG connector for JTAG programming of Qseven® module
Power Supply	12VDC through USB Type-C connector Coin cell battery Holder for CMOS and RTC
Operating Temperature*	0°C ÷ +70°C
Dimensions	eNUCTM compliant:101.6 x101.6 mm (4"×4")

\*All carrier board components must remain within the operating temperature at any and all times, including start-up; carrier operating temperature is independent of the module installed. Please refer to the specific module for more details. Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider specific cooling solutions for the final system.

Carrier Board for Qseven® and µQseven® Modules





Cross Platform Starter Kit compatible  
with **x86 and Arm** Qseven® modules

Quickly “start” prototyping for short  
time-to-market

Q7 STARTER KIT 2.1



**CROSS  
PLATFORM**  
Philosophy

Cross-compatible  
platform with x86  
and Arm solutions

SCHEMATICS  
PUBLICLY AVAILABLE



Cross Platform Dev Kit compatible  
with **x86 and Arm** Qseven® modules

Everything you need for flexible development

Q7 DEV KIT 2.0



**CROSS  
PLATFORM**  
Philosophy

Cross-compatible  
platform with x86  
and Arm solutions

SCHEMATICS  
PUBLICLY AVAILABLE



FEATURES OF CQ7-D59

Available in Industrial  
Temperature Range

Video Interfaces	LVDS Single/Dual Channel 18-24-bit + HDMI Connector <b>or</b> 2 x eDP connectors + Multimode Display Port
Mass Storage	1x SATA connector with HDD power connector 1x M.2 Socket 2 2242 Key B SSD slot microSD Slot on combo microSD + SIM connector
Networking	2 x Gigabit Ethernet connectors 1 x M.2 Socket 2 2242/3042 Key B Slot for WWAN cellular modem modules, connected to on-board miniSIM slot
USB	2x Superspeed USB 5Gbp Host port on dual Type-A socket 1x USB 2.0 Host ports on double Type-A sockets 1x USB 2.0 Host on internal M.2 socket 1 x USB 2.0 OTG port on micro-AB socket (USB port shared with USB 2.0 lanes of 1 x USB 3.0)
Audio	Audio interface on internal pin header
Serial Ports	4-wires RS-232 / RS-422 / RS-485 configurable serial port on DB9 male connector 2x RS-232 full-modem serial ports on internal header (need LPC interface from Qseven® module) CAN interface on PCB terminal block
Other Interfaces	SPI internal pin header LPC Bus internal pin header 16x GPIO signals on pin header via a GPIO expander controlled via SM Bus or I2C Front panel header 1x 28 pin connector for additional features (I2C, ACPI signals, SMBus, watchdog, thermal management) +12V tachometric FAN connector Optional debug USB port on miniB socket Optional MFG connector for JTAG programming of Qseven® module
Power Supply	24V <sub>DC</sub> ±5% through Micro-fit 2x2 power connector Coin cell battery holder for powering CMOS and RTC
Operating Temperature*	-40°C ÷ +85°C (Industrial temperature range)
Dimensions	146 x 102 mm (5.75" x 4.02")

\*All carrier board components must remain within the operating temperature at any and all times, including start-up; carrier operating temperature is independent of the module installed. Please refer to the specific module for more details. Actual temperature will widely depend on application, enclosure and/or environment. The customer must design a product-specific cooling solution for their final system.

FEATURES OF CQ7-A30

Available in Industrial  
Temperature Range

Video Interfaces	HDMI / Display Port interface on PCI-e x16 slot LVDS / eDP interface on PCI-e x8 slot
Mass Storage	SATA Female 7p connector with dedicated Power connector, interface shared with mSATA Slot SATA Male 7+15p connector SD / MMC Card Slot SPI Flash Socket I2C EEPROM Socket
Networking	Gigabit Ethernet connector
USB	1 x USB 3.0 Host Type-A socket 1 x USB 3.0 OTG micro-AB socket 2 x USB 2.0 Host ports on internal pin header (alternative to USB 3.0 port #0) Up to 4 x USB 2.0 Host ports on quad Type-A socket
PCI-e	PCI-e x4 interface on dedicated PCI-e x16 slot shared with 3 x PCI-e x1 slots + miniPCI-e slot (selection via jumper)
Audio	Embedded HD Audio Codec, Realtek ALC888 2 x Triple HD Audio jacks 2 S / PDIF connectors (In & Out) Audio Expansion Slot
Serial Ports	CAN Bus (both TTL interface and with CAN transceiver) 3 x RS-232 only ports 2 x RS-232 / RS-422 / RS-485 configurable serial ports
Other Interfaces	Feature Connector, with I2C , SM Bus, Watchdog, Thermal and Power Management Signals LPC Bus Header SPI Pin Header SIM Card slot 4 x 7-segment LCD displays for POST codes PS / 2 Mouse / keyboard pin header 2 x tachometric FAN connectors Debug Port on mini-B USB connector Power, Reset, LID and Sleep Buttons
Power Supply	+12V <sub>DC</sub> Coin cell battery Holder for CMOS and RTC
Operating Temperature*	0° C ÷ 60° C
Dimensions	345 x 170 mm (13.58" x 6.69")

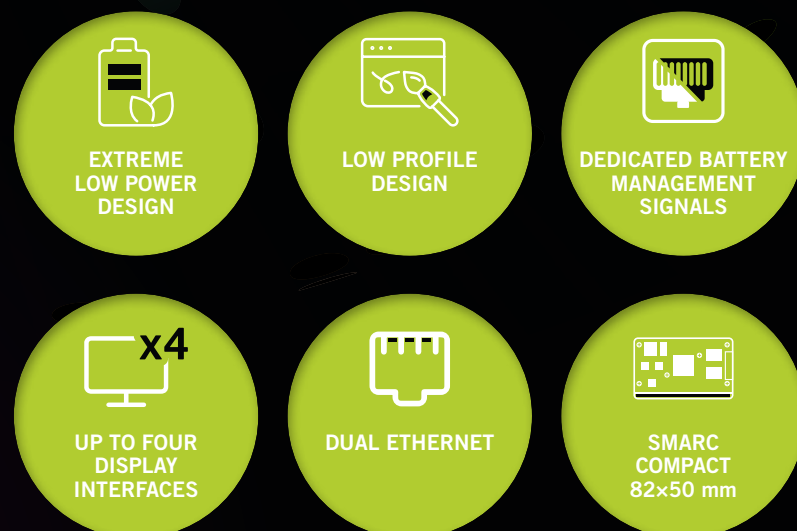
\*All carrier board components must remain within the operating temperature at any and all times, including start-up; carrier operating temperature is independent of the module installed. Please refer to the specific module for more details. Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider specific cooling solutions for the final system.

Development kit for Qseven®  
and µQseven® Modules

Development kit for Qseven®  
and µQseven® Modules



## SMARC STANDARD ADVANTAGES



## COMPUTER-ON-MODULE APPROACH

Design investment limited to the carrier board | Consolidated standard form factor | Scalable and future-proof  
Long-term availability | Arm and x86 cross-compatibility | Multi-vendor solution | Highly configurable  
Innovative and upgradable | Accelerated time-to-market

## SMARC SUPPORTED FEATURES

System I/O interface	# of interfaces	System I/O interface	# of interfaces
PCI Express lanes	4	Secure Digital I/O 4-bit	1
Serial ATA channels	1	I <sup>2</sup> C Bus	5
USB 2.0 ports	6	SPI Bus	2
USB 3.0 ports	2	CAN Bus	2
LVDS channels embedded DisplayPort	2	Watchdog Timer	1
DP++ / HDMI	1 dedicated DP++ 1 shared DP++ / HDMI	Boot selection signals	3
Camera interfaces	2 MIPI CSI	GPIOs	12 (some with alternate functions)
High Definition Audio / I2S	1 I2S + 1 shared I2S / HD Audio	Reset out and Reset in Power button in Power source status Module power state status System management pins Battery and battery charger management pins Carrier Power On control	
Ethernet 10/100/1000 Mbps	2		
UARTs	2 x 4-Wire + 2 x 2-Wire		



SECO is one of the  
founding members of SGET  
and a co-founder of the  
Qseven® standard



SMARC

SMARC® with Intel® Atom® x6000E, Pentium® and  
Celeron® J / N Series, (formerly Elkhart Lake)

Specifically designed for Functional Safety  
(FuSa) of Safety-related systems

HALLEY



Available in Industrial  
Temperature Range

Processor	Intel® Atom™ x6000E CPUs certified for FuSa, compliant to IEC 61508 and ISO 13849 requirements for Functional Safety and Safety Integrity Levels: <ul style="list-style-type: none"><li>Atom™ <b>x6427FE</b> Quad Core @1.9GHz (no Turbo) 12W TDP w/ IBECC, IHS and TCC, FuSa Certified - Ind. Temp. Range</li><li>Atom™ <b>x6200FE</b> Dual Core @1.0GHz (no Turbo) 4.5W TDP no Graphics w/ IBECC, IHS and TCC, FuSa Certified - Ind. Temp. Range</li></ul> Other Intel Atom™ x6000E, Pentium® and Celeron® N and J Series CPUs: <ul style="list-style-type: none"><li>Celeron® <b>J6413</b> Quad Core @ 1.8GHz (3.0GHz Turbo) 10W TDP - Comm. Temp. Range</li><li>Celeron® <b>N6211</b> Dual Core @1.2GHz (3.0GHz Turbo) 6.5W TDP - Comm. Temp. Range</li><li>Pentium® <b>J6426</b> Quad Core @2GHz (3.0GHz Turbo) 10W TDP - Comm. Temp. Range</li><li>Pentium® <b>N6415</b> Quad Core @1.2GHz (3.0GHz Turbo) 6.5W TDP - Comm. Temp. Range</li><li>Atom™ <b>x6211E</b> Dual Core @1.3GHz (3.0GHz Turbo) 6W TDP w/ IBECC and IHS - Ind. Temp. Range</li><li>Atom™ <b>x6413E</b> Quad Core @1.5GHz (3.0GHz Turbo) 9W TDP w/ IBECC and IHS - Ind. Temp. Range</li><li>Atom™ <b>x6425E</b> Quad Core @2GHz (3.0GHz Turbo) 12W TDP w/ IBECC and IHS - Ind. Temp. Range</li><li>Atom™ <b>x6212RE</b> Dual Core @1.2GHz (no Turbo) 6W TDP w/ IBECC, IHS and TCC - Ind. Temp. Range</li><li>Atom™ <b>x6414RE</b> Quad Core @1.5GHz (no Turbo) 9W TDP w/ IBECC, IHS and TCC - Ind. Temp. Range</li><li>Atom™ <b>x6425RE</b> Quad Core @1.9GHz (no Turbo) 12W TDP w/ IBECC, IHS and TCC - Ind. Temp. Range</li></ul> (*) IHS: Integrated Heatspreader; TCC: Time Coordinated Computing
Max Cores	4
Memory	32-bit LPDDR4x Soldered Down Memory   Up to 16GB Quad Channel with In-Band Error Correction Code (IBECC, Safety Related feature) supported 4GB Dual Channel, 8GB or 16GB Quad Channel supported   Speed: 4267MT/s single rank (1GB / 2GB / 4GB / 8GB), 3733MT/s dual rank (16GB)
Graphics	Up to 3 independent displays   Integrated Gen11 UHD Graphics controller with up to 32 EU   4K HW decoding and encoding of HEVC (H.265), H.264, VP8/VP9, WMV9/VC1 (decoding only)   DirectX 12.1, OpenGL ES 3.1, OpenGL 4.5, OpenCL™ 1.2, Vulkan 1.0
Video Interfaces	eDP 1.3 or Dual Channel 18/24bit LVDS interface (factory options)
Video Resolution	2 x DP++ 1.4 or 1x DP++ 1.4 and 1x HDMI 1.4 interfaces
Mass Storage	Up to 4096x2160 @60Hz
Networking	1 x external S-ATA Gen3 Channel   SDIO interface   Optional eMMC 5.1 drive soldered on-board (Safety Related)
USB	2x Gigabit Ethernet PHY with precision clock synchronization and synchronous Ethernet clock output for IEEE 1588 (Safety Related - Black channel)   Optional SERDES (SGMII) Interface for additional third Gigabit Ethernet (factory option, alternative to fourth PCI-e lane)
PCI-e	6 x USB 2.0 Host Ports   2 x USB 3.1 Gen2 Ports
Audio	Up to 4 x PCI-e Gen3 Lanes
Serial Ports	HD Audio interface
CAN Bus	2 x HS-UARTs (Safety Related)   2 x UARTs
Other Interfaces	2x
Functional Safety features	Up to 14x GPIOs   SM Bus   Power Management Signals   I2C Bus   1x SPI interface for boot   1x General Purpose SPI or eSPI (Factory Alternatives)
Power Supply	FuSa Interface signals for IEC 61508 and ISO 13849
Operating System	+5V <sub>dc</sub> and +3.3V <sub>RTC</sub>
Operating Temperature*	Microsoft® Windows 10 Enterprise (64 bit)   Linux Yocto 64-bit
Dimensions	-40°C ÷ +85°C (Industrial version)

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.

SMARC

SMARC® with NXP i.MX 8M Plus

Low-power design for embedded applications  
of machine learning at higher levels

LEVY



Available in Industrial  
Temperature Range

Processor	NXP i.MX 8M Plus family SoCs: Dual or Quad Arm Cortex®-A53 Cores + general purpose Cortex® M7 800MHz processor <ul style="list-style-type: none"><li>NXP i.MX 8M Plus Quad, 4x Arm Cortex®-A53 Cores up to 1.8GHz</li><li>NXP i.MX 8M Plus Dual, 2x Arm Cortex®-A53 Cores up to 1.8GHz</li><li>NXP i.MX 8M Plus Quad Lite, 4x Arm Cortex®-A53 Cores up to 1.8GHz, no VPU / NPU</li></ul>
Max Cores	4+1
Memory	Soldered down LPDDR4-4000 memory, 32-bit interface, up to 8GB
NPU	2.3 TOPS Neural Network performance (not for Quad Lite)
Graphics	Integrated Graphics Processing Unit GC7000UL, supports 3 independent displays. Embedded VPU, supports HW decoding of HEVC/H.265, AVC/H.264, MPEG-4, MPEG-2, MVC, VC-1, RV, VP6, VP7, VP8, VP9, JPEG, HW encoding of HEVC/H.265, AVC/H.264
Video Interfaces	Supports OpenVG 1.1, OpenGL ES 3.1, OpenCL 1.2 Full Profile and Vulkan
Video Resolution	Up to 3 video display interfaces
Mass Storage	HDMI 2.0a interface, supporting HDCP 2.2 and HDCP 1.4/1.3
Networking	2xLVDS Single Channel / 1xLVDS Dual Channel or eDP + 1xLVDS Single Channel (factory alternatives)
USB	Up to 3 video display interfaces
PCI-e	HDMI, LVDS, eDP Up to 1920 x 1080p @60
Audio	Soldered onboard eMMC 5.1 Drive, up to 64GB
Serial Ports	SD 4-bit interface
CAN Bus	Up to 2 x Gigabit Ethernet interfaces
Other Interfaces	Optional WiFi + BT LE module onboard
Power Supply	Up to 2 x USB 2.0 Host Ports
Operating System	2 x USB 3.0 Host Ports
Operating Temperature*	1 x USB 2.0 OTG port
Dimensions	Up to 1x PCI-e x1 Gen3 port

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.





SMARC

SMARC® with NXP i.MX 8X

Safety-certifiable and efficient performance  
in SMARC Standard module

SWAN

Available in Industrial  
Temperature Range

Processor	NXP i.MX 8X family SoCs: Dual or Quad Arm Cortex®-A35 Cores + 1x Cortex® M4F core for real-time processing <ul style="list-style-type: none"><li>NXP i.MX8 QuadXplus, 4x Arm Cortex®-A35 Cores + 1x Cortex® M4F core for real-time processing</li><li>NXP i.MX8 DualXplus, 2x Arm Cortex®-A35 Cores + 1x Cortex® M4F core for real-time processing</li><li>NXP i.MX8 DualX, 2x Arm Cortex®-A35 Cores</li></ul>
Max Cores	4+1
Memory	Soldered down LPDDR4 memory @ 1200MHz, 32-bit interface, up to 4GB
Graphics	Embedded GC7000Lite GPU Supports OpenGL 3.0, 2.1, OpenGL ES 3.1, OpenCL 1.2 Full Profile and 1.1, OpenVG 1.1, and Vulkan Embedded VPU, supports HW decoding of HEVC/H.265, AVC/H.264, MPEG-2, VC-1, RV10, VP8, H.263 and MPEG4.2t, HW encoding of AVC/H.264 2 independent displays supported
Video Interfaces	Factory alternatives: <ul style="list-style-type: none"><li>2x LVDS / Mipi-DSI Single Channel or 1xLVDS / Mipi-DSI Dual Channel 18-/24-bit interface</li><li>LVDS / Mipi-DSI Single Channel 18-/24-bit interface + HDMI interface</li><li>eDP 4-lane interface + LVDS / Mipi-DSI single Channel 18-/24-bit interface</li><li>eDP 4-lane interface + HDMI interface</li></ul>
Video Resolution	MIPI-DSI, LVDS, eDP, HDMI Up to 1920 x 1080 @ 60Hz
Mass Storage	Optional Soldered onboard eMMC 5.1 Drive, up to 64GB SD 4-bit interface QSPI NOR Flash soldered on-board
Networking	Up to 2 x Gigabit Ethernet interfaces On-board WiFi 802.11 a/b/g/n + BT LE 5.0 module, optional
USB	Up to 3 x USB 2.0 Host Ports 2 x USB 3.0 Host Ports
PCI-e	1x PCI-e 3.0 x1 port
Audio	Up to 2x I2S Audio interfaces
Serial Ports	2x 2-wires UART 2x 4-wires UART
CAN Bus	2x CAN interfaces
Other Interfaces	1x 4-lanes CSI camera interface 2x PWM Up to 14x GPIOs I2C bus SM bus SPI interface QuadSPI interface Watchdog Boot select signals Power Management Signals
Power Supply	+5V <sub>DC</sub> and +3.3V <sub>RTC</sub>
Operating System	Linux Android
Operating Temperature*	0°C ÷ +60°C (Commercial version) -40°C ÷ +85°C (Industrial version)
Dimensions	50 x 82 mm (1.97" x 3.23")

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.

SMARC

SMARC® with NXP i.MX 8M

Standard solution for next generation  
multimedia applications

LEXELL

Available in Industrial  
Temperature Range

Processor	NXP i.MX 8M Family based on Arm Cortex®-A53 cores + general purpose Cortex®-M4 processor: <ul style="list-style-type: none"><li><b>i.MX 8M Quad</b> - 4x Cortex®-A53 cores up to 1.5GHz</li><li><b>i.MX 8M Dual</b> - 2x Cortex®-A53 cores up to 1.5GHz</li><li><b>i.MX 8M QuadLite</b> - 4x Cortex®-A53 cores up to 1.5GHz, no VPU</li></ul>
Memory	Soldered Down LPDDR4-3200 memory, 32-bit interface, up to 4GB
Graphics	Integrated Graphics Processing Unit, supports 2 independent displays Embedded VPU, supports HW decoding of HEVC (H.265), H.264, H.263, MPEG-4, MPEG-2, AVC, VC-1, RV, DivX, VP6, VP8, VP9, JPEG Supports OpenGL ES 3.1, Open CL 1.2. OpenGL 2.X, Vulkan, DirectX, Open VG 1.1
Video Interfaces	HDMI 2.0a interface, supporting HDCP 2.2 and HDCP 1.4 18- / 24-bit Dual Channel LVDS interface (factory option)
Video Resolution	HDMI: Up to 4096 x 2160 @ 60 (4K) LVDS: Up to 1920 x 1080 @ 60Hz
Mass Storage	Optional SD 4-bit interface QSPI Flash soldered on-board eMMC 5.0 drive soldered on-board
Networking	1 x Gigabit Ethernet interface Optional WiFi + BT LE module onboard
USB	2 USB 3.0 Host ports 2 USB 2.0 Host ports 1 USB 2.0 OTG port
PCI-e	2x PCI-e x1 ports
Audio	I2S Audio Interface
Serial Ports	Up to 2x UART Tx/Rx/RTS/CTS 2x UART Tx/Rx 1x CAN Bus (TTL level)
Other Interfaces	1x 4-lanes + 1x 2-lanes CSI camera interfaces I2C Bus SM Bus 2x SPI interfaces QuadSPI interface 14 x GPIOs Boot select signals Power Management Signals
Power Supply	+5V <sub>DC</sub> +3.3V <sub>RTC</sub>
Operating System	Linux Yocto Android
Operating Temperature*	0°C ÷ +60°C (Commercial version) -40°C ÷ +85°C (Industrial version)
Dimensions	50 x 82 mm (1.97" x 3.23")

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.



SMARC

SMARC® with Xilinx® Zynq® Ultrascale+™

Flexible ARM + FPGA Heterogeneous  
Processing in a Standard Form Factor

RUSSELL

Available in Industrial  
Temperature Range

Processor	Xilinx® Zynq® Ultrascale+™ <b>ZU2CG, ZU3CG, ZU4CG or ZU5CG</b> MPSoCs: Dual-core ARM® Cortex®-A53 MPCore Application Processing Unit + Dual-core ARM® Cortex®-R5 Real-Time Processing Unit
Memory	Xilinx® Zynq® Ultrascale+™ <b>ZU2EG, ZU3EG, ZU4EG, ZU5EG, ZU4EV or ZU5EV</b> MPSoCs: Quad-core ARM® Cortex®-A53 MPCore Application Processing Unit + Dual-core ARM® Cortex®-R5 Real-Time Processing Unit
Graphics	Soldered Down DDR4-2400 memory Up to 8GB for Processing System Unit + up to 2GB for Programmable Logic
Video Interfaces	Only on EG and EV MPSoCs: Integrated ARM Mali-400 MP2 Graphics Processing Unit Multicore 2D/3D acceleration at 667MHz OpenGL ES 1.1 / 2.0, OpenVG 1.0 / 1.1 On EV MPSoCs only, H.264/H.265 integrated video codec
Video Resolution	18- / 24-bit Dual Channel LVDS interface DP interface 2 x CSI interfaces
Mass Storage	DP: Up to 4096 x 2160 LVDS: Dependent on the IP implemented in the programmable logic
Networking	1 x external S-ATA Gen3 Channel SD interface QSPI Flash soldered on-board Optional eMMC 4.51 drive soldered on-board
USB	Up to 2 x Gigabit Ethernet interfaces
PCI-e	Up to 2 x Gigabit Ethernet interfaces
Audio	1x USB 2.0 OTG 2x USB 2.0 Host 2x USB 3.0 Host
Serial Ports	2 x UART Tx/Rx/RTS/CTS 2 x UART Tx/Rx 2 x CAN Bus
Other Interfaces	2x I2C Bus 2 x SPI interfaces 12 x GPIOs Boot select signals Power Management Signals
Power Supply	+3÷+5.25V <sub>DC</sub> +3.3V <sub>RTC</sub>
Operating System	Linux Android
Operating Temperature*	0°C ÷ +60°C (Commercial version) -40°C ÷ +85°C (Industrial version)
Dimensions	50 x 82 mm (1.97" x 3.23")

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.

SMARC

SMARC® with Intel® Atom® X, Celeron® J / N and  
Pentium® N Series (formerly Apollo Lake)

High performance, low power and feature-rich

JAGER

Available in Industrial  
Temperature Range

Processor	Intel® Atom™ <b>x7-E3950</b> Quad Core @1.6 GHz (Burst 2.0GHz), 2MB L2 Cache, 12W TDP Intel® Atom™ <b>x5-E3940</b> Quad Core @1.6 GHz (Burst 1.8GHz), 2MB L2 Cache, 9.5W TDP Intel® Atom™ <b>x5-E3930</b> Dual Core @1.3 GHz (Burst 1.8GHz), 2MB L2 Cache, 6.5W TDP Intel® Pentium® <b>N4200</b> Quad Core @1.1GHz (burst 2.5GHz), 2MB L2 Cache, 6W TDP Intel® Celeron® <b>N3350</b> Dual Core @1.1GHz (burst 2.4GHz), 2MB L2 Cache, 6W TDP Intel® Celeron® <b>J3455</b> , Quad Core @ 1.5GHz (Burst 2.3GHz), 2MB L2Cache, 10W TDP Intel® Celeron® <b>J3355</b> , Dual Core @ 2.0GHz (Burst 2.5GHz), 2MB L2Cache,10W TDP
Max Cores	4
Memory	Single- / Dual- / Quad- Channel Soldered Down LPDDR4-2400 memory, up to 8GB
Graphics	Up to 3 independent displays Integrated Intel® HD Graphics 500 / 505 HD Graphics controller, with up to 18 Execution Units 4K HW decoding and encoding of HEVC(H.265), H.264, VP8, SVC, MVC
Video Interfaces	eDP interface or Dual Channel 18/24bit LVDS interface through eDP-to-LVDS bridge HDMI or DP++ interface DP++ interface 2 x CSI interfaces
Video Resolution	HDMI, eDP up to 3840 x 2160 (4K) DP++ Up to 4096 x 2160 LVDS Up to 1920 x 1200
Mass Storage	1 x external S-ATA Gen3 Channel SD interface Optional eMMC 5.0 drive soldered on-board
Networking	Up to 2 x Gigabit Ethernet interfaces Intel® I210 or I211 Controller (MAC + PHY)
USB	6 x USB 2.0 Host Ports 2 x USB 3.0 Host Ports
PCI-e	4 x PCI-e Root Ports
Audio	HD Audio interface I2S Audio interface
Serial Ports	2x 2-wire HS-UARTs 2x 4-wire UARTs
Other Interfaces	Up to 14x GPIOs I2C Bus SM Bus 1x SPI interfaces LPC Bus FAN management Optional TPM 1.2 / 2.0 Power Management Signals
Power Supply	+5V <sub>DC</sub> and +3.3V <sub>RTC</sub>
Operating System	Microsoft® Windows 10 Enterprise (64 bit) Microsoft® Windows 10 IoT Core Linux Yocto Android
Operating Temperature*	0°C ÷ +60°C (Commercial version) -40°C ÷ +85°C (Industrial version)
Dimensions	50 x 82 mm

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.





Cross Platform Philosophy Development Kit for SMARC Rel. 2.0 / 2.1.1 compliant modules

SMARC DEV KIT



Cross-compatible platform with x86 and Arm solutions

SCHEMATICS PUBLICLY AVAILABLE



FEATURES OF CSM-B79

	Video Interfaces	LVDS/MIPI-DSI connector, interface shared with 2x eDP connectors Backlight control + LCD selectable voltages dedicated connector 2xDP++ connectors HDMI connector (can be used in alternative to 1xDP++) 2x CSI Camera input interfaces
	Mass Storage	SATA M 7p connector with dedicated power connector, interface shared with M.2 Socket 2 2230 / 2242 / 2260 Key B SSD slot microSD Card Slot
	Networking	Up to 2xDual RJ-45 Gigabit Ethernet connectors M.2 Socket1 2230 Key E Slot for WiFi/BT Modules (interface shared with PCI-e x 4 slot) M.2 Socket2 2260 / 3042 Key B Slot for WWAN Modem Modules (interface shared with PCI-e x 4 slot), connected to on-board microSIM slot
	USB Ports	1 x USB 3.0 type A Socket 1 x USB 2.0 type A Socket 1 x USB OTG micro-AB Socket 1 x USB 3.1 Type-C Socket
	PCI-e	PCI-e x4 slot, interface shared with M.2 Slots
	Audio	TRSS Mic In + Line Out Audio Jack Onboard I2S Audio Codec (TI TLV320AIC3204) + HD Audio Codec (Cirrus Logic CS4207) I2S Audio header
	Serial Ports	2 x CAN ports 2 x RS-232/RS-422/RS-485 configurable serial ports on internal pin header 2 x Serial ports (Tx/Rx signals only, TTL level) on feature pin header
	Other Interfaces	eSPI pin header + Flash Socket SPI pin header + Flash Socket I2C EEPROM Socket 4 x 7-segment LCD displays for POST codes Feature pin header with 2 x Serial ports, I2C, SM Bus, Watchdog and Power Management Signals GPIO / FuSa pin header FAN connector Optional Debug USB port on micro-B connector Boot selection switches JTAG connector Selector for SMARC 2.0 / 2.1 pinout compatibility
	Power Supply	9-24V through dedicated Mini-Fit Jr 2x2 power connector 6-17V through 2/3/4 Cell Smart Battery Connector RTC Coin cell battery holder
	Operating Temperature*	-40°C ÷ +85°C
	Dimensions	243.84 x 243.84mm (microATX)

\*All carrier board components must remain within the operating temperature at any and all times, including start-up; carrier operating temperature is independent of the module installed. Please refer to the specific module for more details. Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider specific cooling solutions for the final system.

Development kit for SMARC Modules



## COM EXPRESS® STANDARD ADVANTAGES



## COMPUTER-ON-MODULE APPROACH

Design investment limited to the carrier board | Consolidated standard form factor | Scalable and future-proof  
Long-term availability | Arm and x86 cross-compatibility | Multi-vendor solution | Highly configurable  
Innovative and upgradable | Accelerated time-to-market

## COM EXPRESS® INTERFACES

Interface	Type 6 (Min / Max)	Type 7 (Min / Max)
PCI Express Lanes 0 - 5	1 / 6	6 / 6
PCI Express Lanes 6 - 15	0 / 2	0 / 10
PCI Express Lanes 16 - 31	0 / 16	0 / 16
PCI Express Graphics (PEG)	0 / 1	NA
10G LAN Ports 0 - 3	N.A.	0 / 4
NC-SI	N.A.	0 / 1
1Gb LAN Port 0	1*	1*
DDIs 1 - 3	0 / 3	N.A.
LVDS Channel A	0 / 1	N.A.
LVDS Channel B	0 / 1	N.A.
eDP on LVDS 1st channel	0 / 1	N.A.
VGA Port	0 / 1	N.A.
Serial Ports	0 / 2	0 / 2

Interface	Type 6 (Min / Max)	Type 7 (Min / Max)
CAN interface on SER1	0 / 1	0 / 1
SATA Ports	1 / 4	0 / 2
HDA Digital Interface	0 / 1	N.A.
USB 2.0 Ports	4 / 8	4 / 4
USB0 Client	0 / 1	0 / 1
USB7 Client	0 / 1	N.A.
USB 3.0 Ports	0 / 4	0 / 4
LPC Bus or eSPI	1*	1*
SPI (Devices)	1 / 2	1 / 2
Rapid Shutdown	0 / 1	0 / 1
SDIO (muxed on GPIO)	0 / 1	0 / 1
General Purpose I/O	8 / 8	8 / 8
SMBus	1*	1*
I2C	1*	1*

Interface	Type 6 (Min / Max)	Type 7 (Min / Max)
Watchdog Timer	0 / 1	0 / 1
Speaker Out	1*	1*
Carrier Board BIOS Flash Support	0 / 1	0 / 1
Reset Functions	1*	1*
Trusted Platform Module	0 / 1	0 / 1
Thermal Protection	0 / 1	0 / 1
Battery Low Alarm	0 / 1	0 / 1
Suspend/Wake Signals	0 / 3	0 / 3
Power Button Support	1*	1*
Power Good	1*	1*
Sleep Input	0 / 1	0 / 1
Lid Input	0 / 1	0 / 1
Carrier Board Fan Control	0 / 1	0 / 1

\*Mandatory interface



COM Express Type 7

COM Express® Basic Type 7 with  
Intel® Xeon® D-1700 (formerly Ice Lake- D)

COM Express® form factor and high performance  
Intel® SoCs for secure IoT applications

JULIET



Available in Industrial Temperature Range

Processor	Intel Xeon® D-1700 family of processors Up to 10 cores, ~40 to 67W thermal design power (TDP)
Memory	Up to four DDR4 SODIMM slots on three DDR4 72-bit channels (up to 2x SODIMM slots on channel #0) Supporting DDR4-2400/2666/2933 memory (both ECC and non-ECC supported), up to 128GB Supports single-rank or dual-rank per SODIMM module
Mass Storage	2x SATA 3 channels
Networking	<ul style="list-style-type: none"><li>1x Gigabit Ethernet LAN port with NC-SI (Network Controller Sideband Interface) functionality, managed by an Intel® I21x Gigabit Ethernet Controller.</li><li>4x 10Gigabit Ethernet interfaces (10GBASE-KR), directly managed by the Xeon® D-1700 SoCs.</li></ul>
USB	4x Superspeed USB 5Gbps
PCI-e	16x PCI-e Gen4 lanes (up to 4x root ports) 16x PCI-e Gen3 lanes (up to 8x root ports)
Serial Ports	2x legacy UARTs, 16C550 compatible
Other Interfaces	I2C, SPI, SM Bus, LPC/eSPI bus
Security	Optional TPM 2.0 module on-board Intel® QuickAssist Technology 1.7 hardware acceleration for cryptography Intel® Boot Guard Intel® Total Memory Encryption – Multi-Tenant to protect physical memory and isolate VMs
Embedded Controller Functionalities	Watchdog timer I2C and external SMBus Advanced FAN management 4x GPI (general purpose inputs), 4x GPO (general purpose outputs) Power state management Voltage and temperature monitoring POST code redirection User data storage Board statistics: up-time, boot counter, reset cause log
BIOS	Dedicated embedded BIOS based on AMI Aptio V
Power Supply	+12V <sub>DC</sub> ± 10% and +5V <sub>SB</sub> (optional)
Operating System	Windows 10 IoT Enterprise Windows Server Wind River VxWorks Yocto Project Linux Linux LTS Kernel
Operating Temperature*	0°C ÷ +60°C (Commercial version) -40°÷+85°C (Industrial version)
Dimensions	120 x 95 mm (COM Express® Basic Form factor, Type 7 pinout)

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.

COM Express Type 7

COM Express® Basic Type 7 with  
AMD EPYC™ Embedded 3000 Series

Scalable offerings with outstanding  
performance and more connectivity

THEBE



Available in Industrial Temperature Range

Processor	AMD EPYC™ Embedded 3000 family of SoCs: <ul style="list-style-type: none"><li>AMD EPYC™ Embedded <b>3451</b>, Sixteen Core Dual Thread @ 2.14GHz (3.0 Boost), 32MB L3 shared Cache, TDP 80-100W</li><li>AMD EPYC™ Embedded <b>3351</b>, Twelve Core Dual Thread @ 1.9GHz (3.0 Boost), 32MB L3 shared Cache, TDP 60-80W</li><li>AMD EPYC™ Embedded <b>3251</b>, Eight Core Dual Thread @ 2.5GHz (3.1 Boost), 16MB L3 shared Cache, TDP 55W</li><li>AMD EPYC™ Embedded <b>3201</b>, Eight Core Single Thread @ 1.5GHz (3.1 Boost), 16MB L3 shared Cache, TDP 30W</li><li>AMD EPYC™ Embedded <b>3151</b>, Quad Core Dual Thread @ 2.7GHz (2.9 Boost), 16MB L3 shared Cache, TDP 45W</li><li>AMD EPYC™ Embedded <b>3101</b>, Quad Core Single Thread @ 2.1GHz (2.9 Boost), 8MB L3 shared Cache, TDP 35W</li><li>AMD EPYC™ Embedded <b>3255</b>, Eight Core Dual Thread @ 2.5GHz (3.1 Boost), 16MB L3 shared Cache, TDP 55W, industrial grade</li></ul>
Memory	Up to 4x DDR4 SO-DIMM Slots supporting DDR4-2666 Memory (both ECC and not-ECC supported), up to 128GB
Mass Storage	2x S-ATA Gen3 Channels
Networking	<ul style="list-style-type: none"><li>1x Gigabit Ethernet LAN port with NC-SI (Network Controller Sideband Interface) functionality, managed by an Intel® I210 Gigabit Ethernet Controller</li><li>4x 10Gigabit Ethernet interfaces (10GBASE-KR), directly managed by the EPYC™ SoCs</li></ul>
USB	4 x USB 3.1 Host ports (SS + USB 2.0 interfaces)
PCI-e	24x PCI-e Gen3 lanes
Serial Ports	2x legacy UARTs, 16C550 compatible
Other Interfaces	SPI, SM Bus, LPC bus
Security	Optional TPM 2.0 module on-board AMD Secure Processor for Crypto Co-processing Hardware Validated Boot capabilities Secure Memory Encryption Secure Encrypted Virtualization
Embedded Controller Functionalities	Multi-Stage Watchdog Timer 2x I2C Advanced FAN management 4x GPI, 4 x GPO Power State Management Hardware and temperature monitoring POST Code redirection User Data Storage Board statistics: up-time, boot counter, reset cause log
BIOS	Dedicated embedded BIOS based on AMI Aptio V
Power Supply	+12V <sub>DC</sub> ± 10% and +5V <sub>SB</sub> (optional)
Operating System	Microsoft® Windows 10 Microsoft® Windows Server 2016 Linux OS 64-bit
Operating Temperature*	0°C ÷ +60°C (Commercial version) -40°÷+85°C (Industrial Range, when available)
Dimensions	125mm x 95mm

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.





Cross Platform **Dev Kit** compatible with  
**x86 and Arm** COM Express® Type 7 modules

Platform independent kit for fast  
Time-to-market

#### COM EXP T7 DEV KIT



Cross-compatible  
platform with x86  
and Arm solutions

SCHEMATICS  
PUBLICLY AVAILABLE



#### FEATURES OF xCOMe-C79

Mass Storage	2x S-ATA 7p M connectors µSD Card slot (interface multiplexed with GPIO header)
Networking	1x GbEthernet RJ-45 connector 4x 10Gbase-KR interfaces on OCP Type-C connector 4x MDIO I2C interfaces on internal pin header 4x SDP interfaces on SMA RF connectors
USB	4x USB 3.1 Host ports on Dual Type-A sockets
PCI-e	2x PCI-e x4 Slots 1x PCI-e x8 Slot 1x PCI-e x16 Slot
Serial Ports	2 x RS-232 ports on dedicated pin header (from module)
Other Interfaces	BMC connector with SM Bus, I2C, LPC, 1x USB 2.0, 1x PCI-e x1, NCSI signals 4 x GPI + 4 x GPO pin header (interface multiplexed with µSD slot) SPI Flash Socket Button / LEDs front panel header 4-pin tachometric FAN connector I2C + SM Bus on feature Pin header I2C Flash Socket SM Bus Smart Battery Connector 4 x 7-segment LCD displays for POST codes LPC/eSPI internal header USB Overcurrent header JTAG connector FuSa header SPI Flash header Buzzer
Power Supply	ATX 24 poles connector for carrier board working only Auxiliary 12V connector for carrier board working only 12 VDC power in connector for COM Express module's working Cabled Coin-cell connector for RTC
Operating Temperature*	0°C ÷ +60°C (Commercial version)
Dimensions	305x244mm (ATX form factor, 12" x 9.6")

\*All carrier board components must remain within the operating temperature at any and all times, including start-up; carrier operating temperature is independent of the module installed. Please refer to the specific module for more details. Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider specific cooling solutions for the final system.

## Development kit for COM Express® Modules



COM Express® Compact Type 6 with  
**11th Gen Intel® Core™** (formerly **Tiger Lake UP3**)

High-performance, responsive CPU and GPU  
compute in COM Express® Compact form factor

#### CALYPSO



Processor	<b>Intel® Core™ i7-118567E</b> , Quad Core @2.8GHz (4.4GHz Turbo Boost), 12MB Cache, 28W TDP (12W cTDP), with Hyperthreading <b>Intel® Core™ i5-114567E</b> , Quad Core @2.6GHz (4.1GHz Turbo Boost), 8MB Cache, 28W TDP (12W cTDP), with Hyperthreading <b>Intel® Core™ i3-111564E</b> , Dual Core @3.0GHz (3.9GHz Turbo Boost), 6MB Cache, 28W TDP (12W cTDP), with Hyperthreading <b>Intel® Core™ i7-11856RE</b> , Quad Core @2.8GHz (4.4GHz Turbo Boost), 12MB Cache, with IBECC, 28W TDP (12W cTDP), with Hyperthreading - Industrial <b>Intel® Core™ i5-11456RE</b> , Quad Core @2.6GHz (4.1GHz Turbo Boost), 8MB Cache, with IBECC, 28W TDP (12W cTDP), with Hyperthreading - Industrial <b>Intel® Core™ i3-111564E</b> , Dual Core @3.0GHz (3.9GHz Turbo Boost), 6MB Cache, with IBECC, 28W TDP (12W cTDP), with Hyperthreading - Industrial
Chipset	Integrated Intel® PCH-LP
Memory	Two DDR4 SO-DIMM slots supporting DDR4-3200 memory, up to 64GB IBECC DDR4 memory modules supported only with Intel® Core™ Industrial SoCs
Graphics	Intel® Iris® Xe Graphics, up to 96 Execution Units Up to 4 independent displays supported Support DirectX 12, OpenGL 4.6, OpenCL 3.0 and Vulkan 1.2 HW accelerated video decode AVC/H.264, HEVC/H.265, VP81, VP9, AV1 HW accelerated video encode AVC/H.264, HEVC/H.265, VP81, VP9
Video Interfaces	Up to 3x Digital Display Interfaces (DDIs), supporting DP 1.2, eDP 1.4, HDMI 1.4, DVI 1 x eDP 1.4 or Single/Dual-Channel 18-/24-bit LVDS interface 1 x VGA interface
Video Resolution	eDP, DP: up to 5120x3200 @60Hz 24bpp / 7680x4320 @60Hz 30bpp with DSC HDMI: up to 4096x2160 @24Hz, 24bpp LVDS: up to 1920x1200 @60Hz VGA: up to 2048 x 1536 @50Hz
Mass Storage	2x SATA Gen3 channels 2x PCI-e x4 ports available for M.2 NVMe drives
Networking	Gigabit Ethernet interface Intel® I225 GbE controller
USB	4x SuperSpeed USB 5Gbps host ports 8x USB 2.0 Host ports
PCI-e	8x PCI-e x1 Gen3 lanes PCI-express Graphics (PEG) x4 Gen4
Audio	HD audio interface
Serial Ports	2x UARTs
Other Interfaces	SPI, I2C, SM bus, thermal management, FAN management LPC bus Optional TPM 2.0 on-board LID#/SLEEP#/PWRBTN#, Watchdog 4x GPI, 4x GPO
Power Supply	+12VDC ± 10%, +5VSB (optional), +3VRTC (optional)
Operating System	Microsoft® Windows 10 Microsoft® Windows 10 IoT Core Linux
Operating Temperature*	0°C ÷ +60°C (Commercial) -40°C ÷ +85°C (Industrial)
Dimensions	95 x 95 mm (COM Express® Compact Form factor, Type 6 pinout)

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.



COM Express® Compact Type 6 with  
**AMD Ryzen™ Embedded V2000**

High performance AMD Ryzen™ core for graphics  
and compute demanding edge applications

#### OPHELIA



Processor	<b>AMD Ryzen™ Embedded V2748</b> with AMD Radeon™ Graphics with 7 CU, Eight Core Dual Thread @ 2.9GHz (4.15 Boost), TDP 35-54W <b>AMD Ryzen™ Embedded V2718</b> with AMD Radeon™ Graphics with 7 CU, Eight Core Dual Thread @ 1.7GHz (4.15 Boost), TDP 10-25W <b>AMD Ryzen™ Embedded V2546</b> with AMD Radeon™ Graphics with 6 CU, Six Core Dual Thread @ 3GHz (3.95 Boost), TDP 35-54W <b>AMD Ryzen™ Embedded V2516</b> with AMD Radeon™ Graphics with 6 CU, Six Core Dual Thread @ 2.1GHz (3.95 Boost), TDP 10-25W
Memory	Two DDR4 SO-DIMM Slots supporting DDR4-3200, ECC and non- ECC memory, up to 64GB
Graphics	AMD Radeon™ Graphics GPU with up to 7 Compute Units Up to 4 independent displays supported Support DirectX 12, OpenGL 4.6, OpenCL 2.1 and Vulkan HW accelerated video decode VP9 (8 and 10 bits), H.264/AVC (8bits), H.265/HEVC (8 and 10 bits), JPEG HW accelerated video encode H.264/AVC (8bits), H.265/HEVC (8 and 10 bits), JPEG
Video Interfaces	Up to 3 x Digital Display Interfaces (DDIs), supporting DVI, DP 1.4, HDMI 2.1 1 x eDP 1.3 or single/dual-channel 18-/24-bit LVDS interface
Video Resolution	eDP, DP up to 4096x2160 @60Hz 10b with DSC 1.2 (HBR3) HDMI up to 4096x2160 @ 60Hz LVDS up to 1920x1200 @ 60Hz
Mass Storage	2 x S-ATA Gen3 Channels
Networking	Gigabit Ethernet interface with Intel® i21x GbE controller Optional M.2 1216 Wi-Fi 802.11ac and BTLE 5.0 on-board
USB	1x SuperSpeed USB 10Gbps host port 3x SuperSpeed USB 5Gbps host ports 8x 2.0 host ports
PCI-e	8x PCI-e x1 Gen3 lanes PCI-express Graphics (PEG) x8 Gen3
Audio	HD Audio interface
Serial Ports	2x UARTs
Other Interfaces	SPI, I2C, SM Bus, thermal management, FAN management LPC bus Optional TPM 2.0 on-board LID#/SLEEP#/PWRBTN#, Watchdog 4x general purpose input (GPI), 4x general purpose input (GPI)
Power Supply	+12V <sub>DC</sub> ± 10%, +5V <sub>SB</sub> (optional), +3VRTC (optional)
Operating System	Microsoft® Windows 10 Linux
Operating Temperature*	0°C to +60°C (commercial version)
Dimensions	95 x 95 mm (COM Express® Compact Form factor, Type 6 pinout)

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider application-specific cooling solutions for the packaged system to keep the heatspreader temperature in the range indicated.



COM Express® Compact Type 6 with  
**AMD Ryzen™ Embedded R1000**

Low-end AMD Ryzen™ on COM Express®  
Type 6 Compact

#### METIS



Processor	AMD Ryzen™ Embedded <b>R1606G</b> with GPU AMD Radeon™ Vega 3, Dual Core Four Thread @ 2.6GHz (3.5 Boost), TDP 12-25W AMD Ryzen™ Embedded <b>R1505G</b> with GPU AMD Radeon™ Vega 3, Dual Core Four Thread @ 2.4GHz (3.3 Boost), TDP 12-25W AMD Ryzen™ Embedded R1305G with GPU AMD Radeon™ Vega 3, Dual Core Four Thread @ 1.5GHz (2.8 Boost), TDP 8-10W
Max Cores	2
Memory	Two DDR4 SO-DIMM Slots supporting DDR4-2400 Memory, up to 32GB
Graphics	AMD Radeon™ Vega 3 GPU with 3 Compute Units DirectX® 12 supported H.265 (10-bit) decode and 8-bit video encode VP9 decode 3 independent displays supported
Video Interfaces	Up to 3 x Digital Display Interfaces (DDIs), supporting DP 1.3, DVI and HDMI 1.4/2.0 eDP or Single/Dual-Channel 18-/24-bit LVDS interface (factory alternatives to third DDI port)
Video Resolution	DDIs, eDP up to 4K LVDS up to 1920 x 1200 @ 60Hz
Mass Storage	2 x S-ATA Gen3 Channels
Networking	Gigabit Ethernet interface Intel® I21x family GbE Controller
USB	Up to 4 x USB 3.0 Host ports 8 x USB 2.0 Host ports
PCI-e	2 x PCI-e x1 Gen3 lanes Additional 3rd PCI-e x1 Gen3 lane or 3x PCI-e x1 Gen2 lanes (factory alternatives) PCI-express Graphics (PEG) x4
Audio	HD Audio interface
Serial Ports	2 x UARTs
Other Interfaces	SPI, I2C, SM Bus, LPC bus, FAN management Optional TPM 2.0 module on-board 4 x GPI, 4 x GPO
Power Supply	+12V <sub>DC</sub> ± 10% and +5V <sub>SB</sub> (optional)
Operating System	Windows 10 64-bit Linux
Operating Temperature*	0°C ÷ +60°C (Commercial version)
Dimensions	95 x 95 mm (Com Express Compact Form factor, Type 6 pinout)

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.





## COM Express Type 6

COM Express® Compact Type 6 with  
**8th Gen Intel® Core™** and **Celeron™ U-series**  
(formerly **Whiskey Lake-U**)

Low power multi-core Intel® architecture  
for mobile applications

### LARISSA



Processor	Intel® Core™ <b>i7-8665UE</b> , Quad Core @ 1.7GHz (Turbo Boost 4.4GHz) with HT, 8MB Cache, 15W TDP (12.5W .25W cTDP) Intel® Core™ <b>i5-8365UE</b> , Quad Core @ 1.6GHz (Turbo Boost 4.1GHz) with HT, 6MB Cache, 15W TDP (12.5W .25W cTDP) Intel® Core™ <b>i3-8145UE</b> , Dual Core @ 2.2GHz (Turbo Boost 3.9GHz) with HT, 4MB Cache, 15W TDP (12.5W .25W cTDP) Intel® Celeron® <b>4305UE</b> , Dual Core @ 2.0GHz, 2MB Cache, 15W TDP)
Max Cores	4
Max Thread	8
Memory	Two DDR4 SO-DIMM Slots supporting DDR4-2400 Memory, up to 64GB
Graphics	Intel® UHD Graphics 620 (Core™ processors), 610 (Celeron™ processor) Up to 3 independent display supported DirectX 12, OpenGL 4.5, and OpenCL 2.1 support HW accelerated video decode MPEG2, VC1/WMV9, AVC/H.264, VP8, JPEG/ MJPEG, HEVC/H.265 (8 and 10 bits), VP9 HW accelerated video encode MPEG2, AVC/H.264, VP8, JPEG, HEVC/H.265, VP9
Video Interfaces	Up to 2 x Digital Display Interfaces (DDIs), supporting DP 1.2, eDP 1.4, HDMI 1.4 and DVI eDP <b>or</b> Single/Dual-Channel 18-/24- bit LVDS interface Optional VGA interface (excludes DDI port #2)
Video Resolution	eDP, DP: up to 4096 x 2304 @60Hz HDMI: up to 4096 x 2160 @30Hz LVDS: up to 1920 x 1200 @ 60Hz VGA: up to 2048 x 1536 @ 50Hz (reduced blanking)
Mass Storage	Up to 3 x S-ATA Gen3 Channels Optional eMMC 5.1 drive on-board microSD Card slot on-board
Networking	Gigabit Ethernet interface Intel® I219-LM GbE Controller
USB	4 x USB 3.1 Host ports 8 x USB 2.0 Host ports
PCI-e	Up to 8 x PCI-e x 1 lanes Optional PCI-express Graphics (PEG) x2 or x4 Possible configurations (factory alternative): <ul style="list-style-type: none"><li>• 8 ports PCI-e x1</li><li>• 6 ports PCI-e x 1 + PEG x2</li><li>• 5 ports PCI-e x 1 + PEG x4</li><li>• 4 ports PCI-e x 1 + PEG x4 + 3rd SATA</li></ul>
Audio	HD Audio Interface
Serial Ports	2x UARTs
Other Interfaces	SPI, I2C, SM Bus, LPC bus, FAN management Optional TPM 2.0 module on-board LID#/SLEEP#/PWRBTN#, Watchdog 4x GPI, 4 x GPO
Power Supply	+12V <sub>DC</sub> ± 10% and +5V <sub>SB</sub> (optional)
Operating System	Microsoft Windows 10 Enterprise / IoT Linux Yocto
Operating Temperature*	0°C ÷ +60°C (Commercial version)
Dimensions	95 x 95 mm (Com Express™ Compact Form factor, Type 6 pinout)

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/ or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.

## COM Express Type 6

COM Express® Compact Type 6 with  
**Intel® Atom® X, Celeron® J / N** and **Pentium® N Series**  
(formerly **Apollo Lake**)

Rugged solution for industrial environment

### MIRANDA



Available in Industrial Temperature Range

Processor	Intel® Atom™ <b>x5-E3930</b> Dual Core @1.3 GHz (Burst 1.8GHz), 2MB L2 Cache, 6.5W TDP Intel® Atom™ <b>x5-E3940</b> Quad Core @1.6 GHz (Burst 1.8GHz), 2MB L2 Cache, 9.5W TDP Intel® Atom™ <b>x7-E3950</b> Quad Core @1.6 GHz (Burst 2.0GHz), 2MB L2 Cache, 12W TDP Intel® Pentium® <b>N4200</b> Quad Core @1.1GHz (Burst 2.5GHz), 2MB L2 Cache, 6W TDP Intel® Celeron® <b>J3455</b> , Quad Core @1.5GHz (Burst 2.3GHz), 2MB L2Cache, 10W TDP Intel® Celeron® <b>J3355</b> , Dual Core @2.0GHz (Burst 2.5GHz), 2MB L2Cache, 10W TDP
Max Cores	4
Max Thread	4
Memory	Two DDR3L SO-DIMM Slots supporting DDR3L-1866 non-ECC Memory, up to 8GB
Graphics	Integrated Intel® HD Graphics 500 series controller with up to 18 Execution Units Three Independent displays supported HW decoding of HEVC(H.265), H.264, MVC, VP8, VP9, MPEG2, VC-1, WMV9, JPEG/MJPEG formats HW encoding of HEVC(H.265), H.264, MVC, VP8, VP9 and JPEG/MPEG formats
Video Interfaces	Up to 2 x Digital Display Interfaces (DDIs), supporting DP 1.2, DVI and HDMI 1.4b eDP 1.3 or Single/Dual-Channel 18-/24- bit LVDS interface optional VGA interface through a DP-to-VGA bridge
Video Resolution	DP: Up to 4096 x 2160 @60HZ eDP: Up to 3840 x 2160 @60Hz HDMI: Up to 3840 x 2160 @30Hz LVDS, VGA: Up to 1920 x 1200 @ 60Hz
Mass Storage	Optional eMMC 5.0 drive soldered on-board 2 x external S-ATA Gen3 Channels microSD Card Slot onboard
Networking	Optional Gigabit Ethernet interface Intel® I210 or I211 GbE Controller (MAC + PHY)
USB	Up to 4 x USB 3.0 Host ports 8 x USB 2.0 Host ports
PCI-e	Up to 5 x PCI-e x 1 Gen2 lanes
Audio	HD Audio Interface
Serial Ports	2x UARTs
Other Interfaces	SPI, I2C, SM Bus, Thermal Management, FAN management LPC bus Optional TPM 2.0 on-board LID#/SLEEP#/PWRBTN#, Watchdog 4x GPI, 4 x GPO
Power Supply	+12V <sub>DC</sub> ± 10% and +5V <sub>SB</sub> (optional)
Operating System	Microsoft® Windows 10 Enterprise (64-bit) Microsoft® Windows 10 IoT core Wind River Linux (64 bit) Yocto (64 bit) Android (planning)
Operating Temperature*	0°C ÷ +60°C (Commercial version) -40°C ÷ +85°C (Industrial version)
Dimensions	95 x 95 mm (Com Express™ Compact Form factor, Type 6 pinout)

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/ or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.



## COM Express Type 6

COM Express® Basic Type 6 with  
**Intel® 8th and 9th Gen Core™/ Xeon® / Celeron®**  
(formerly **Coffee Lake** and **Coffee Lake Refresh**)

Exceptional platform performance with up to  
six cores for more processing power

### OBERON



Processor	Intel® 8th generation Core™ / Xeon® (formerly Coffee Lake H) CPUs: <ul style="list-style-type: none"><li>• Intel® Core™ <b>i7-8850H</b>, Six Core @ 2.6GHz (4.3GHz Max 1 Core Turbo), 9MB Cache, 45W TDP (35W cTDP), with HyperThreading</li><li>• Intel® Core™ <b>i5-8400H</b>, Quad Core @ 2.5GHz (4.2GHz Max 1 Core Turbo), 8MB Cache, 45W TDP (35W cTDP), with HyperThreading</li><li>• Intel® Core™ <b>i3-8100H</b>, Quad Core @ 3.0GHz, 6MB Cache, 45W TDP (35W cTDP)</li><li>• Intel® Xeon® <b>E-2176M</b>, Six Core @ 2.7GHz (4.4GHz Max 1 Core Turbo), 12MB Cache, 45W TDP (35W cTDP), with HyperThreading</li></ul> Intel® 9th generation Core™ / Xeon® / Celeron® (formerly Coffee Lake Refresh) CPUs: <ul style="list-style-type: none"><li>• Intel® Xeon® <b>E-2276ME</b> Six Core @2.8GHz (4.5GHz Max 1 Core Turbo), 12MB Cache, 45W TDP (35W cTDP), with Hyperthreading</li><li>• Intel® Xeon® <b>E-2276ML</b> Six Core @2.0GHz (4.2GHz Max 1 Core Turbo), 12MB Cache, 25W TDP, with Hyperthreading</li><li>• Intel® Xeon® <b>E-2254ME</b> Quad Core @2.6GHz (3.8GHz Max 1 Core Turbo), 8MB Cache, 45W TDP (35W cTDP), with Hyperthreading</li><li>• Intel® Xeon® <b>E-2254ML</b> Quad Core @1.7GHz (3.5GHz Max 1 Core Turbo), 8MB Cache, 25W TDP, with Hyperthreading</li><li>• Intel® Core™ <b>i7-9850HE</b>, Six Core @2.7GHz (4.4GHz Max 1 Core Turbo), 9MB Cache, 45W TDP (35W cTDP), with Hyperthreading</li><li>• Intel® Core™ <b>i7-9850HL</b>, Six Core @1.9GHz (4.1GHz Max 1 Core Turbo), 9MB Cache, 25W TDP, with Hyperthreading</li><li>• Intel® Core™ <b>i3-9100H</b>, Quad Core @1.6GHz (2.9GHz Max 1 Core Turbo), 6MB Cache, 25W TDP</li><li>• Intel® Celeron® <b>G4930E</b>, Dual Core @2.4GHz, 2MB Cache, 35W TDP</li><li>• Intel® Celeron® <b>G4932E</b>, Dual Core @1.9GHz, 2MB Cache, 25W TDP</li></ul>
Max Cores	6
Max Thread	12
Chipset	Intel® QM370, HM370 or CM246 PCH
Memory	Two DDR4 SO-DIMM Slots supporting DDR4-2666 I Memory, up to 64GB ECC DDR4 memory modules supported only with Xeon®, Core™ i3 and Celeron® CPUs combined with CM246 PCH
Graphics	Intel® UHD Graphics 630/P630 architecture, up to 48 Execution Units I Up to 3 independent displays supported I DirectX 12, OpenGL 4.5, and OpenCL 2.1 support I HW accelerated video decode MPEG2, VC1/WMV9, AVC/H.264, VP8, JPEG/MJPEG, HEVC/H.265 (8-/10-bit), VP9 I HW accelerated video encode MPEG2, AVC/H.264, VP8, JPEG, HEVC/H.265, VP9
Video Interfaces	Up to 3 x Digital Display Interfaces (DDIs), supporting DP 1.2, DVI, HDMI 1.4 eDP 1.4 <b>or</b> Single/Dual-Channel 18-/24-bit LVDS interface <b>or</b> LVDS + VGA interface
Video Resolution	eDP, DP up to 4096x2304 @ 60Hz, 24bpp HDMI up to 4096x2160 @ 24Hz, 24bpp (HDMI 1.4) LVDS, VGA up to 1920x1200 @ 60Hz
Mass Storage	4 x S-ATA Gen3 Channels I SD interface (shared with GPI/Os)
Networking	Gigabit Ethernet interface I Intel® I219-LM GbE Controller
USB	4 x USB 3.0 Host ports I 8 x USB 2.0 Host ports
PCI-e	8 x PCI-e x 1 Gen3 lanes I PCI-express Graphics (PEG) Gen3 x16
Audio	HD Audio interface
Serial Ports	2 x UARTs
Other Interfaces	SPI, I2C, SM Bus, Thermal Management, FAN management I LPC bus I Optional TPM 2.0 on-board I LID#/SLEEP#/PWRBTN#, Watchdog I 4 x GPI, 4 x GPO (pins shared with SD interface)
Power Supply	+12V <sub>DC</sub> ± 10% and +5V <sub>SB</sub> (optional)
Operating System	Microsoft® Windows 10 I Linux
Operating Temperature*	0°C ÷ +60°C (Commercial version)
Dimensions	125 x 95 mm (COM Express™ Basic Form factor, Type 6 pinout)

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/ or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.

## COM Express Type 6

COM Express® Compact Type 6 with  
**AMD Ryzen™ Embedded V1000**

Next Generation x86 “Zen” Core and  
elite GPU performance

### CHARON



Available in Industrial Temperature Range

Processor	AMD Ryzen™ Embedded <b>V1807B</b> with AMD Radeon™ Vega 11 Graphics, Quad Core Dual Thread @ 3.35GHz (3.8 Boost), TDP 35-54W AMD Ryzen™ Embedded <b>V1756B</b> with AMD Radeon™ Vega 8 Graphics, Quad Core Dual Thread @ 3.25GHz (3.6 Boost), TDP 35-54W AMD Ryzen™ Embedded <b>V1605B</b> with AMD Radeon™ Vega 8 Graphics, Quad Core Dual Thread @ 2.0GHz (3.6 Boost), TDP 12-25W AMD Ryzen™ Embedded <b>V1202B</b> with AMD Radeon™ Vega 3 Graphics, Dual Core Dual Thread @ 2.3 GHz (3.2 Boost), TDP 12-25W
Max Cores	4
Memory	Up to two DDR4 SO-DIMM Slots supporting DDR4-3200 ECC and non- ECC Memory modules (DDR4-2400 with V1605B, V1202B and V1404I) Up to 16GB @ 3200Mhz, up to 32GB @ 2400MHz supported
Graphics	AMD Radeon™ Vega GPU with up to 11 Compute Units DirectX® 12 supported H.265 (10-bit) decode and 8-bit video encode VP9 decode 4 independent displays supported
Video Interfaces	3 x Digital Display Interfaces (DDIs), supporting DP 1.3, DVI and HDMI 1.4/2.0 eDP <b>or</b> Single/Dual-Channel 18-/24- bit LVDS interface
Video Resolution	DDIs, eDP up to 4K LVDS up to 1920 x 1200
Mass Storage	2 x S-ATA Gen3 Channels
Networking	Gigabit Ethernet interface Intel® I21x family GbE Controller
USB	4 x USB 3.0 Host ports 8 x USB 2.0 Host ports
PCI-e	Up to 4x PCI-e x1 Gen3 lanes + 2 x PCI-e x1 Gen2 ports PCI-express Graphics (PEG) x 8 Gen3
Audio	HD Audio interface
Serial Ports	2 x UARTs
Other Interfaces	SPI, I2C bus, SM Bus, LPC bus, FAN management LID#/SLEEP#/PWRBTN#, Watchdog 4x GPI, 4 x GPO Optional TPM 1.2 module on-board
Power Supply	+12V <sub>DC</sub> ± 10% and +5V <sub>SB</sub> (optional)
Operating System	Microsoft® Windows 10 Linux
Operating Temperature*	0°C ÷ +60°C (Commercial version) -40°C ÷ +85°C (Industrial version)
Dimensions	95 x 95 mm (COM Express™ Compact Form factor, Type 6 pinout)

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/ or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.





## COM Express Type 6

COM Express® Basic Type 6 with  
**Intel® 6th and 7th Gen Core™ / Xeon®**  
(formerly **Skylake** and **Kaby Lake**)

When high graphics and Hyper-threading matter

### TARVOS



Processor	Intel® Core™ <b>i3-6102E</b> , Dual Core @ 1.9GHz, 3MB Cache, 25W TDP Intel® Core™ <b>i3-6100E</b> , Dual Core @ 2.7GHz, 3MB Cache, 35W TDP Intel® Core™ <b>i5-6442EQ</b> , Quad Core @ 1.9GHz (2.7GHz in Turbo Boost), 6MB Cache, 25W TDP Intel® Core™ <b>i5-6440EQ</b> , Quad Core @ 2.7GHz (3.4GHz in Turbo Boost), 6MB Cache, 45W TDP Intel® Core™ <b>i7-6822EQ</b> , Quad Core @ 2GHz (2.8GHz in Turbo Boost), 8MB Cache, 25W TDP Intel® Core™ <b>i7-6820EQ</b> , Quad Core @ 2.8GHz (3.5GHz in Turbo Boost), 8MB Cache, 45W TDP Intel® Xeon® <b>E3-1505M V5</b> , Quad Core @ 2.8GHz (3.7GHz in Turbo Boost), 8MB Cache, 45W TDP Intel® Xeon® <b>E3-1515M V5</b> , Quad Core @ 2.8 GHz, 8MB Cache, 45W TDP (ECC supported), GT4E LINE (DO) with OPC (AO)
Max Cores	4
Max Thread	8 (HT not available with 6th Generation Core™ i5 and 7th Generation Core™ i3/i5 Processors)
Chipset	Skylake Platform: Intel® QM170, HM170 or CM236 PCH Kabylake Platform: Intel® QM175 or CM238 PCH
Memory	Up to two DDR4 SO-DIMM Slots supporting DDR4-2133 (DDR4-2400 for 7th Generation processors) Memory   ECC DDR4 memory modules supported only with Xeon® and Core™ i3 processors combined with CM236 / CM238 PCH
Graphics	Intel® HD Graphics 530 (6th Generation Core™ processors), P530 (6th Generation Xeon® processors)   Intel® HD Graphics 630 (7th Generation Core™ processors), P630 (7th Generation Xeon® processors)   Up to 3 independent displays supported   DirectX® 12.1, OpenGL 4.4, and OpenCL 2.0 support   HW accelerated video decode MPEG2, VC1 / WMV9, AVC / H.264, VP8, JPEG / MJPEG, HEVC / H.265, VP9   HW accelerated video encode MPEG2, AVC / H.264, VP8, JPEG / MJPEG, HEVC / H.265, VP9
Video Interfaces	Up to 3 x Digital Display Interfaces (DDIs), supporting DP 1.2, DVI and HDMI 1.4   eDP or Single / Dual-Channel 18- / 24- bit LVDS interface or LVDS + VGA interface   PCI-express Graphics (PEG) Gen3 x16
Video Resolution	eDP, DP: up to 4096x2304 @60Hz, 24bpp HDMI: up to 4096x2160 @60Hz, 24bpp LVDS, VGA: up to 1920 x 1200 @60Hz
Mass Storage	4 x SATA Gen3 Channels
Networking	Gigabit Ethernet interface   Intel® I219-LM GbE Controller
USB	4 x USB 3.0 Host ports 8 x USB 2.0 Host ports
PCI-e	8 x PCI-e x1 Gen3 lanes
Audio	HD Audio Interface
Serial Ports	2 x UARTs
Other Interfaces	2 x SPI, I2C, SM Bus, LPC Bus, 2 x Express Card, FAN management   Optional TPM 1.2   LID# / SLEEP# / PWRBTN#, Watchdog   4x GPI, 4 x GPO
Power Supply	+12V <sub>DC</sub> ± 10% and +5V <sub>SB</sub> (optional)
Operating System	Microsoft® Windows 7 (only for Skylake)   Microsoft® Windows 10   Linux
Operating Temperature*	0°C ÷ +60°C (Commercial version) -40°C / +70°C (Extended Temperature Range)
Dimensions	125 x 95 mm (Com Express™ Basic Form factor, Type 6 pinout)

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/ or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.

## COM Express Type 6

COM Express® Compact Type 6 with  
**Intel® Atom® E3800 and Celeron®**  
(formerly **Bay Trail**)

Versatile and rugged

### CHANDRA



Processor	Intel® Atom™ <b>E3845</b> , Quad Core @1.91GHz, 2MB Cache, 10W TDP Intel® Atom™ <b>E3827</b> , Dual Core @1.75GHz, 1MB Cache, 8W TDP Intel® Atom™ <b>E3826</b> , Dual Core @1.46GHz, 1MB Cache, 7W TDP Intel® Atom™ <b>E3825</b> , Dual Core @1.33GHz, 1MB Cache, 6W TDP Intel® Atom™ <b>E3815</b> , Single Core @1.46GHz, 512KB Cache, 5W TDP Intel® Celeron® <b>J1900</b> , Quad Core @2.0GHz, 2MB Cache, 10W TDP Intel® Celeron® <b>N2930</b> , Quad Core @1.83GHz, 2MB Cache, 7.5W TDP
Max Cores	4
Memory	DDR3L non-ECC SO-DIMM slots, 4GB modules supported per each slot E3845, E3827, J1900, N2930: up to 8GB Dual-Channel DDR3L 1333MHz E3826: up to 8GB Dual-Channel DDR3L 1066MHz N2807: up to 4GB Single-Channel DDR3L 1333MHz E3825, E3815: up to 4GB Single-Channel DDR3L 1066MHz
Graphics	Integrated Intel® HD Graphics 4000 series controller Dual independent display support HW decoding of H.264, MPEG2, MVC, VC1, VP8, MJPEG formats HW encoding of H.264, MPEG2 and MVC formats
Video Interfaces	1 x Digital Display Interface (DDI) able to drive HDMI / DVI / DP++ interface Additional DDI, can be switched to manage embedded Display Port or 18 / 24 bit single / dual channel LVDS interface CRT interface
Video Resolution	CRT Interface: Up to 2560x1600@60Hz HDMI: Up to 1920x1080p@60Hz Display Port, eDP: Up to 2560x1600@60Hz Optional LVDS interface: Up to 1920x1200@60Hz
Mass Storage	Optional eMMC drive soldered on-board 2 x external SATA channels SD Card interface (multiplexed with GPIO signals)
Networking	Optional Gigabit Ethernet interface (uses one PCI-e lane)
USB	7 x USB 2.0 Host ports 4 x USB 3.0 Host ports
Audio	HD Audio interface
PCI-e	Up to 4 x PCI-e x1 Gen2 lanes
Serial Ports	2 x Serial ports (TX / RX only, TTL interface)
Other Interfaces	2 x Express Card interfaces I2C Bus LPC Bus SM Bus 4 x GPI, 4 x GPO Thermal / FAN management Watch Dog timer Power Management Signals
Power Supply	+12V <sub>DC</sub> ± 10% and + 5V <sub>SB</sub> (optional)
Operating System	Microsoft® Windows 7 (32/64 bit) Microsoft® Windows 8 (32/64 bit) Microsoft® Windows 8.1 (32/64 bit) Microsoft® Windows 10 (32/64 bit) Microsoft® Windows 10 IoT Microsoft® Windows Embedded Standard 7 (32/64 bit) Linux (32/64 bit) Yocto
Operating Temperature*	0°C ÷ +60°C (Commercial version) -40°C ÷ +85°C (Industrial version)
Dimensions	95 x 95 mm (Com Express™ Compact Form factor, Type 6 pinout, 3.74" x 3.74")

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/ or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.



## Carrier Board

Carrier Board for COM Express® Type 6 modules  
in **3.5"** Form Factor

Most compact, I/O-rich COM Express® Type 6  
carrier board

### CCOMe-C30



Cross-compatible  
platform with x86  
and Arm solutions

Video Interfaces	1 x DP++ connector 2 x miniDP++ connectors LVDS 24-bit Single/Dual Channel LVDS External EDID flash socket eDP 4-lanes 40 poles VESA connector
Mass Storage	S-ATA 7p M connector + 4 pins power connector M.2 Socket 2 2260 Key B slot for SSD M.2 Socket 3 2280 Key M slot for PCI-e x4 SSDs µSD Card slot (interface multiplexed with GPIO header)
Networking	Dual RJ-45 connector (1 port managed by COM Express Gigabit Ethernet interface, 1 port managed by Carrier board's Intel® I21x GbEthernet controller) M.2 Socket 2 2242 / 3042 Key B slot for WWAN modules (modem) M.2 Socket 1 2230 Key E slot for WiFi / BT modules
USB	3 x USB 3.0 Host ports on Type-A sockets 2 x USB 2.0 Host ports on Type-A sockets 1 x USB 2.0 Host port on internal pin header
Audio	On-board HD Audio Codec (Realtek ALC262) Mic In + Line Out internal pin header
Serial Ports	2 x RS-232 / RS-422 / RS-485 ports on internal pin header (from carrier board's SuperI/O) 2 x RS-232 ports on feature pin header (from module)
Other Interfaces	microSIM slot for M.2 modem 4 x GPI + 4 x GPO pin header (interface multiplexed with µSD slot) Button / LEDs front panel header 3-pin tachometric FAN connector I2C + SM Bus on feature Pin header LPC internal header
Power Supply	19÷24 V <sub>DC</sub> (only CPU modules with max 45W TDP supported) Mega-Fit® 2x1 Power Connector Cabled Coin-cell connector for RTC
Operating Temperature*	0°C ÷ +50°C
Dimensions	146x102mm (3.5" form factor, 5.75" x 4.02")

\*All carrier board components must remain within the operating temperature at any and all times, including start-up; carrier operating temperature is independent of the module installed. Please refer to the specific module for more details. Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider specific cooling solutions for the final system.

## Development Kit

Cross Platform **Dev Kit** compatible with  
**x86 and Arm** COM Express® Type 6 modules

Platform independent kit for fast  
Time-to-market

### COM EXP T6 DEV KIT



Cross-compatible  
platform with x86  
and Arm solutions

SCHEMATICS  
PUBLICLY AVAILABLE

#### FEATURES OF CCOMe-C96

Video Interfaces	3 x DP++ connector VGA connector LVDS 24-bit Single/Dual Channel eDP 4-lanes 40 poles VESA connector LVDS External EDID flash socket
Mass Storage	4x S-ATA 7p M connectors µSD Card slot (interface multiplexed with GPIO header)
Networking	1x GbEthernet RJ-45 connector
USB	4x USB 3.1 Host ports on Type-A sockets 4 x USB 2.0 Host ports on Quad Type-A sockets
PCI-e	2x PCI-e x4 Slots 1x PCI-e x16 Slot
Audio	On-board HD Audio Codec (Realtek ALC888S) HD Audio Jacks S/PDIF Out Optical connector Mic In + Line Out internal pin header
Serial Ports	2 x RS-232 / RS-422 / RS-485 ports on internal pin header (from carrier board's LPC Dual UART controller) 2 x RS-232 ports on dedicated pin header (from module)
Other Interfaces	4 x GPI + 4 x GPO pin header (interface multiplexed with µSD slot) SPI Flash header Button / LEDs front panel header 4-pin tachometric FAN connector I2C + SM Bus on feature Pin header FuSa Header I2C Flash Socket JTAG connector LPC internal header USB overcurrent header SM Bus Smart Battery Connector 4 x 7-segment LCD displays for POST codes LPC/eSPI internal header
Power Supply	ATX 24 poles connector for carrier board working only Auxiliary 12V connector for carrier board working only 12 VDC power in connector for COM Express module's working Cabled Coin-cell connector for RTC
Operating Temperature*	0°C ÷ +60°C (Commercial version)
Dimensions	305x244mm (ATXform factor, 12" x 9.6")

\*All carrier board components must remain within the operating temperature at any and all times, including start-up; carrier operating temperature is independent of the module installed. Please refer to the specific module for more details. Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider specific cooling solutions for the final system.

Development kit for  
COM Express® Modules



# ETX<sup>®</sup> 3.0

Long Term Support

## ETX<sup>®</sup> STANDARD ADVANTAGES



## COMPUTER-ON-MODULE APPROACH

Design investment limited to the carrier board | Consolidated standard form factor | Scalable and future-proof  
Long-term availability | Arm and x86 cross-compatibility | Multi-vendor solution | Highly configurable  
Innovative and upgradable | Accelerated time-to-market



ETX

ETX<sup>®</sup> Module with the Intel<sup>®</sup> Atom<sup>®</sup> E3800 and Celeron<sup>®</sup> (formerly Bay Trail) System-on-Chip

Update your legacy design

ETX-A61



AI-ENABLED WITH CLEA

Processor	Intel <sup>®</sup> Atom <sup>™</sup> E3845, Quad Core @1.91GHz, 2MB Cache, 10W TDP Intel <sup>®</sup> Atom <sup>™</sup> E3827, Dual Core @1.75GHz, 1MB Cache, 8W TDP Intel <sup>®</sup> Atom <sup>™</sup> E3826, Dual Core @1.46GHz, 1MB Cache, 7W TDP Intel <sup>®</sup> Atom <sup>™</sup> E3825, Dual Core @1.33GHz, 1MB Cache, 6W TDP Intel <sup>®</sup> Atom <sup>™</sup> E3815, Single Core @1.46GHz, 512KB Cache, 5W TDP Intel <sup>®</sup> Celeron <sup>®</sup> J1900, Quad Core @2.0GHz, 2MB Cache, 10W TDP Intel <sup>®</sup> Celeron <sup>®</sup> N2930, Quad Core @1.83GHz, 2MB Cache, 7.5W TDP Intel <sup>®</sup> Celeron <sup>®</sup> N2807, Dual Core @1.58GHz, 1MB Cache, 4.3W TDP
Max Cores	4
Max Thread	4
Memory	DDR3L memory soldered on-board E3845, E3827, J1900, N2930: up to 8GB Dual-Channel DDR3L 1333MHz E3826: up to 8GB Dual-Channel DDR3L 1066MHz N2807: up to 4GB Single-Channel DDR3L 1333MHz E3825, E3815: up to 4GB Single-Channel DDR3L 1066MHz
Graphics	Integrated Intel <sup>®</sup> HD Graphics 4000 series controller Dual independent display support HW decoding of H.264, MPEG2, MVC, VC1, VP8, MJPEG formats HW encoding of H.264, MPEG2 and MVC formats
Video Interfaces	VGA standard analog video interface 18 / 24 bit single / dual channel LVDS interface (VESA and JEIDA color mapping compatible)
Video Resolution	CRT Interface: Up to 2560 x 1600 @ 60Hz LVDS interface: Up to 1920 x 1200 @ 60Hz
Mass Storage	Optional eMMC drive soldered on-board 2 x external SATA or 2 x PATA or 1 x PATA + 1 x SATA channels (factory options) µSD Card Slot
Networking	Gigabit Ethernet controller, makes available a 10 / 100Mbps Ethernet interface
USB	4 x USB 2.0 Host ports
Audio	HD Audio codec, Realtek ALC262
Serial Ports	2 x Serial ports (TX / RX / RTS / CTS signals, TTL interface)
Other Interfaces	PCI Bus rel. 2.3 compliant ISA Bus LPT interface shared with Floppy Drive interface PS / 2 mouse and keyboard interface I2C Bus SM Bus Watch Dog timer Power Management Signals
Power Supply	+5V <sub>DC</sub> ± 5% and + 5V <sub>SB</sub> (optional)
Operating System	Microsoft <sup>®</sup> Windows 7 (32 / 64 bit) Microsoft <sup>®</sup> Windows 8.1 (32 / 64 bit) Microsoft <sup>®</sup> Windows 10 (32 / 64 bit) Microsoft <sup>®</sup> Windows 10 IoT Microsoft <sup>®</sup> Windows Embedded Standard 7 (32 / 64 bit) Microsoft <sup>®</sup> Windows Embedded Standard 8 (32 / 64 bit) Microsoft <sup>®</sup> Windows Embedded Compact 7 Linux (32 / 64 bit) Yocto
Operating Temperature*	0°C ÷ +60°C (Commercial version)
Dimensions	114 x 95 mm (4.49" x 3.74")

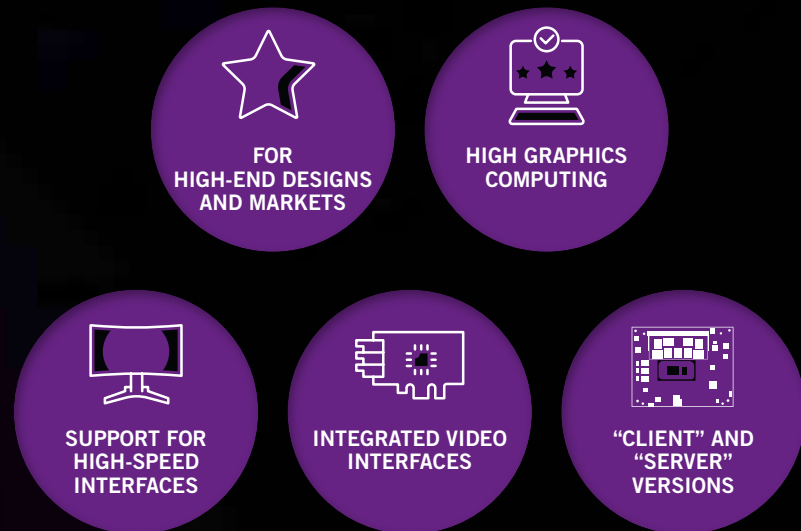
\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/ or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.





# COM-HPC®

## COM-HPC® STANDARD ADVANTAGES



## COMPUTER-ON-MODULE APPROACH

Design investment limited to the carrier board | Consolidated standards | Scalable and future-proof solutions  
Long-term availability | Arm and x86 compatibility | Multi-vendor solutions | Highly configurable  
Innovative and updatable solutions | Reduced time-to-market

## COM-HPC® SUPPORTED FEATURES

COM-HPC® Client	COM-HPC® Server
49x PCIe	65x PCIe
2x MIPI-CSI	
2x 25GbE KR	
3x DDI	8x 25GbE KR
2x BaseT (up to 10 Gb)	
2x SoundWire, I <sup>2</sup> S	BaseT (up to 10 Gb)

COM-HPC® Client	COM-HPC® Server
4x USB4	2x USB4
	2x USB3.2
4x USB2.0	4x USB2.0
2x SATA	2x SATA
eSPI, 2x SPI, SMB	eSPI, 2x SPI, SMB
2x I <sup>2</sup> C, 2x UART	2x I <sup>2</sup> C, 2x UART
12x GPIO	12x GPIO

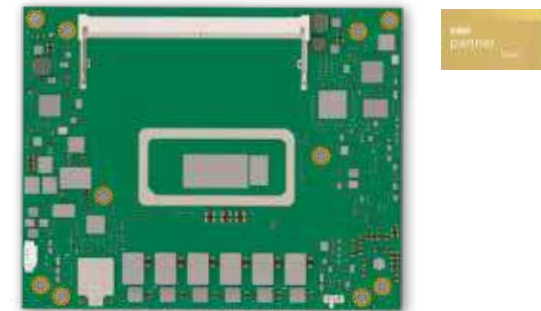


COM-HPC® Client Size A

COM-HPC® with 12<sup>th</sup> Gen Intel® Core™  
(formerly Alder Lake - H series)

Immersive graphics, enhanced AI-performance  
and efficiency in a standard form factor

ORION



Available in Industrial  
Temperature Range

Processor	12 <sup>th</sup> Gen Intel® Core™ processors, up to 14 cores & up to 20 threads, up to 24MB cache, 45W TDP (35W cTDP)
System Memory	2x DDR5-4800 SODIMM Slots, up to 64GB
Graphics	Integrated Iris® Xe Architecture, up to 96 Execution Units Up to two video decode boxes (VDBoxes) for enhanced video stream capabilities Support for up to 48 simultaneous 1080p streams ingestion Support for up to four independent displays at up to 4K60 HDR resolution or one display at 8K resolution
Video Interfaces	3x DDI ports supporting DP 1.4, HDMI 2.0b (HDMI 2.1 via LSPCON) 1x eDP 1.4b interface 4x DP interface on USB Type-C connector (Alternate mode)
Video Resolution	DP: Up to 5120x3200 @60Hz 24bpp / 7680x4320@60Hz 30bpp with DSC eDP: Up to 5120x3200 @60Hz 24bpp / 5120x3200@120Hz 30bpp with DSC HDMI 1.4: Up to 4Kx2K 24-30Hz 24bpp HDMI 2.1: Up to 4Kx2K 48-60Hz 24bpp / 4Kx2K 48-60Hz 12bpc (need dedicated redriver on carrier board)
Mass Storage	2x external SATA Gen3 Channels PCI-e x4 ports can be used to connect, on the carrier board, M.2 NVMe drives
Networking	2x NBase-T Ethernet interfaces, supporting 2.5Gb Ethernet connection, managed by as many Intel® i225 2.5GbE Controllers Optional on-board M.2 1216 module, supporting WiFi 802.11ax (WiFi 6E) MIMO 2x2 + MU-MIMO and Bluetooth 5.2, external antennas*
USB	*Certification upon request Up to 4 x USB4 Gen 2x2 Host ports 4 x USB 2.0 Host port
PCI-e	Up to 8x PCIe x1 Gen3 lanes 1x PCIe x8 Gen4 port 2x PCIe x4 Gen4 ports
Audio	SoundWire and I2S Audio Interface
Serial Ports	2 x UARTs
Other Interfaces	2x 4-lane CSI-2 interfaces SPI, SM Bus, 2x I2C, Watchdog timer, Carrier board FAN Control Management signals, ACPI signals, Safety Status signals Deep Sleep / Battery support Optional TPM 2.0 module on-board 12x GPIOs
Other	AI engine: Intel® Gaussian & Neural Accelerator 3.0 (Intel® GNA) Can operate while the SOC is in lower power states
Power Supply	+8V <sub>dc</sub> ... +20V <sub>dc</sub> Main power supply +5V <sub>dc</sub> stand-by
Operating System	Windows 10 IoT Enterprise LTSC Windows Server 2022 Wind River VxWorks 7.0 Linux Kernel LTS Wind River Linux Yocto Android
Operating Temperature*	0°C ÷ +60°C (Commercial version) -40°C ÷ +85°C (Industrial Range)
Dimensions	120 x 95 mm (COM-HPC® Size A Form factor, Client pinout)

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.

COM-HPC® Client Size A

COM-HPC® with 11<sup>th</sup> Gen Intel® Xeon®  
W-11000E Series, Core™ vPro® and Celeron®  
(formerly Tiger Lake-H)

Processing power, high performance graphics  
and top class connectivity

LAGOON



Available in Industrial  
Temperature Range

Processor	11 <sup>th</sup> Generation Intel® Xeon®, Core™ and Celeron® Processors, also available in industrial temperature range. • Intel® Core™ vPRO® <b>i7-11850HE</b> , Eight Core @ 2.6GHz (up to 4.7GHz in Turbo Boost) with HT, 24MB Cache L3, 45/35W cTDP • Intel® Core™ vPRO® <b>i5-11500HE</b> , Six Core @ 2.6GHz (up to 4.5GHz in Turbo Boost) with HT, 12MB L3 Cache, 45/35W cTDP • Intel® Core™ <b>i3-11100HE</b> , Quad Core @ 2.4GHz (up to 4.4GHz in Turbo Boost) with HT, 8MB L3 Cache, 45/35W cTDP • Intel® Celeron® <b>6600HE</b> , Dual Core @2.6GHz, 8MB L3 Cache, 35W TDP • Intel® Xeon® vPRO® <b>W-11865MRE</b> , Eight Core @ 2.6GHz (up to 4.7GHz in Turbo Boost) with HT, 24MB L3 Cache, with ECC and TCC/TSN, 45/35W cTDP – Industrial (w/ Turbo OFF) • Intel® Xeon® vPRO® <b>W-11555MRE</b> , Six Core @ 2.6GHz (up to 4.5GHz in Turbo Boost) with HT, 12MB L3 Cache, with ECC and TCC/TSN, 45/35W cTDP – Industrial (w/ Turbo OFF) • Intel® Xeon® <b>W-11155MRE</b> , Quad Core @ 2.4GHz (up to 4.4GHz in Turbo Boost) with HT, 8MB L3 Cache, with ECC and TCC/TSN, 45/35W cTDP – Industrial (w/ Turbo OFF) • Intel® Xeon® vPRO® <b>W-11865MLE</b> , Eight Core @ 1.5GHz (up to 4.5GHz in Turbo Boost) with HT, 24MB L3 Cache, with ECC and TCC/TSN, 25W TDP • Intel® Xeon® vPRO® <b>W-11555MLE</b> , Six Core @ 1.9GHz (up to 4.4GHz in Turbo Boost) with HT, 24MB L3 Cache, with ECC and TCC/TSN, 25W TDP • Intel® Xeon® <b>W-11155MLE</b> , Quad Core @ 1.8GHz (up to 3.1GHz in Turbo Boost) with HT, 24MB L3 Cache, with ECC and TCC/TSN, 25W TDP B Cache, 28/15/12W cTDP - Industrial (w/ Turbo OFF)
Max Cores	8
Chipset	Intel® RM590E, HM570E or QM580E PCH
Memory	2x DDR4-3200 SODIMM Slots with ECC (In-Band Error Correction Code), up to 64GB supported
Graphics	Integrated Iris Xe Graphics Core Gen12 architecture, with up to 32 Execution Units and up to 2 VDBox I MPEG2, WMV9, AVC/H.264, JPEG/ MJPEG, HEVC/H.265, VP9, AV1 HW decoding, up to 8K60, I AVC/H.264, HEVC/H.265, JPEG, VP9 HW encoding, up to 8K30 I Support up to 4 independent displays.
Video Interfaces	1x eDP 1.4b or MIPI-DSI 1.3 Up to 3x DP++ interface, supporting Display Port 1.4a and HDMI 2.0b Up to 2x Display Port over Type-C (Alternate mode) DP, eDP: Up to 5120x3200 @60Hz 24bpp / 7680x4320@60Hz 30bpp with DSC
Video Resolution	MIPI-DSI: Up to 3200x2000 @60Hz 24bpp, 5120x3200 @60Hz 24bpp with DSC HDMI 1.4: Up to 4Kx2K 24-30Hz 24bpp HDMI 2.0b: Up to 4Kx2K 48-60Hz 24bpp / 4Kx2K 48-60Hz 12bpc (need dedicated redriver on carrier board)
Mass Storage	2 x S-ATA Gen3 Channels I PCI-e x4 port can be used to connect, on the carrier board, M.2 NVMe drives
Networking	Up to 2x NBase-T Ethernet interfaces, supporting 2.5Gb Ethernet connection, managed by as many Intel® i225 2.5GbE Controllers with TSN
USB	2x USB4 ports I 2x USB 3.2 Gen 2x2 ports I 8 x USB 2.0 Host ports
PCI-e	1x PCI-e x4 Gen 4 port for NVMe I 16x PCI-e Gen4 lanes, can be used to support 1x PCI-e x16, 2x PCI-e x8 or (1x PCI-e x8 +2x PCI-e x4) root ports 20x PCI-e Gen 3 lanes, groupable to support up to 12 root ports, max allowed grouping PCI-e x4
Audio	SoundWire and I2S Audio Interface
Serial Ports	2x legacy UARTs, managed by the Embedded Controller
Other Interfaces	2x 4-lane CSI-2 interfaces, optional I SPI, eSPI, SM Bus, 2x I2C, Watchdog timer, Carrier board FAN Control I Management signals, ACPI signals, Safety Status signals I Deep Sleep / Battery support I Optional TPM 2.0 module on-board I 12x GPIOs
Power Supply	+8V <sub>dc</sub> ... +20V <sub>dc</sub> Main power supply +5V <sub>dc</sub> stand-by
Operating System	Windows 10 IoT Enterprise LTSC I Linux Kernel LTS I Yocto Project 3.0 I WindRiver VxWorks 7.0 I Android
Operating Temperature*	0°C ÷ +60°C (Commercial version) -40°C ÷ +85°C (Industrial Range)
Dimensions	120 x 95 mm (COM-HPC® Size A Form factor, Client pinout)

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.



COM-HPC® with 11th Gen Intel® Core™ and Celeron® (formerly Tiger Lake-UP3)

Cross Platform Dev Kit compatible with x86 and Arm COM-HPC® Client modules

11<sup>th</sup> Generation Intel® Core™ and Celeron® Processors in brand-new COM-HPC® format

CARINA



Available in Industrial Temperature Range

Processor	11 <sup>th</sup> Generation Intel® Core™ and Celeron® Processors, also available in industrial temperature range <ul style="list-style-type: none"><li>Intel® Core™ <b>I7-1185G7E</b>, Quad Core @ 2.8GHz (4.4GHz in Turbo Boost) with HT, 12MB Cache, 28/15/12W cTDP</li><li>Intel® Core™ <b>I5-1145G7E</b>, Quad Core @ 2.6GHz (4.1GHz in Turbo Boost) with HT, 8MB Cache, 28/15/12W cTDP</li><li>Intel® Core™ <b>I3-1115G4E</b>, Dual Core @ 3.0GHz (3.9GHz in Turbo Boost) with HT, 6MB Cache, 28/15/12W cTDP</li><li>Intel® Celeron® <b>6305E</b>, Dual Core @ 1.8GHz, 4MB Cache, 15W TDP</li><li>Intel® Core™ <b>I7-1185G6RE</b>, Quad Core @ 2.8GHz (4.4GHz in Turbo Boost) with HT, 12MB Cache, with IBECC, 28/15/12W cTDP – Industrial (w/ Turbo OFF)</li><li>Intel® Core™ <b>I5-1145G6RE</b>, Quad Core @ 2.6GHz (4.1GHz in Turbo Boost) with HT, 8MB Cache, with IBECC, 28/15/12W cTDP - Industrial (w/ Turbo OFF)</li><li>Intel® Core™ <b>I3-1115G6RE</b>, Dual Core @ 3.0GHz (3.9GHz in Turbo Boost) with HT, 6MB Cache, 28/15/12W cTDP - Industrial (w/ Turbo OFF)</li></ul>
Max Cores	4
Memory	2x DDR4-3200 SODIMM Slots with IBECC (In-Band Error Correction Code), up to 64GB supported
Graphics	Integrated Iris X® Graphics Core Gen12 architecture, with up to 96 Execution Units MPEG2, WMV9, AVC/H.264, JPEG/MJPEG, HEVC/H.265, VP9, AV1 HW decoding, up to 8k @60. AVC/H.264, HEVC/H.265, JPEG, VP9 HW encoding Support up to 4 independent displays.
Video Interfaces	1x eDP 1.4b or MIPI_DSI 1.3 Up to 3x DP++ interface, supporting Display Port 1.4a and HDMI 2.0b Up to 4x Display Port over Type-C (Alternate mode)
Video Resolution	DP, eDP: Up to 5120x3200 @60Hz 24bpp / 7680x4320@60Hz 30bpp with DSC MIPI-DSI: Up to 3200x2000 @60Hz 24 bpp, 5120x3200 @60Hz 24bpp with DSC HDMI 1.4: Up to 4Kx2K 24-30Hz 24bpp HDMI 2.0b: Up to 4Kx2K 48-60Hz 24bpp / 4Kx2K 48-60Hz 12bpc (need dedicated redriver on carrier board)
Mass Storage	2 x S-ATA Gen3 Channels PCI-e x4 port can be used to connect, on the carrier board, M.2 NVMe drives
Networking	Up to 2x NBase-T Ethernet interfaces, supporting 2.5Gb Ethernet connection, managed by as many Intel® i225 2.5GbE Controllers M.2 1216 SD Module supporting WiFi 802.11abgn+ac R2 MIMO 2x2 + MU-MIMO and Bluetooth 5.0
USB	Up to 4 x USB 4.0 / USB 3.2 Host ports 4 x USB 2.0 Host port
PCI-e	1x PCI-e x4 Gen 4 port Up to 8x PCI-e Gen 3 lanes, groupable to support up to 4 root ports (5 root ports without the second 2.5GbE controller)
Audio	SoundWire and I2S Audio Interface
Serial Ports	2 x UARTs
Other Interfaces	2x 4-lane CSI-2 interfaces, optional SPI, SM Bus, 2x I2C, Watchdog timer, Carrier board FAN Control Management signals, ACPI signals, Safety Status signals Deep Sleep / Battery support Optional TPM 2.0 module on-board 12x GPIOs
Power Supply	+8V <sub>DC</sub> - +20V <sub>DC</sub> Main power supply +5V stand-by
Operating System	Windows 10 IoT Enterprise LTSC Linux Kernel LTS Yocto VxWorks 7.0 Android
Operating Temperature*	0°C ÷ +60°C (Commercial version) -40°C ÷ +85°C (Industrial version)
Dimensions	120 x 95 mm (COM-HPC® Size A Form factor, Client pinout)

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.

Development Kit for COM-HPC Client Modules

COM-HPC CLIENT DEV KIT



Cross-compatible platform with x86 and Arm solutions

SCHEMATICS PUBLICLY AVAILABLE



FEATURES OF CCHPC-C78-C

Video Interfaces	1x 40-poles eDP/DSI connector 3x DP++ connectors 2x CSI Camera Input Connectors
Mass Storage	2x S-ATA 7p M connectors 2x M.2 Socket 3 Key M slots for M.2 NVMe Drives
Networking	2x NBase-T Ethernet RJ-45 connectors 2x 10Gbase-KR interfaces on OCP Type-C connector
USB	4x USB 4.0 / USB 3.2 Gen2x2 ports on Standard Type-C sockets with PD functionality 4x USB 2.0 Host ports on standard Quad Type-A Socket USB Overcurrent pin header
PCI-e	2x PCI-e x4 Slots 2x PCI-e x4 interfaces on M.2 Socket 3 Key M Slots 2x PCI-e x16 Slot
Audio	I2S Audio Codec Line In, Line Out, Mic in Triple Audio jack Mic In + Line Out internal pin header I2S/Soundwire shared interface + Soundwire only interface on internal pin header
Serial Ports	2 x RS-232/RS-422/RS-485 ports on dedicated pin header (from module) 2 x RS-232/RS-422/RS-485 ports on dedicated pin header (from eSPI Dual UART controller)
Other Interfaces	BMC connector with SM Bus, I2C, eSPI, 1x USB 2.0, 1x PCI-e x1, 1 x UART, 2x GPIO 12 GPIO pin header Boot SPI Internal Header Button / LEDs front panel header 4-pin tachometric FAN connector Feature Pin header with 2xI2C, SM Bus, GP SPI, Management signals I2C Flash Socket SM Bus Smart Battery Connector 2x 7-segment LCD displays for POST codes eSPI internal header Functional Safety (FuSa) internal pin header
Power Supply	ATX 24 poles connector for carrier board working only Auxiliary 12V PCI-e 6-pin power connector Dedicated EPS CPU Power in connector (voltage range 8..20V) for COM HPC Client module's working Cabled Coin-cell connector for RTC
Operating Temperature*	-40°C ÷ +85°C (Industrial Temperature range)
Dimensions	305x244mm (ATX form factor, 12" x 9.6")

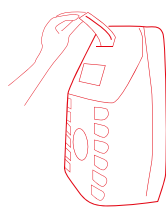
\*All carrier board components must remain within the operating temperature at any and all times, including start-up; carrier operating temperature is independent of the module installed. Please refer to the specific module for more details. Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider specific cooling solutions for the final system.

Development kit for COM-HPC® Modules



# BECOME INSPIRED BY SECO EXPERTISE IN DIVERSE APPLICATIONS

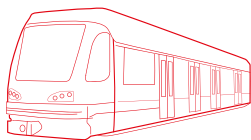
## TRANSPORTATION



### Onboard Ticket Point-of-Sale

**CUSTOMER**

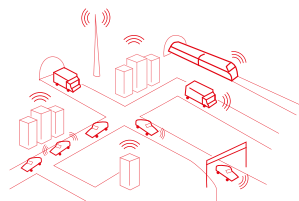
Provider of turn-key solutions for public transportation



### Passenger Information & Advertising Systems

**CUSTOMER**

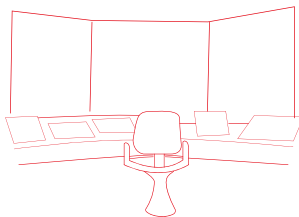
Manufacturer of high-resolution dynamic real-time on-board infotainment systems



### Intelligent Traffic System

**CUSTOMER**

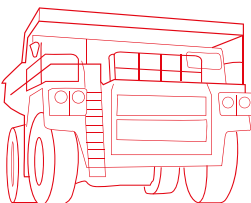
Global supplier of intelligent transportation systems



### IP Voice System for Air Traffic Controllers

**CUSTOMER**

Company specialized in design, development and manufacturing of telecommunications solutions

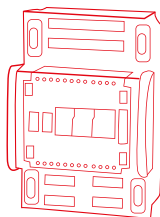


### Mining Dump Truck

**CUSTOMER**

Producer of special vehicles for open-pit and underground mining

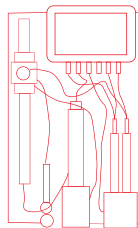
## INDUSTRIAL AUTOMATION



### Servo Controller

**CUSTOMER**

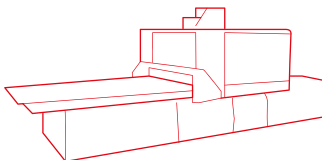
Manufacturer of industrial automation solutions



### Monitoring Station

**CUSTOMER**

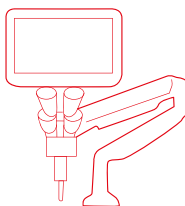
Global manufacturer of solutions for water quality measurement



### CNC Machining Center for Lumber

**CUSTOMER**

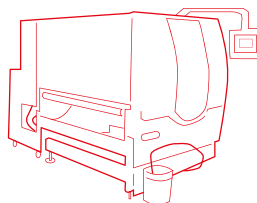
Manufacturer of automated machines for wood, stone, and plastic processing



### HMI for Precision Welder

**CUSTOMER**

Manufacturer of precision welding products



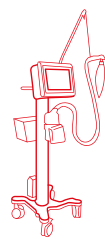
### CNC Machining Center

**CUSTOMER**

Manufacturer of production machines

# BECOME INSPIRED BY SECO EXPERTISE IN DIVERSE APPLICATIONS

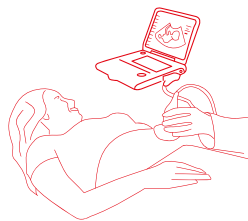
## MEDICAL



### ICU Lung Ventilator

**CUSTOMER**

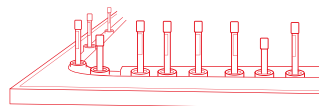
Leading manufacturer of medical devices



### Ultrasound

**CUSTOMER**

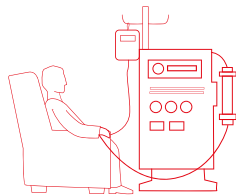
Leading manufacturer of diagnostic imaging solutions



### Industrial Multipurpose System

**CUSTOMER**

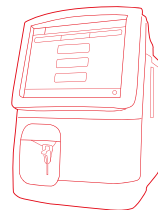
Leading manufacturer of diagnostic solutions for clinical laboratories



### Dialysis Machine

**CUSTOMER**

Leader in medical solutions, services and technologies

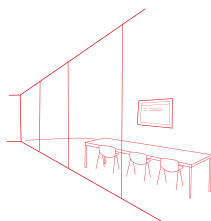


### Real-Time Blood Gas Testing System

**CUSTOMER**

Global medical diagnostic equipment company

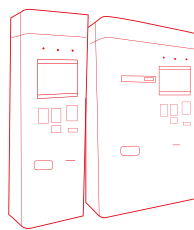
## DIGITAL SIGNAGE / INFOTAINMENT



### Room Guide for Meeting Room Management

**CUSTOMER**

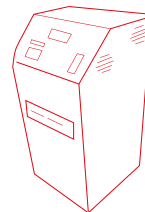
Manufacturer of communication platforms



### Payment Kiosk for Parking

**CUSTOMER**

Supplier of solutions for parking environments



### Automated Bank Machine

**CUSTOMER**

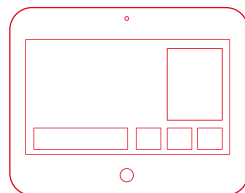
Company specialized in the delivery of security-related services



### Bowling Scoring Management System

**CUSTOMER**

Innovative bowling equipment provider



### Condominium Digital Notice Board

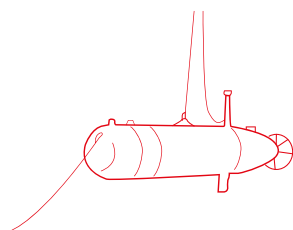
**CUSTOMER**

Provider of services and advertisement for buildings



# BECOME INSPIRED BY SECO EXPERTISE IN DIVERSE APPLICATIONS

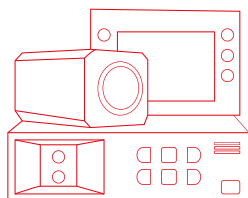
## SECURITY/SURVEILLANCE



### AUV – Autonomous Underwater Vehicle

**CUSTOMER**

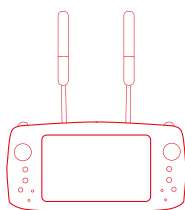
Company specialized in scientific research and technology development



### Car Security Gateway

**CUSTOMER**

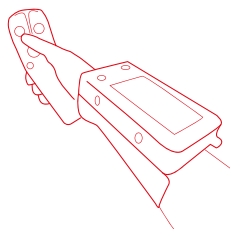
Leading company in the field of law enforcement technology



### Tablet-Based Unmanned Vehicle Controller

**CUSTOMER**

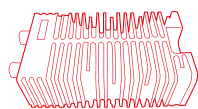
Unmanned vehicle manufacturer



### Multicomponent UAV Remote Control System

**CUSTOMER**

Tier one defense contractor

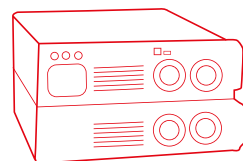


### Drone-Mounted Rugged Secure Radio

**CUSTOMER**

Tier one defense contractor

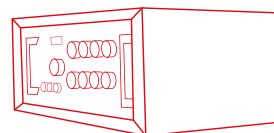
## UTILITIES



### Broadcast Equipment

**CUSTOMER**

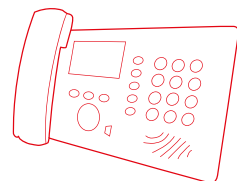
Manufacturer of transmitter systems



### Controller System for Telco

**CUSTOMER**

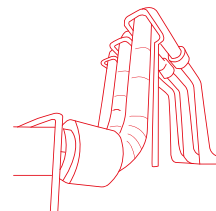
Supplier of telecommunications solutions



### IP Telephone Switchboard

**CUSTOMER**

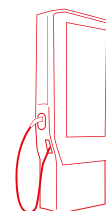
Manufacturer of terminals for communications over internet



### Edge Computing for Gas Pipeline

**CUSTOMER**

Gas transport service provider



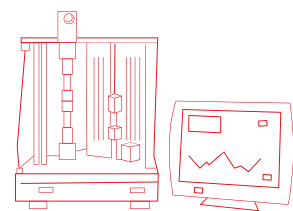
### EV Charging Station

**CUSTOMER**

E-mobility solutions provider

# BECOME INSPIRED BY SECO EXPERTISE IN DIVERSE APPLICATIONS

## DEVICES



### Measuring Device

**CUSTOMER**

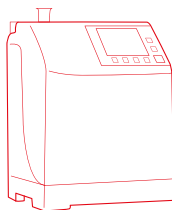
Company specialized in products and solutions for measuring and metering



### Smart Dog Collar

**CUSTOMER**

Jagger & Lewis: company focused on improving households through connected devices



### Vacuum Leak Detector

**CUSTOMER**

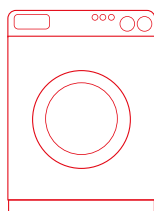
Manufacturer of high-end industrial equipment



### Autonomous House Cleaning Robot

**CUSTOMER**

Multinational equipment manufacturer, innovation division



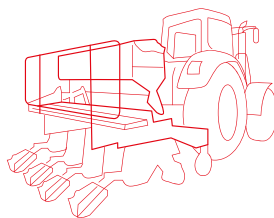
### Connected Washing Machine and Industrial Oven

**CUSTOMER**

Multinational manufacturer of home appliances

## MORE FIELDS OF APPLICATION

### AGRICULTURE

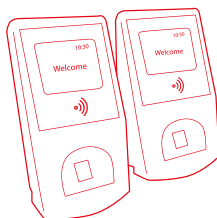


### Agriculture Tractor Equipment

**CUSTOMER**

Manufacturer of equipment for farming

### BUILDING AUTOMATION

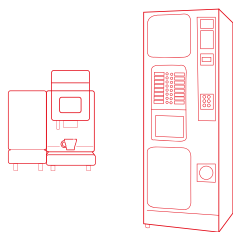


### 7" HMI with Camera for Access Control and People Counting

**CUSTOMER**

Manufacturer of access control technology

### VENDING & COFFEE



### Tabletop Coffee Machines & Free-Standing Vending Machines

**CUSTOMER**

Coffee and vending machine manufacturer

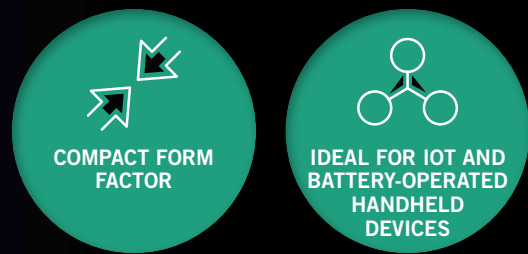




# myon

MicroModule SOM

## MYON STANDARD ADVANTAGES



Compact form factor | Very low power consumption | Long availability for at least 10 years  
Pin compatibility guaranteed for successor products | ARM-based processors from Qualcomm® and NXP  
2x 100 pin Hirose DF40 connectors | High pin compatibility with each other  
Available with Linux, Android and Microsoft Windows 10 IoT Core & Enterprise



Micro CPU module with **Snapdragon™ 410E**

Thanks to the compact form factor ideal for IoT and battery-powered handheld devices

Myon I by Keith & Koep



Available in Industrial Temperature Range

Processor	Qualcomm® Snapdragon™ 410E QuadCore ARM Cortex A53, up to 1.2GHz (APQ8016E), ARM Cortex M3
Memory	1 GByte LPDDR3 -1066 (533MHz), 32Bit, 2 Gbyte on request (part of EMCP)
Graphics	Qualcomm® Adreno™ 306 400MHz GPU OpenGL ES 3.0, OpenCL, DirectX
Video Interfaces	LVDS or MIPI Display (4 channel)
Video Resolution	LVDS, MIPI: 1080p @30
Mass Storage	8 Gbyte eMMC, 16 Gbyte on request (part of EMCP)
Networking	Onboard WLAN 802.11 b/g/n 2.4 GHz, Bluetooth 4.1 (On-board antennas or UFL connectors) Ethernet via USB possible
USB	USB 2.0 OTG
Audio	Audio Codec: Stereo Headphone output, Mono Speaker 8Ω, 3 Microphone inputs
Other Interfaces	SD/SDIO Card, MIPI Camera (2ch and 4Ch) 8 Ports configurable for different interfaces: GPIO, UART, SPI, I2C, I2S
Power Supply	LiPo 3 - 4.5V / typ. 3.3V / charger 5V
Operating System	Windows 10 IoT Core Linux Android
Operating Temperature*	-25 ÷ 85°C
Dimensions	48 x 32 x 4.2 mm without antennas 58 x 32 x 4.2 mm with antennas

\*All carrier board components must remain within the operating temperature at any and all times, including start-up; carrier operating temperature is independent of the module installed. Please refer to the specific module for more details. Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider specific cooling solutions for the final system.

Myon MicroModule SOM

Micro CPU module with **NXP i.MX 8M Mini & i.MX8M Nano**

Ideal for IoT and battery-powered handheld devices thanks to particularly compact form factor

Myon II by Keith & Koep



Available in Industrial Temperature Range

Processor	NXP i.MX 8M Mini Family based on ARM® Cortex®-A53 cores + general purpose Cortex®-M4 400MHz processor: <ul style="list-style-type: none"><li>i.MX 8M Mini Quad - Full featured, 4x Cortex®-A53 cores up to 1.8GHz</li><li>i.MX 8M Mini Dual - Full featured, 2x Cortex®-A53 cores up to 1.8GHz</li><li>i.MX 8M Mini Solo - Full featured, 1x Cortex®-A53 cores up to 1.8GHz</li><li>i.MX 8M Mini Quad Lite - 4x Cortex®-A53 cores up to 1.8GHz, no VPU</li><li>i.MX 8M Mini Dual Lite - 2x Cortex®-A53 cores up to 1.8GHz, no VPU</li><li>i.MX 8M Mini Solo Lite - 1x Cortex®-A53 cores up to 1.8GHz, no VPU</li></ul>
Memory	NXP i.MX 8M Nano Family based on ARM® Cortex®-A53 cores + general purpose Cortex®-M7 750MHz processor: <ul style="list-style-type: none"><li>i.MX 8M Nano Quad - Full featured, 4x Cortex®-A53 cores up to 1.5GHz</li><li>i.MX 8M Nano Dual - Full featured, 2x Cortex®-A53 cores up to 1.5GHz</li><li>i.MX 8M Nano Solo - Full featured, 1x Cortex®-A53 cores up to 1.5GHz</li><li>i.MX 8M Nano Quad Lite - 4x Cortex®-A53 cores up to 1.5GHz, no VPU</li><li>i.MX 8M Nano Dual Lite - 2x Cortex®-A53 cores up to 1.5GHz, no VPU</li><li>i.MX 8M Nano Solo Lite - 1x Cortex®-A53 cores up to 1.5GHz, no VPU</li></ul>
Graphics	Myon II: Soldered down LPDDR4-3200 memory, 32-bit interface, up to 8GB Myon II Nano: Soldered down LPDDR4-3200 memory up to 4 GB, 16-bit interface
Video Interfaces	i.MX 8M Mini Family of processors: Vivante GC320 2D accelerator + GCNanoUltra 3D accelerator OpenGL ES 2.0, OpenVG 1.1 support i.MX 8M Nano Family of processors: Vivante GC7000UL 2D/3D GPU OpenGL ES 3.1, OpenCL1.2, Vulkan support
Video Resolution	MIPI display (4 channel) / Single- or Dual-LVDS
Mass Storage	LVDS, MIPI: Up to 1920 x 1080p @60
Networking	onboard 8 Bit wide eMMC 2x SDIO interface (e.g. for external SD cards) 1x GB Ethernet RGMII and SIOP interface (for Myon II) External chipsets for wireless communication can be connected via SDIO, PCIe or USB interfaces (for Myon II)
USB	2x USB 2.0 OTG
PCI-e	PCIe (for Myon II)
Audio	Audio Codec: Stereo Headphone output, Speaker output, Stereo Line-In, Microphone inputs
Serial Ports	4x UART
Other Interfaces	SPDIF In/Out I2S Multichannel Serial-Audio-Interface 2x I2C SPI QSPI GPIOs PWM MIPI CSI (4 channel)
Power Supply	3.3 ÷ 5.0 VDC
Operating System	Linux Yocto Debian Android Windows 10 IoT
Operating Temperature*	-40 ÷ 85°C (industrial) -25 ÷ 85°C (Extended Consumer) 0 ÷ 70°C (Consumer)
Dimensions	48.0 x 32.0 x 4.2 mm

\*All carrier board components must remain within the operating temperature at any and all times, including start-up; carrier operating temperature is independent of the module installed. Please refer to the specific module for more details. Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider specific cooling solutions for the final system.



Carrier Board for Myon I,  
Myon II and Myon II Nano SOMs

Con**XM** by Keith & Koep



	Defined by compatible Myon SOMs <ul style="list-style-type: none"><li>Qualcomm® SnapdragonTM 410E Cortex A53, QuadCore up to 1.2GHz on Myon I SOM</li><li>NXP i.MX 8M Mini ARM Cortex A53 up to 1.8 GHz, up to Quad Core, integrated ARM Cortex M4 on Myon II SOM</li><li>NXP i.MX 8M Nano ARM Cortex A53 up to 1.5 GHz, up to Quad Core, integrated ARM Cortex M7 on Myon II Nano SOM</li></ul>
	LVDS, HDMI
	µSD Card Socket
	10/100 Mbit Ethernet RJ45 Connector WLAN 802.11 b/g/n 2.4GHz, Bluetooth via Myon I
	USB2.0 Host, USB2.0 OTG
	Footprint for one optional 16-pin analog expansion connector for stereo headset/line-out, speaker and analog line-in
	UART (low speed expansion connector)
	1x 40-pin low speed expansion connector (compatible to DragonBoard 410c): SPI, I2S, 2x I2C, 12x GPIO, DC power 1x 60-pin high speed expansion connector (compatible to DragonBoard 410c): 4L MIPI-DSI, USB, 2x I2C, 2L+4L MIPI-CSI
	Industrial +12 up to +24V supply, +5V (USB) / Lithium-ion, lithium-ion-polymer battery-charger / Coin-Cell charger (Myon I PMIC)
	Microsoft Windows 10 IoT Core Linux Android
	-20 ÷ 85°C
	100.0 mm x 90.0 mm x 18.0 mm

\*All carrier board components must remain within the operating temperature at any and all times, including start-up; carrier operating temperature is independent of the module installed. Please refer to the specific module for more details. Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider specific cooling solutions for the final system.

HMI with Myon MicroModule SOM technology  
supporting Myon I, Myon II and Myon II Nano

i-PAN **M7** by Keith & Koep



	Depends on compatible Myon SOMs <ul style="list-style-type: none"><li>Qualcomm® SnapdragonTM 410E Cortex A53, QuadCore up to 1.2GHz on Myon I SOM</li><li>NXP i.MX 8M Mini ARM Cortex A53 up to 1.8 GHz, up to Quad Core, integrated ARM Cortex M4 on Myon II SOM</li><li>NXP i.MX 8M Nano ARM Cortex A53 up to 1.5 GHz, up to Quad Core, integrated ARM Cortex M7 on Myon II Nano SOM</li></ul>
	Depends on compatible Myon MicroModule SOMs
	MIPI-CSI Camera connector
	7.0 inch LVDS Display, resolution 800 x 480, LED lifetime min. 30k hours, typ. 430 cd/qm brightness, P-Cap (Projected Capacitive touch screen)
	µSD Card Socket
	10/100 Mbit Ethernet RJ45 Connector WLAN 802.11 b/g/n 2.4GHz, Bluetooth via Myon I
	USB 2.0 Host, µUSB 2.0 OTG / USB via i-MOD extension connector
	Solderpads for Speaker, Headphone, Microphone
	UART via i-MOD extension connector
	I2C, CAN, Keys via i-MOD extension connectors Realtime Clock with Backup Cap LED Powerfail Detection
	Industrial +12 up to 24V supply / Power over Ethernet (POE) on request
	Microsoft Windows 10 IoT Linux Android
	-20 ÷ 70°C
	176.0 x 108.5 x 28 mm (include housing)

\*All carrier board components must remain within the operating temperature at any and all times, including start-up; carrier operating temperature is independent of the module installed. Please refer to the specific module for more details. Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider specific cooling solutions for the final system.





# TRIZEPS

## SODIMM SOM

### TRIZEPS STANDARD ADVANTAGES



Reduced development time with cost-effective production | High computing power with relatively small dimensions  
Long availability for at least 10 years | Pin compatibility for successor products | ARM-based processors from NXP  
SODIMM 200 connectors | High pin compatibility with each other  
Available with Linux, Android and Microsoft Windows 10 IoT Core & Enterprise



Trizeps SODIMM SOM

SODIMM-200 CPU-Module with  
NXP i.MX 8M Mini

14nm LPC FinFET for high-level video, voice and audio processing with low power consumption

Trizeps VIII Mini by Keith & Koep



Available in Industrial Temperature Range

Processor	NXP i.MX 8M Mini Family based on ARM® Cortex®-A53 cores + general purpose Cortex®-M4 400MHz processor: <ul style="list-style-type: none"><li>i.MX 8M Mini Quad - Full featured, 4x Cortex®-A53 cores up to 1.8GHz</li><li>i.MX 8M Mini Dual - Full featured, 2x Cortex®-A53 cores up to 1.8GHz</li><li>i.MX 8M Mini Solo - Full featured, 1x Cortex®-A53 cores up to 1.8GHz</li><li>i.MX 8M Mini Quad Lite - 4x Cortex®-A53 cores up to 1.8GHz, no VPU</li><li>i.MX 8M Mini Dual Lite - 2x Cortex®-A53 cores up to 1.8GHz, no VPU</li><li>i.MX 8M Mini Solo Lite - 1x Cortex®-A53 cores up to 1.8GHz, no VPU</li></ul>
Memory	Optional: Programmable FPGA with up to 4300 LUTs to convert parallel display/camera/data-streams to MIPI DSI/CSI Soldered down LPDDR4-3200 memory up to 8GB, 32-bit interface
Graphics	i.MX 8M Mini Family of processors: Vivante GC320 2D accelerator + GCNanoUltra 3D accelerator OpenGL ES 2.0, OpenVG 1.1 support
Video Interfaces	MIPI display (4 channel) / Single- or Dual-LVDS, LCD 24 Bit RGB
Video Resolution	LVDS, MIPI: Up to 1920 x 1080p @60
Mass Storage	Onboard 4 Bit wide µSD Card Socket or onboard 8 Bit wide eMMC
Networking	1x GB Ethernet RGMII PHY and SIOP interface Optional: WiFi 802.11 a/b/g/n/ac 2x2 MU-MIMO / Bluetooth 4.2/5.0
USB	2x USB 2.0 OTG
PCI-e	PCIe
Audio	Audio Codec: Stereo Headphone output, Mono Speaker output, Stereo Line-In, Microphone input
Serial Ports	4x UART
Other Interfaces	4 Bit wide SDIO SPDIF In/Out I2S Multichannel Serial-Audio-Interface 2x I2C SPI QSPI GPIOs PWM MIPI CSI (4 channel)
Power Supply	3.3 VDC
Operating System	Linux Yocto Linux Debian Android Windows 10 IoT
Operating Temperature*	-40 bis 85°C (Industrial) -25 bis 85°C (Extended Consumer) 0 bis 70°C (Consumer)
Dimensions	67.6 x 36.7 x 6.4 mm

\*All carrier board components must remain within the operating temperature at any and all times, including start-up; carrier operating temperature is independent of the module installed. Please refer to the specific module for more details. Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider specific cooling solutions for the final system.



Trizeps SODIMM SOM

SODIMM-200 CPU-Module with  
NXP i.MX 8M

Ideal for industrial/home automation, streaming audio or advanced imaging equipment

Trizeps VIII by Keith & Koep



Available in Industrial Temperature Range

Processor	NXP i.MX 8M Family based on ARM Cortex®-A53 cores + general purpose Cortex®-M4 processor: <ul style="list-style-type: none"><li>i.MX 8M Quad - 4x Cortex®-A53 cores up to 1.5GHz</li><li>i.MX 8M Dual - 2x Cortex®-A53 cores up to 1.5GHz</li><li>i.MX 8M QuadLite - 4x Cortex®-A53 cores up to 1.5GHz, no VPU</li></ul>
Memory	Optional: NXP™ Kinetis V Arm® Cortex-M0+ up to 75 MHz / 8x 16 Bit ADC, CAN, UART, SPI, GPIO Optional: Programmable FPGA, up to 4300 LUTs to convert parallel display/camera/data-streams to MIPI DSI/CSI Soldered down LPDDR4-3200 memory, 32-bit interface, up to 8GB
Graphics	Integrated Graphics Processing Unit, supports 2 independent displays. Embedded VPU, supports HW decoding of HEVC, H.264, H.263, MPEG-4, MPEG-2, AVC, VC-1, RV, DivX, VP6, VP8, VP9, JPEG (not for i.MX8M QuadLite). Supports OpenGL ES 3.1, Open CL 1.2, OpenGL 2.x, DirectX 11
Video Interfaces	HDMI v2.0a, MIPI display (4ch), Single-, Dual-LVDS or LCD 24 Bit RGB Camera Interfaces: 8bit parallel, MIPI (4ch and additional 2ch)
Video Resolution	HDMI, MIPI: up to 4k resolution
Mass Storage	Onboard 4 Bit wide µSD Card Socket or onboard 8 Bit wide eMMC
Networking	Onboard 10/100Mbit/1Gbit RGMII PHY and SIOP interface Optional: WiFi 802.11 a/b/g/n/ac 2x2 MU-MIMO / Bluetooth 4.2/5.0
USB	2x USB 3.0 OTG
PCI-e	1x PCIe
Audio	Audio Codec: Stereo Headphone output, Mono Speaker output, Stereo Line-In, Microphone input
Serial Ports	4x UART
Other Interfaces	SPDIF In/Out I2S Multichannel Serial-Audio-Interface 2x I2C SPI QSPI GPIOs PWM
Power Supply	3.3 VDC
Operating System	Linux Yocto Linux Debian Android Windows 10 IoT
Operating Temperature*	-40 bis 85°C (Industrial) -25 bis 85°C (Extended Consumer) 0 bis 70°C (Consumer)
Dimensions	67.6 x 36.7 x 6.4 mm

\*All carrier board components must remain within the operating temperature at any and all times, including start-up; carrier operating temperature is independent of the module installed. Please refer to the specific module for more details. Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider specific cooling solutions for the final system.



Trizeps SODIMM SOM

SODIMM-200 CPU-Module with  
**NXP i.MX 8M Plus**

Bringing artificial intelligence to ARM embedded edge solutions

Trizeps VIII Plus by Keith & Koep



Processor	NXP i.MX 8M Plus family SoCs: Dual or Quad ARM Cortex®-A53 Cores + general purpose Cortex® M7 800MHz processor <ul style="list-style-type: none"><li>NXP i.MX 8M Plus Quad, 4x ARM Cortex®-A53 Cores up to 1.8GHz</li><li>NXP i.MX 8M Plus Dual, 2x ARM Cortex®-A53 Cores up to 1.8GHz</li></ul> NPU: 2.3 TOPS Neural Network performance (not for Quad Lite) Optional: NXP™ Kinetis V Arm® Cortex-MO+ up to 75 MHz / 8x 16 Bit ADC, UART, SPI, GPIO, I2C Optional: Programmable FPGA, up to 4300 LUTs
Memory	Soldered down LPDDR4-4000 memory, 32-bit interface, up to 8GB
Graphics	Integrated Graphics Processing Unit GC7000UL, supports 3 independent displays. Embedded VPU, supports HW decoding of HEVC/H.265, AVC/H.264, MPEG-4, MPEG-2, MVC, VC-1, RV, VP6, VP7, VP8, VP9, JPEG, HW encoding of HEVC/H.265, AVC/H.264 Supports OpenVG 1.1, OpenGL ES 3.1, OpenCL 1.2 Full Profile and Vulkan
Video Interfaces	HDMI, MIPI display (4 channel) / Single- or Dual-LVDS, LCD 24 Bit RGB
Video Resolution	HDMI, LVDS, eDP: Up to 1920 x 1080p @60 Video-Decoder: 1080p60, h.265/4, VP9, VP8 / Video Encoder: 1080p60, h.265/4
Mass Storage	Onboard 4 Bit wide µSD Card Socket or onboard 8 Bit wide eMMC
Networking	2x Gigabit Ethernet (1x RGMII PHY and 1x RGMII interface) Optional: WiFi 802.11 a/b/g/n/ac 2x2 MU-MIMO / Bluetooth 4.2/5.0
USB	2x USB 3.0 OTG
PCI-e	Up to 1x PCI-e x1 Gen3 port
Audio	Digital: 18x I2S TDM, DSD512, S/PDIF Tx + Rx, 8 channel PDM Microphone input Analog: Stereo Headphone output, Mono Speaker output, Stereo Line-In, Microphone input
Serial Ports	4x UART 3x 4 Bit wide SDIO 3.0 SPDIF In/Out I2S Multichannel Serial-Audio-Interface
Other Interfaces	2x I2C SPI QSPI GPIOs PWMs 2x CAN
Power Supply	3.3 VDC
Operating System	Linux Yocto Linux Debian Android Windows 10 IoT
Operating Temperature*	-40 bis 85°C (industrial) -25 bis 85°C (Extended Consumer) 0 bis 70°C (Consumer)
Dimensions	67.6 x 36.7 x 6.4 mm

\*All carrier board components must remain within the operating temperature at any and all times, including start-up; carrier operating temperature is independent of the module installed. Please refer to the specific module for more details. Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider specific cooling solutions for the final system.

Trizeps SODIMM SOM

SODIMM-200 CPU-Module with  
**NXP i.MX6**

High-performance i.MX6 CPU module with compact dimensions

Trizeps VII by Keith & Koep



Processor	NXP i.MX M6 Family based on ARM® Cortex®-A9 cores <ul style="list-style-type: none"><li>i.MX 6Solo - 1x Cortex®-A9 core up to 1.0GHz</li><li>i.MX 6DualLite - 2x Cortex®-A9 cores up to 1.0GHz</li><li>i.MX 6Dual - 2x Cortex®-A9 cores up to 1.0GHz</li><li>i.MX 8Quad - 4x Cortex®-A9 cores up to 1.0GHz</li></ul>
Memory	Soldered down LPDDR3-1066 memory up to 2 GB, 64-bit interface
Graphics	Vivante GC3500 2D Hardware accelerator Vivante GC2000 3D Hardware accelerator, supports OpenGL® ES 2.0 3D Dedicated Vector Graphics accelerator, supports OpenVG™ (only i.MX 6Dual and i.MX 6Quad) Supports up to 3 independent displays with i.MX 6Dual and i.MX 6Quad Supports 2 independent displays with i.MX 6DualLite and i.MX 6Solo
Video Interfaces	HDMI v1.4, 2x LVDS, LCD 24 Bit RGB, MIPI
Video Resolution	LVDS, up to 1920x1200 HDMI, up to 1080p
Mass Storage	Onboard 4 Bit wide µSD Card Socket or onboard 8 Bit wide eMMC
Networking	1x 100 Mbit Ethernet RGMII PHY or 1000 Mbit Ethernet RGMII interface Optional: WiFi 802.11 a/b/g/n/e/i/h/d/k/r/w, Bluetooth 3.0+ EDR
USB	1x USB 2.0 OTG and 1x USB 2.0 Host
PCI-e	1 x PCI-e
Audio	AC'97 Audio Codec with 4/5 wires res. Touch and 4x 12 Bit ADC (2x comparator inputs for battery monitoring); Stereo: Line-in, Mic-in, Speaker-out, Headphone out
Serial Ports	3x UART
Other Interfaces	2x FlexCAN S-ATAII 2x 4 Bit wide SDIO RTC SPDIF Adress-Data-Bus 2x I2C 2x SPI GPIOs 2x PWM
Power Supply	3.3 VDC
Operating System	Linux Android Windows Embedded Compact 7, 2013 Windows 10 IoT Core
Operating Temperature*	-40 ÷ 85°C (industrial) -20 ÷ 85°C (Extended Consumer) 0 ÷ 70°C (Consumer)
Dimensions	67.6 x 36.7 x 6.4 mm

\*All carrier board components must remain within the operating temperature at any and all times, including start-up; carrier operating temperature is independent of the module installed. Please refer to the specific module for more details. Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider specific cooling solutions for the final system.



Trizeps SODIMM SOM

SODIMM-200 CPU-Module with  
**NXP i.MX 6SoloX**

i.MX6 CPU module with with 2 Ethernet interfaces and additional Cortex M4 co-processor

Trizeps VII SX by Keith & Koep



Processor	NXP i.MX 6SoloX, SingleCore Cortex®-A9 @ 1GHz, Cortex®-M4 core @ 227MHz
Memory	Soldered down LPDDR3-533 memory up to 2 GB, 32-bit interface
Graphics	Vivante GC400T, 2D and 3D HW accelerator OpenGL ES 2.0, OpenGL ES 1.1, OpenVG 1.1 supported
Video Interfaces	LVDS, LCD 24 Bit RGB
Video Resolution	LVDS: up to 1366x768 @60Hz RGB: up to 1920x1080p @60Hz
Mass Storage	Onboard 4 Bit wide µSD Card Socket or onboard 8 Bit wide eMMC
Networking	1x 100 Mbit Ethernet RGMII PHY and 1x 1000 Mbit Ethernet RGMII interface, can be used at the same time Optional: WiFi 802.11 a/b/g/n/e/i/h/d/k/r/w, Bluetooth 3.0+ EDR
USB	1x USB 2.0 OTG and 1x USB 2.0 Host
PCI-e	1 x PCI-e
Audio	AC'97 Audio Codec with 4/5 wires res. Touch and 4x 12 Bit ADC (2x comparator inputs for battery monitoring); Stereo: Line-in, Mic-in, Speaker-out, Headphone out
Serial Ports	3x UART 2x FlexCAN S-ATAII 2x 4 Bit wide SDIO RTC SPDIF Adress-Data-Bus 2x I2C 2x SPI GPIOs 2x PWM
Other Interfaces	
Power Supply	3.3 VDC (SODIMM) + 5 VDC and battery (FX11)
Operating System	Windows Embedded Compact 7, 2013 Linux
Operating Temperature*	-40 ÷ 85°C (industrial) -20 ÷ 85°C (Extended Consumer) 0 ÷ 70°C (Consumer)
Dimensions	67.6 x 36.7 x 6.4 mm

\*All carrier board components must remain within the operating temperature at any and all times, including start-up; carrier operating temperature is independent of the module installed. Please refer to the specific module for more details. Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider specific cooling solutions for the final system.

Carrier Board

Carrier Board for **Trizeps VII**

Multifunctional Carrier Board which supports the complete functions of the Trizeps VII SOMs

ConXT by Keith & Koep



Processor	Defined by compatible Trizeps SODIMM SOMs <ul style="list-style-type: none"><li>NXP i.MX 6 Quad, Dual, DualLite, Solo, SoloX ARM Cortex A9 up to 1.0 GHz on Trizeps VII SOM</li></ul>
Video Interfaces	RGB, LVDS, Dual LVDS
Mass Storage	SD Card Socket 2x 10/100 Mbit Ethernet RJ45 Connector
Networking	Wireless functionalities depend on Trizeps SOM: <ul style="list-style-type: none"><li>Trizeps VII: Onboard WiFi Bluetooth Modul, IEEE 802.11 a/b/g/n/e/i/h/d/k/r/w, +18 dBm, 72 Mbps (20 MHz) and up to 150 Mbps (40 MHz), Bluetooth 3.0+ DER</li></ul>
USB	USB2.0 Host, USB2.0 OTG
Audio	2.6W Audio Amplifier (pin header) Microphone (pin header)
Serial Ports	1x RS232, 1x RS232/422/485
Other Interfaces	2x CAN galvanic isolated, 12/24V I/Os (4x inputs (3 with ADC), 4x outputs), analog PAL camera (Cinrch), UPS (Uninterruptible Power Supply), RTC with battery, 2x LED, I2C, GPIOs
Power Supply	Industrial +12 up to +24V supply
Operating System	Windows Embedded Compact Linux Debian Windows 10 IoT
Operating Temperature*	-20 ÷ 85°C
Dimensions	174 mm x 104 mm x 20 mm

\*All carrier board components must remain within the operating temperature at any and all times, including start-up; carrier operating temperature is independent of the module installed. Please refer to the specific module for more details. Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider specific cooling solutions for the final system.





Carrier Board for **Trizeps** SODDIM SOMs

Carrier Board for TrizepsVII, Trizeps VIII, Trizeps VIII Mini, Trizeps VIII Nano and Trizeps VIII Plus SOMs

iP5-Base by Keith & Koep



Available in Industrial Temperature Range

Processor	Defined by compatible Trizeps SODIMM SOMs <ul style="list-style-type: none"><li>NXP i.MX 6 Quad, Dual, DualLite, Solo, SoloX ARM Cortex A9 up to 1.0 GHz on Trizeps VII SOM</li><li>NXP i.MX 8M ARM Cortex A53 up to 1.5 GHz, up to Quad Core, integrated ARM Cortex M4 on Trizeps VIII SOM</li><li>NXP i.MX 8M Mini ARM Cortex A53 up to 1.8 GHz, up to Quad Core, integrated ARM Cortex M4 on Trizeps VIII Mini SOM</li><li>NXP i.MX 8M Nano ARM Cortex A53 up to 1.5 GHz, up to Quad Core, integrated ARM Cortex M7 on Trizeps VIII Nano SOM</li><li>NXP i.MX 8M Plus ARM Cortex A53 up to 1.8 GHz, up to Quad Core, integrated ARM Cortex M7 on Trizeps VIII Plus SOM</li></ul>
Video Interfaces	RGB, LVDS, Dual LVDS, HDMI (with Trizeps VII, Trizeps VIII, Trizeps VIII Plus)
Mass Storage	µSD Card Socket
Networking	10/100 Mbit Ethernet RJ45 Connector Wireless functionalities depend on Trizeps SOM: <ul style="list-style-type: none"><li>Trizeps VII: Onboard WiFi Bluetooth Modul, IEEE 802.11 a/b/g/n/e/ i/h/d/k/r/w, +18 dBm, 72 Mbps (20 MHz) and up to 150 Mbps (40 MHz), Bluetooth 3.0+ EDR</li><li>Trizeps VIII and Trizeps VIII Mini: Onboard WiFi-Bluetooth module, WiFi 2.4GHz/5Ghz, 802.11 a/b/g/n/ac 2x2 MU-MIMO / Bluetooth 5.0</li></ul>
USB	USB2.0 Host, USB2.0 OTG
Audio	SL2-40 pin header: stereo headphone (16R and 32R), speaker (Mono, 8R), Lineln, microphone
Serial Ports	RS232 and RS485 via D-SUB SL2-40 pin header: 2x UART
Other Interfaces	4 wire resistive touch interface, Realtime Clock with Backup Cap or battery, LED, 3-Axis 12-bit/8-bit digital accelerometer, temp. sensor, SATA II connector, I2C extension header, reset and user tactile switch, powerfail detection, CAN 1x 40-pin extension connector: GPIOs (1x with PWM), SPDIF (out and in), 2x CAN, SDIO, I2C, 3 x ADC
Power Supply	Industrial +12 up to +24V supply
Operating System	Linux Yocto Linux Debian Android Windows 10 IoT
Operating Temperature*	-20 ÷ 85°C
Dimensions	118.5 mm x 77.6 mm x 23.4 mm

\*All carrier board components must remain within the operating temperature at any and all times, including start-up; carrier operating temperature is independent of the module installed. Please refer to the specific module for more details. Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider specific cooling solutions for the final system.



Carrier Board for **Trizeps** SODDIM SOMs

Carrier Board for Trizeps VII, Trizeps VIII, Trizeps VIII Mini, Trizeps VIII Nano and Trizeps VIII Plus SOMs

pConXS by Keith & Koep



Available in Industrial Temperature Range

Processor	Defined by compatible Trizeps SODIMM SOMs <ul style="list-style-type: none"><li>NXP i.MX 6 Quad, Dual, DualLite, Solo, SoloX ARM Cortex A9 up to 1.0 GHz on Trizeps VII SOM</li><li>NXP i.MX 8M ARM Cortex A53 up to 1.5 GHz, up to Quad Core, integrated ARM Cortex M4 on Trizeps VIII SOM</li><li>NXP i.MX 8M Mini ARM Cortex A53 up to 1.8 GHz, up to Quad Core, integrated ARM Cortex M4 on Trizeps VIII Mini SOM</li><li>NXP i.MX 8M Nano ARM Cortex A53 up to 1.5 GHz, up to Quad Core, integrated ARM Cortex M7 on Trizeps VIII Nano SOM</li><li>NXP i.MX 8M Plus ARM Cortex A53 up to 1.8 GHz, up to Quad Core, integrated ARM Cortex M7 on Trizeps VIII Plus SOM</li></ul>
Mass Storage	SD Card Socket
Networking	10/100/1000 Mbit Ethernet RJ45 Connector  Wireless functionalities depend on Trizeps SOM: <ul style="list-style-type: none"><li>Trizeps VII: Onboard WiFi Bluetooth Modul, IEEE 802.11 a/b/g/n/e/i/h/d/k/r/w, +18 dBm, 72 Mbps (20 MHz) and up to 150 Mbps (40 MHz), Bluetooth 3.0+ EDR</li><li>Trizeps VIII and Trizeps VIII Mini: Onboard WiFi-Bluetooth module, WiFi 2.4GHz/5Ghz, 802.11 a/b/g/n/ac 2x2 MU-MIMO / Bluetooth 5.0</li></ul>
USB	USB2.0 Host, USB2.0 OTG, USB2.0 touch interface, USB2.0 Header
PCI-e	Mini PCIe Half-/Full Size card edge connector, combined with nano SIM card slot
Video Interfaces	RGB, LVDS, Dual LVDS, HDMI (with Trizeps VII, Trizeps VIII, Trizeps VIII Plus)
Audio	3.5mm Stereo Jack, Digital Microphone Connector SL2-40 pin header: stereo headphone (16R and 32R), speaker (Mono, 8R), Lineln, microphone
Serial Ports	RS232 via D-SUB SL2-40 pin header: 2x UART
Other Interfaces	4 wire resistive touch interface, Realtime Clock with Backup Cap or battery, LED, 3-Axis 12-bit/8-bit digital accelerometer, temp. sensor, SATA II connector, I2C extension header, reset and user tactile switch, powerfail detection, analog BNC / Mini BNC parallel camera interface, MIPI camera connector 1x 40-pin extension connector: GPIOs (1x with PWM), SPDIF (out and in), 2x CAN, SDIO, I2C, 3 x ADC
Power Supply	Industrial +12 up to +24V supply
Operating System	Linux Yocto Linux Debian Android Windows 10 IoT
Operating Temperature*	-20 ÷ 85°C
Dimensions	118.5 mm x 84.0 mm x 43.0 mm

\*All carrier board components must remain within the operating temperature at any and all times, including start-up; carrier operating temperature is independent of the module installed. Please refer to the specific module for more details. Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider specific cooling solutions for the final system.



SODIMM-200 Carrier Board for **Trizeps**

SODIMM 200 Carrier Board supporting Trizeps VII and Trizeps VIII Nano/Mini/Plus SOMs

pConXS III by Keith & Koep



Available in Industrial Temperature Range

Processor	Depends on compatible Trizeps SODIMM 200 SOMs <ul style="list-style-type: none"><li>NXP i.MX 6 Quad, Dual, DualLite, Solo, SoloX ARM Cortex A9 up to 1.0 GHz on Trizeps VII SOM</li><li>NXP i.MX 8M ARM Cortex A53 up to 1.5 GHz, up to Quad Core, integrated ARM Cortex M4 on Trizeps VIII SOM</li><li>NXP i.MX 8M Mini ARM Cortex A53 up to 1.8 GHz, up to Quad Core, integrated ARM Cortex M4 on Trizeps VIII Mini SOM</li><li>NXP i.MX 8M Nano ARM Cortex A53 up to 1.5 GHz, up to Quad Core, integrated ARM Cortex M7 on Trizeps VIII Nano SOM</li><li>NXP i.MX 8M Plus ARM Cortex A53 up to 1.8 GHz, up to Quad Core, integrated ARM Cortex M7 on Trizeps VIII Plus SOM</li></ul>
Mass Storage	SD card socket
Networking	Gigabit Ethernet RJ45 connectors Wireless functionalities depend on Trizeps SOM: <ul style="list-style-type: none"><li>Trizeps VII: Onboard WiFi Bluetooth Modul, IEEE 802.11 a/b/g/n/e/i/h/d/k/r/w, +18 dBm, 72 Mbps (20 MHz) and up to 150 Mbps (40 MHz), Bluetooth 3.0+ EDR</li><li>Trizeps VIII and Trizeps VIII Mini/Plus: Onboard WiFi-Bluetooth module, WiFi 2.4GHz/5Ghz, 802.11 a/b/g/n/ac 2x2 MU-MIMO / Bluetooth 5.0</li></ul>
USB	1x USB 3.0 OTG and 1x USB 2.0 Host via USB A connectors, 3x USB 2.0 Host via internal connectors
PCI-e	Mini PCIe Half-/Full Size card edge connector, combined with nano SIM card slot
Video Interfaces	LVDS (KuK Modis Standard), Dual-LVDS, 18 Bit parallel RGB display port, HDMI (with Trizeps VII, Trizeps VIII, Trizeps VIII Plus), capacitive touch, resistive touch
Audio	3.5 mm stereo audio head-phone jack SL2-40 pin header: stereo headphone (16R and 32R), speaker (Mono, 8R), Lineln, microphone
Serial Ports	RS232 D-Sub i-MOD FFC connectors: UART SL2-40 pin header: UART
Other Interfaces	Realtime Clock with Backup Cap or battery LED 3-Axis 12-bit/8-bit digital accelerometer digital temperature sensor reset and user tactile switch powerfail detection MIPI camera connector analog BNC / Mini BNC parallel camera interface (optional) 2x CAN via i-MOD FFC connector or SL2-40 pin header i-MOD FFC connectors: I2C, resistive Touch SL2-40 pin header: Power, GPIOs (1x with PWM), SPDIF (out and in), SDIO, I2C, 3x ADC
Power Supply	Industrial +12 up to +24V supply
Operating System	Linux Yocto Linux Debian Android Windows 10 IoT
Operating Temperature*	-20 ÷ 85°C
Dimensions	133.0 x 93.5 x 25.0 mm

\*All carrier board components must remain within the operating temperature at any and all times, including start-up; carrier operating temperature is independent of the module installed. Please refer to the specific module for more details. Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider specific cooling solutions for the final system.



HMI for **Trizeps** SODIMM SOMs

HMI with Trizeps SODIMM SOM tech supporting Trizeps VII and Trizeps VIII Nano/Mini/Plus

i-PAN T7 II by Keith & Koep



Available in Industrial Temperature Range

Processor	Depends on compatible Trizeps SODIMM SOMs <ul style="list-style-type: none"><li>NXP i.MX 6 Quad, Dual, DualLite, Solo, SoloX ARM Cortex A9 up to 1.0 GHz on Trizeps VII SOM</li><li>NXP i.MX 8M ARM Cortex A53 up to 1.5 GHz, up to Quad Core, integrated ARM Cortex M4 on Trizeps VIII SOM</li><li>NXP i.MX 8M Mini ARM Cortex A53 up to 1.8 GHz, up to Quad Core, integrated ARM Cortex M4 on Trizeps VIII Mini SOM</li><li>NXP i.MX 8M Nano ARM Cortex A53 up to 1.5 GHz, up to Quad Core, integrated ARM Cortex M7 on Trizeps VIII Nano SOM</li><li>NXP i.MX 8M Plus ARM Cortex A53 up to 1.8 GHz, up to Quad Core, integrated ARM Cortex M7 on Trizeps VIII Plus SOM</li></ul>
Graphics	Depends on compatible Trizeps SODIMM SOMs
Video Interfaces	MIPI-CSI Camera interface connector
Video Resolution	7.0 inch LVDS Display, IPS technology, resolution 1024 x 600, LED lifetime min. 30k hours, typ. 500 cd/qm brightness, P-Cap (Projected Capacitive touch screen), Glass thickness 1.8 mm
Mass Storage	µSD Card Socket
Networking	Gigabit Ethernet RJ45 connector  Wireless functionalities depend on Trizeps SODIMM SOMs: <ul style="list-style-type: none"><li>Trizeps VII: Onboard WiFi Bluetooth Modul, IEEE 802.11 a/b/g/n/e/i/h/d/k/r/w, +18 dBm, 72 Mbps (20 MHz) and up to 150 Mbps (40 MHz), Bluetooth 3.0+ EDR</li><li>Trizeps VIII and Trizeps VIII Mini/Plus: Onboard WiFi-Bluetooth module, WiFi 2.4GHz/5Ghz, 802.11 a/b/g/n/ac 2x2 MU-MIMO / Bluetooth 5.0</li></ul>
USB	USB 2.0 Host, µUSB 2.0 OTG / USB via i-MOD extension connector
Audio	3,5 mm Headset Jack for Microphone and Headphone Solderpads for Speaker (2.6 W Audio Amplifier), Headphone, Microphone
Serial Ports	UART via i-MOD extension connector
Other Interfaces	I2C, CAN, Keys via i-MOD extension connectors SPI via solderpads Realtime Clock with Backup Cap LED Powerfail Detection
Power Supply	Industrial +12 up to 24V supply / Power over Ethernet (POE) on request
Operating System	Microsoft Windows 10 IoT Linux Android
Operating Temperature*	-20 ÷ 70°C
Dimensions	178.0 x 108.7 x 27.6 mm (include housing)

\*All carrier board components must remain within the operating temperature at any and all times, including start-up; carrier operating temperature is independent of the module installed. Please refer to the specific module for more details. Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider specific cooling solutions for the final system.



HMI for **Trizeps** SODIMM SOMs

HMI with Trizeps SODIMM SOM technology  
which supporting Trizeps CPU modules

**i-PAN7** by Keith & Koep



Available in Industrial  
Temperature Range

Processor	Depends on compatible Trizeps SODIMM SOMs, i.e. <ul style="list-style-type: none"><li>NXP i.MX 6 Quad, Dual, DualLite, Solo, SoloX ARM Cortex A9 up to 1.0 GHz on Trizeps VII SOM</li></ul>
Graphics	Depends on compatible Trizeps SODIMM SOMs
Video Resolution	7.0 inch 18bpp Display, resolution 800 x 480
Mass Storage	SD Card Socket
Networking	10/100 MBit Ethernet RJ45 connector Wireless functionalities depend on Trizeps SODIMM SOMs
USB	USB 2.0 Host, USB 2.0 OTG
Audio	3,5 mm Headset Jack for Microphone and Headphone Solderpads for Speaker (2.6 W Audio Amplifier), Headphone, Microphone
Serial Ports	3x UART via extension connector
Other Interfaces	Inputs/Outputs, I2C, CAN, SDIO, Stereo Headphone Output, Microphone Input, LED, Realtime Clock, Powerfail Detection, GPIO
Power Supply	Industrial +12 up to 24V supply
Operating System	Microsoft Windows Embedded Compact Linux Android
Operating Temperature*	'0 ÷ 70°C / -20 ÷ 85°C on request
Dimensions	169.4 x 108.4 x 18.2 mm (include housing)

\*All carrier board components must remain within the operating temperature at any and all times, including start-up; carrier operating temperature is independent of the module installed. Please refer to the specific module for more details. Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider specific cooling solutions for the final system.





## SINGLE BOARD COMPUTER ADVANTAGES



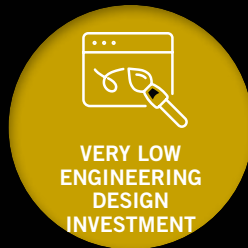
READY FOR  
SYSTEMS  
INTEGRATION



REDUCED  
TIME-TO-MARKET



BEST PRICE POINT  
FOR LOW VOLUME  
PROJECTS



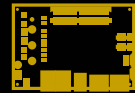
VERY LOW  
ENGINEERING  
DESIGN  
INVESTMENT



OFF-THE-SHELF  
SOLUTIONS



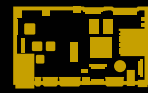
Embedded NUC™



3.5"



Pico-ITX



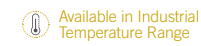
other SBCs



3.5" SBC with 11th Gen Intel® Core™ and Celeron® (formerly Tiger Lake UP3)

11th Gen Intel® Core™ Edge Compute with power-efficient compute and graphics

PRISMA



Processor	Intel® Core™ i7-1185G7E, Quad Core @2.8GHz (4.4GHz Turbo) with HT, 12MB Cache, 28W TDP (12W cTDP) Intel® Core™ i5-1145G7E, Quad Core @2.6GHz (4.1GHz Turbo) with HT, 8MB Cache, 28W TDP (12W cTDP) Intel® Core™ i3-1115G4E, Dual Core @3.0GHz (3.9GHz Turbo) with HT, 6MB Cache, 28W TDP (12W cTDP) Intel® Celeron® 6305E, Dual Core @1.8GHz, 4MB Cache, 15W TDP Intel® Core™ i7-1185GRE, Quad Core @2.8GHz (4.4GHz Turbo) with HT, 12MB Cache, with IBEC, 28W TDP (12W cTDP) – Industrial Intel® Core™ i5-1145GRE, Quad Core @2.6GHz (4.1GHz Turbo) with HT, 8MB Cache, with IBEC, 28W TDP (12W cTDP) – Industrial Intel® Core™ i3-1115GRE, Dual Core @3.0GHz (3.9GHz Turbo) with HT, 6MB Cache, with IBEC, 28W TDP (12W cTDP) – Industrial
Memory	2x DDR4-3200 SODIMM slots Up to 64GB with IBEC supported only with Intel® Core™ Industrial SoCs
Graphics	Up to two video decode boxes (VDBoxes) for enhanced video stream capabilities Support for up to 48 simultaneous 1080p streams ingestion Support for up to four independent displays at up to 4K60 HDR resolution or one display at 8K resolution
Video Interfaces	2x Multimode DisplayPort 1.4, on Dual DP++ connector 2x Multimode Display Port 1.4 on USB Type-C connectors (alternate mode)
Video Resolution	1x eDP 1.3 or Single/Dual-Channel 18-/24-bit LVDS interface DP, eDP Up to 5120x3200 @60Hz 24bpp / 7680x4320 @60Hz 30bpp with DSC
Mass Storage	HDMI 1.4 Up to 4Kx2K 24-30Hz 24bpp M.2 SATA SSD slot (socket 2 Key B type 2242/3042) ** M.2 NVMe slot (socket 3 Key M type 2280) PCIe Gen4 supported
Networking	2x NBase-T Ethernet interfaces, supporting 2.5Gb Ethernet connection, managed by as many Intel® i225 2.5GbE controllers M.2 WWAN slot (socket 2 Key B type 2242/3042) coupled to on-board Nano SIM slot. ** M.2 Wi-Fi/BT slot (socket 1 Key E type 2230)
USB	2x SuperSpeed USB 10Gbps ports on Dual type-A socket 2x SuperSpeed USB 20Gbps ports on USB type-C slots 2x USB 2.0 on pin header
Audio	HD audio codec / Cirrus Logic CS4207 Mic In, Line Out and S/PDIF Out, on pin header
Serial Ports	2x RS-232/RS-422/RS-485 UARTS software configurable, on pin header
Other Interfaces	2x Expansion M.2 slot (socket 3 Key M type 2280) with 4x PCIe Gen3 lanes 8x GPIOs, 2x I2C, SPI connectors FAN connector RST_BTN#, PWR_BTN# and activity LED signals on pin header Optional TPM 2.0 on-board
Power Supply	+12V <sub>dc</sub> .. +24V <sub>dc</sub> range Cabled coin cell battery for RTC
Operating System	Microsoft® Windows 10 IoT Enterprise LTSC Linux LTS Yocto
Operating Temperature*	0°C ÷ +60°C (Commercial version) -40°C ÷ +85°C (Industrial version)
Dimensions	146 x 102 mm (3.5" form factor)

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will depend on the application, enclosure, and/or environment. Each customer must consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.

\*\*SATA SSD and WWAN functionalities share the same slot and are therefore mutually exclusive.



Pico-ITX SBC with Intel® Atom® X6000E, Pentium® and Celeron® J / N Series (formerly Elkhart Lake)

Compact Size & High Performance SBC with a multicore SoC

ICARUS



Processor	Intel® Celeron® J6413 Quad Core @ 1.8GHz (3GHz Turbo) 10W TDP Intel® Celeron® N6211 Dual Core @1.2GHz (3GHz Turbo) 6.5W TDP Intel® Pentium® J6426 Quad Core @2.0GHz (3GHz Turbo) 10W TDP Intel® Pentium® N6415 Quad Core @1.2GHz (3GHz Turbo) 6.5W TDP Intel® Atom™ x6211E Dual Core @1.3GHz (3GHz Turbo) 6W TDP w/ IBEC and IHS - Industrial Intel® Atom™ x6413E Quad Core @1.5GHz (3GHz Turbo) 9W TDP w/ IBEC and IHS - Industrial Intel® Atom™ x6425E Quad Core @2.0GHz (3GHz Turbo) 12W TDP w/ IBEC and IHS - Industrial Intel® Atom™ x6212RE Dual Core @1.2GHz (no Turbo) 6W TDP w/ IBEC, IHS and TCC – Industrial Intel® Atom™ x6414RE Quad Core @1.5GHz (no Turbo) 9W TDP w/ IBEC, IHS and TCC – Industrial Intel® Atom™ x6425RE Quad Core @1.9GHz (no Turbo) 12W TDP w/ IBEC, IHS and TCC – Industrial
Memory	(*) IHS: Integrated heat spreader; TCC: Time Coordinated Computing Soldered down LPDDR4-3200 memory, up to 16GB with IBEC supported only with Atom™ industrial SoCs Speed: 4267MT/s single rank (1GB / 2GB / 4GB / 8GB), 3733MT/s dual rank (16GB)
Graphics	Up to 3 independent displays Integrated Intel® Gen11 UHD Graphics controller with up to 32 EU 4K HW decoding and encoding of HEVC (H.265), H.264, VP8, VP9, WMV9/VC1 (decoding only) DirectX 12.1, OpenGL ES 3.1, OpenGL 4.5, OpenCL™ 1.2, Vulkan 1.0
Video Interfaces	2x Multimode DisplayPort 1.4, on Dual DP++ Connector 1x eDP 1.3 or Single/Dual-Channel 18-/24-bit LVDS interface
Video Resolution	Up to 4096x2160 @60Hz
Mass Storage	Optional eMMC 5.1 drive soldered on-board M.2 SATA SSD slot (Socket 2 Key B Type 2242/3042) coupled to on-board Nano SIM slot. ** 1x SATA Gen3 7 pins M connector
Networking	2x Gigabit Ethernet PHY with precision clock synchronization and synchronous Ethernet clock output for IEEE 1588 M.2 WWAN Slot for Modems (Socket 2 Key B Type 2242/3042) ** M.2 WLAN Connectivity Slot for Wi-Fi/Bluetooth (Socket 1 Key E Type 2230)
USB	Dual SuperSpeed USB 10Gbps Standard-A connector Dual USB 2.0 pin header
Audio	HD Audio codec / Cirrus Logic CS4207 Mic In, Line Out and S/PDIF Out, on pin header
Serial Ports	2x RS-232/RS-422/RS-485 UARTs (software configurable) on pin header
Other Interfaces	8x GPIOs, I2C, SPI connectors 2x CAN connector Fan connector RST_BTN#, PWR_BTN# and activity LED signals on pin header Optional TPM 2.0 on-board
Power Supply	+12V <sub>dc</sub> Cabled coin cell battery for RTC
Operating System	Microsoft® Windows 10 IoT Enterprise Linux Yocto
Operating Temperature*	0°C ÷ +60°C (Commercial version) -40°C ÷ +85°C (Industrial version)
Dimensions	100 x 72 mm (3,93" x 2,83")

\* Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.

\*\* SATA SSD and WWAN functionalities share the same slot and are therefore mutually exclusive.





SBC

3.5" SBC with Rockchip PX30

High-performance application processor designed for digital multimedia applications

JUNO



Rockchip  
瑞芯微电子



	Processor	Rockchip PX30 processor, 4x Cortex®-A35 cores
	Max Cores	4
	Memory	Soldered-down DDR3L memory, up to 4GB total, 32-bit interface
	Graphics	Mali-G31 GPU with High performance dedicated 2D processor OpenGL ES 1.1 / 2.0 / 3.2, Vulkan 1.0, OpenCL 2.0, DX11 FL9_3 Embedded VPU, able to offer: <ul style="list-style-type: none"><li>Multi-format 1080p 60fps video decoders (H.265, H.264, VC-1, MPEG-4, VP8)</li><li>H.264 1080p@30fps HW encoding</li></ul> Supports 2 independent video outputs
	Video Interfaces	LVDS Single / Dual Channel interface HDMI interface
	Video Resolution	HDMI Up to 1920x1080p LVDS Up to 1280x800
	Mass Storage	eMMC 5.1 Drive soldered on-board, up to 64GB Optional microSD Slot
	Networking	1x 10/100 Ethernet port Optional M.2 Socket 1 Key E Slot for WiFi/BT LE external modules Optional miniPCI-e slot (USB interface only) for external modem modules
	USB	3x USB 2.0 Host ports on standard Type-A slots USB Recovery internal connector 2x USB 2.0 ports on internal pin headers
	Audio	PMIC embedded Audio Codec Stereo audio out on internal header TRRS combo jack for Headphone and Mic In Line Out audio jack or I2S Audio Class-D amplifier with stereo out available on internal connector (factory alternatives) Buzzer on-board
	Serial Ports	1x TTL or RS-232 port (factory alternative) 1x Debug UART 1x TTL or RS-232 port (factory alternatives to microSD slot) 1x RS-485 port on internal connector 1x CAN port
	Other Interfaces	miniSIM Slot for USB Modem modules on miniPCI-e form factor Optional CSI Camera connector Ultra-low Power RTC Trusted Secure Element 4-Channel LED Driver connector Microcontroller Programmable Interfaces: 2x 4-Wire UARTs on internal connector 2x 2-Wire UARTs on internal connector 1x SPI connector 2x I2C on internal connector 8-channel timer connector 16x GPIOs @3.3V (5V tolerant) 16x GPIOs @3.3V
	Power Supply	+12V <sub>DC</sub> ÷ +24V <sub>DC</sub> RTC battery
	Operating System	Linux Yocto Android
	Operating Temperature*	0°C ÷ +60°C (Commercial Temperature range) -20°C÷ +85°C (Extended Temperature range)
	Dimensions	146 x 102 mm (3.5" form factor)

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.

SBC

3.5" SBC with  
AMD Ryzen™ Embedded R1000 / V1000

Full connectivity on powerful AMD Ryzen™ platform

MERIDA



AMD



Available in Industrial Temperature Range

	Processor	AMD Ryzen™ Embedded V1000 family SoCs: <ul style="list-style-type: none"><li>AMD Ryzen™ Embedded <b>V1807B</b> with AMD Radeon™ Vega 11 Graphics, Quad Core Dual Thread @ 3.35GHz (3.8 Boost), TDP 35-54W</li><li>AMD Ryzen™ Embedded <b>V1756B</b> with AMD Radeon™ Vega 8 Graphics, Quad Core Dual Thread @ 3.25GHz (3.6 Boost), TDP 35-54W</li><li>AMD Ryzen™ Embedded <b>V1605B</b> with GPU AMD Radeon™ Vega 8, Quad Core Dual Thread @ 2.0GHz (3.6 Boost), TDP 12-25W</li><li>AMD Ryzen™ Embedded <b>V1202B</b> with GPU AMD Radeon™ Vega 3, Dual Core Dual Thread @ 2.3GHz (3.2 Boost), TDP 12-25W</li></ul> AMD Ryzen™ Embedded R1000 family SoCs: <ul style="list-style-type: none"><li>AMD Ryzen™ Embedded <b>R1606G</b> with GPU AMD Radeon™ Vega 3, Dual Core Dual Thread @ 2.6GHz (3.5 Boost), TDP 12-25W</li><li>AMD Ryzen™ Embedded <b>R1505G</b> with GPU AMD Radeon™ Vega 3, Dual Core Dual Thread @ 3.25GHz (3.6 Boost), TDP 12-25W</li></ul>
	Max Cores	4
	Memory	2x DDR4 ECC and non-ECC SODIMM Slots Support DDR4-2400 memories (DDR4-3200 with V1807B and V1756B), up to 32GB total
	Graphics	GPU AMD Radeon™ VEGA with up to 11 Compute Units DirectX® 12 supported H.265 (10-bit) decode and 8-bit video encode VP9 decode 4 independent displays supported (3 with R1000 SoCs)
	Video Interfaces	4x DP++ connectors (only 3 working with R1000 SoCs)
	Video Resolution	DP++: Up to 4096 x 2160
	Mass Storage	M.2 NVMe slot (Socket 2 Key M Type 2280), PCI-e x4 interface microSD Card slot (combo with miniSIM slot) 2x SATA 7p M connectors w/ 1x power connector
	Networking	Up to 2 x Gigabit Ethernet ports M.2 WWAN slot (Socket 2 Key B Type 2242/3042) for Modems M.2 Connectivity Slot (Socket 1 Key E Type 2230)
	USB	2 x USB 3.0 Host ports on USB 3.0 Type-A sockets 2 x USB 2.0 Host ports on internal pin header 1 x USB 3.0 (V1000 SoCs) / USB 2.0 (R1000 SoCs) Host port on WWAN M.2 slot 1 x USB 2.0 Host port on M.2 Connectivity Slot
	Audio	HD Audio codec Line Out + Microphone + S/PDIF Out interfaces on internal pin header
	PCI-e	1 x PCI-e x4 port on M.2 NVMe Slot 1 x PCI-e x1 port on M.2 WWAN Slot 1 x PCI-e x1 port on M.2 Connectivity Slot 2x PCI-e x1 on Gigabit Ethernet Controllers
	Serial Ports	2 x RS-232/RS-422/RS-485 UARTS, on internal Pin Header
	Other Interfaces	miniSIM slot for M.2 modems (combo with microSD slot) 8 x GPIOs connector FAN connector Switch / LED Front Header connector 2x I2C on internal pin header Antitamper connector Optional TPM 1.2 or 2.0 onboard
	Power Supply	+12V <sub>DC</sub> ÷ +24V <sub>DC</sub> RTC battery
	Operating System	Microsoft® Windows 10 (64-bit) Linux
	Operating Temperature*	0°C ÷ +60°C (Commercial version) -40°C ÷ +85°C (Industrial version, only for future SoCs in extended temperature range and with TDP ≤25W)
	Dimensions	146 x 102 mm (3.5" form factor)

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.



SBC

3.5" SBC with NXP i.MX 8M Mini

Compact Size & High Performance SBC with a multicore SoC

ASTRID



GOLD PARTNER  
NXP

early access



Available in Industrial Temperature Range

	Processor	NXP i.MX 8M Mini Family based on Arm® Cortex®-A53 cores + general purpose Cortex®-M4 400MHz processor: <ul style="list-style-type: none"><li><b>i.MX 8M Mini Quad</b> – Full featured, 4x Cortex®-A53 cores up to 1.8GHz</li><li><b>i.MX 8M Mini Dual</b> – Full featured, 2x Cortex®-A53 cores up to 1.8GHz</li><li><b>i.MX 8M Mini Solo</b> – Full featured, 1x Cortex®-A53 cores up to 1.8GHz</li><li><b>i.MX 8M Mini Quad Lite</b> –4x Cortex®-A53 cores up to 1.8GHz, no VPU</li><li><b>i.MX 8M Mini Dual Lite</b> –2x Cortex®-A53 cores up to 1.8GHz , no VPU</li><li><b>i.MX 8M Mini Solo Lite</b> –1x Cortex®-A53 cores up to 1.8GHz, no VPU</li></ul>
	Max Cores	4+1
	Memory	Soldered-down LPDDR4 memory, up to 4GB total, 32-bit interface
	Graphics	GC320 2D accelerator + GCNanoUltra 3D accelerator Embedded VPU (not for Lite processors), able to offer: <ul style="list-style-type: none"><li>VP9, HEVC/H.265, AVC/H.264, VP8 HW Decoding</li><li>AVC/H.264, VP8 HW encoding</li></ul> OpenGL ES 2.0, OpenVG 1.1 support
	Video Interfaces	LVDS Single/Dual Channel connector <b>or</b> eDP connector (factory alternatives) MIPI-CSI Camera interface connector
	Video Resolution	Up to 1920x1080p60, 24bpp
	Mass Storage	Optional eMMC 5.1 drive on-board, up to 64GB MicroSD slot 2Kb I2C Flash QSPI Flash
	Networking	2x GbEthernet interfaces (1 optional) Optional shielded ultra-small dual Band WiFi 802.11 a/b/g/n/ac with Bluetooth 5.0 module onboard Optional soldered on-board LTE Cat 4 Modem with microSIM slot or Telenor eSIM with 5MB Bundle
	USB	2x USB 2.0 Host ports on Type-A socket 2x USB 2.0 Host ports on internal pin header 1x USB Host or client port on micro-AB connector (interface shared with the optional on-board modem)
	Audio	Digital Mic In connector (2x PDM inputs) Amplified mono Speaker Output
	Serial Ports	Up to 2x RS-232 or RS-485 or CAN Serial ports (factory options, shared with GPIOs and SPI interfaces) 2x Debug UARTS
	Other Interfaces	I/O Connectors with: <ul style="list-style-type: none"><li>2xPWM @3.3V</li><li>GP I2C interface @3.3V</li><li>1x Open Drain output (max 12V, 250mA)</li><li>2x GPIOs @3.3V</li><li>1xRS-232 <b>or</b> 1x RS-485 <b>or</b> 4x GPIOs / 1x UART <b>or</b> 1x CAN (factory options)</li><li>1xRS-232 <b>or</b> 1x RS-485 <b>or</b> 4x GPIOs / 1x UART <b>or</b> 1x CAN + on-board ultra-low power RTC (factory options)</li></ul> Watchdog Dedicated connector for I2C Touch Screen Controller Support Onboard Buzzer (Comm. temp. range only) Optional Ultra Low Power RTC
	Power Supply	+12V <sub>DC</sub> ÷ +24V <sub>DC</sub>
	Operating System	Yocto Android (planned)
	Operating Temperature*	0°C ÷ +60°C (Commercial version) -40°C ÷ +85°C (industrial version, limited to -30°C ÷ +85°C with WiFi/BT module on-board)
	Dimensions	146x102 mm (3.5" form factor)

\*Measured at any point of SECO standard heatsink for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.

SBC

3.5" SBC with NXP i.MX 8X

Ideal for certified performance requirements and safety efficient

VESTA



GOLD PARTNER  
NXP



Available in Industrial Temperature Range

	Processor	NXP i.MX 8X family SoCs: Dual or Quad Arm Cortex®-A35 Cores + 1x Cortex® M4F core for real-time processing <ul style="list-style-type: none"><li>NXP i.MX8 QuadXplus, 4x Arm Cortex®-A35 Cores + 1x Cortex® M4F core for real-time processing</li><li>NXP i.MX8 DualXplus, 2x Arm Cortex®-A35 Cores + 1x Cortex® M4F core for real-time processing</li></ul>
	Max Cores	4+1
	Memory	Soldered down LPDDR4 memory @ 1200MHz, 32-bit interface, up to 4GB
	Graphics	Embedded GC7000Lite GPU Supports OpenGL 3.0, 2.1, OpenGL ES 3.1, OpenCL 1.2 Full Profile and 1.1, OpenVG 1.1, and Vulkan Embedded VPU, supports HW decoding of HEVC/H.265, AVC/H.264, MPEG-2, VC-1, RV10, VP8, H.263 and MPEG4.2t, HW encoding of AVC/H.264 2 independent displays supported
	Video Interfaces	Factory options: <ul style="list-style-type: none"><li>eDP 4-lane interface + LVDS single Channel 18-/24-bit interface</li><li>LVDS Dual Channel / 2 x LVDS Single Channel interface</li></ul>
	Video Resolution	Up to 1080p60
	Mass Storage	Soldered onboard eMMC 5.1 Drive, up to 64GB QSPI NOR Flash soldered on-board
	Networking	Up to 2 x Gigabit Ethernet ports On-board WiFi 802.11 a/b/g/n + BT 5.0 module, optional
	USB	1x USB 3.0 Host ports on USB 3.0 Type-A socket 1x USB OTG Port on micro-AB connector (interface shared with USB 2.0 interface of USB 3.0 Type-A socket) 2x USB 2.0 Host ports on Dual Type-A socket 1x USB 2.0 Host port on miniPCI-e Slot
	Audio	I2S Audio codec Mic In + Hp-Out on TRRS combo connector Line Out + 2x Mic-In interfaces on internal connector
	PCI-e	Optional mini PCI-e Slot
	Serial Ports	1x UART on expansion connector, optionally with RS-232 interface 1x UART on expansion connector, optionally with RS-485 interface 1x CAN port, available at TTL Level on expansion connector or with CAN transceiver on dedicated connector 2x Debug UARTs on dedicated connectors
	Other Interfaces	Available on expansion connector: <ul style="list-style-type: none"><li>16x GPIOs</li><li>I2C interface</li><li>2x analog inputs</li><li>1x PWM</li></ul> Power and reset button input on dedicated connector
	Power Supply	Factory option, +12VDC or +24 VDC input voltage DC power jack or 2-poles PCB terminal block for voltage supply RTC battery
	Operating System	Linux
	Operating Temperature*	-40°C ÷ +85°C (Industrial version)
	Dimensions	146 x 102 mm (3.5" form factor)

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.





SBC

3.5" SBC with NXP i.MX8

Industrial Arm solution for IoT edge computing applications

THEMIS



Processor	NXP i.MX 8 Family: <b>i.MX 8QuadMax</b> : 2x Arm Cortex®-A72 + 4x ARM® Cortex®-A53 + 2x Cortex®-M4F <b>i.MX 8QuadPlus</b> : 1x Arm Cortex®-A72 + 4x ARM® Cortex®-A53 + 2x Cortex®-M4F
Max Cores	8
Memory	Soldered down LPDDR4 memory, 64-bit interface, 1600MHZ. Base configuration 2GB, up-scalable to 4GB, 6GB, 8GB 2x Graphics accelerators Vivante GC7000 / VVSX or GC7000Lit /XVSX QuadMax and QuadPlus
Graphics	1x embedded VPU, supporting H.265 (4K30) and H.264 (1080p60) decoding and H.264 (1080p30) encoding Supports 3 independent video outputs (total combined resolution 4K)
Video Interfaces	OUTPUTS: HDMI 2.0a Tx interface Optional eDP 1.4 interface Optional Single/Dual-Channel 18-/24- bit LVDS interface INPUTS: HDMI 2.0a Rx interface 2x 4-lanes MIPI-CSI Camera interfaces
Video Resolution	HDMI: Up to UltraHD (4K) LVDS, eDP: up to 1080p
Mass Storage	eMMC 5.1 Drive soldered on-board, up to 64GB 1x S-ATA interface available on M.2 Socket 2 Key B Slot (interface shared with PCI-e x1) microSD Card Slot 4MB QuadSPI Flash NAND (boot device only)
Networking	2x Gigabit Ethernet interfaces Combo WiFi 802.11 a/b/g/n/ac + BT LE 4.2 module with ceramic SMT antennas on-board M.2 Socket 2 Key B Slot for M.2 Modems M.2 Socket1 Key E Slot for WiFi + BT external modules
USB	1 x USB 3.0 Host port on Type-A socket 1x USB 2.0 OTG port on micro-AB socket 1x USB 2.0 Host port on external Type-A socket 1x USB 2.0 Host port on internal connector 2 x USB 2.0 ports available on M.2 Key B and Key E slots
PCI-e	2x PCI-e x1 ports, available on M.2 Socket 1 Key E and on M.2 Socket 2 Key B (pin shared with SATA interface) Slots
Audio	I2S Audio Codec HP + MIC interfaces, available on a single combo TRRS connector
Serial Ports	1x UART TTL 1x RS-232 / UART TTL configurable 1x RS-485 / RS-422 / UART TTL configurable 3x CAN interfaces
Other Interfaces	4x Analog Inputs 6x GPIOs SPI interface I2C interface Embedded additional RTC circuitry for lowest power consumption SIM dedicated slot
Power Supply	+12V <sub>dc</sub> ± 10%
Operating System	Wind River Linux Yocto Android
Operating Temperature*	0°C ÷ +60°C (Commercial version) -40°C ÷ +85°C (Industrial version)
Dimensions	146 x 102 mm (5,75" x 4,02")

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.

SBC

Pico-ITX SBC with Intel® Atom® X, Celeron® J / N and Pentium® N Series (formerly Apollo Lake)

x86 solution designed for IoT edge computing in harsh environments

ADLER



Processor	Intel® Atom™ <b>x5-E3930</b> Dual Core @1.3 GHz (Burst 1.8GHz), 2MB L2 Cache, 6.5W TDP Intel® Atom™ <b>x5-E3940</b> Quad Core @1.6 GHz (Burst 1.8GHz), 2MB L2 Cache, 9.5W TDP Intel® Atom™ <b>x7-E3950</b> Quad Core @1.6 GHz (Burst 2.0GHz), 2MB L2 Cache, 12W TDP Intel® Pentium® <b>N4200</b> Quad Core @1.1GHz (Burst 2.5GHz), 2MB L2 Cache, 6W TDP Intel® Celeron® <b>N3350</b> Dual Core @1.1GHz (Burst 2.4GHz), 2MB L2 Cache, 6W TDP Intel® Celeron® <b>J3455</b> , Quad Core @1.5GHz (Burst 2.3GHz), 2MB L2Cache, 10W TDP Intel® Celeron® <b>J3355</b> , Dual Core @2.0GHz (Burst 2.5GHz), 2MB L2Cache, 10W TDP
Max Cores	4
Max Thread	4
Memory	32-bit Single-/Dual-/Quad-Channel LPDDR4 soldered on-board, up to 2400 MT/s Max memory size 8GB
Graphics	Integrated Intel® HD Graphics 500 series controller with up to 18 Execution Units Three Independent displays supported HW decoding of HEVC(H.265), H.264, MVC, VP8, VP9, MPEG2, VC-1, WMV9, JPEG/MJPEG formats HW encoding of HEVC(H.265), H.264, MVC, VP8, VP9 and JPEG/MJPEG formats
Video Interfaces	HDMI connector Optional DP++ connector (combo with HDMI) LVDS connector
Video Resolution	HDMI: up to 3840x2160 @ 30Hz DP++: up to 4096x2160 @ 60Hz LVDS: up to 1920x1200 @ 60Hz
Mass Storage	Optional eMMC 5.0 drive on-board SATA Gen3 7p M connector SSD M.2 Socket 2 Key B lot, size 2260 / 3042 (excludes WWAN modules) microSD Card slot (combo with miniSIM slot)
Networking	Dual Gigabit Ethernet connector WWAN (modem) M.2 Socket 2 Key B 2260 / 3042 slot (excludes SSD interface) Connectivity M.2 Socket 1 Key E 2230 Slot for WiFi+BTLE modules
USB	USB 3.0 Dual Type-A connector Internal USB 2.0 Dual pin header
Audio	HD Audio Codec Line Out + Microphone + S/PDIF Out interfaces on internal pin header
Serial Ports	2 x RS-232/RS-422/RS-485 Serial ports on internal pin header
Other Interfaces	miniSIM slot for M.2 modems (combo with microSD slot) 8 x GPIOs connector FAN connector Switch / LED Front Header connector I2C + INT# + RST# signals for I2C Touch Screen controller on LVDS connector Optional TPM 2.0 on-board
Power Supply	+12V <sub>dc</sub> Cabled coin cell battery for RTC
Operating System	Windows 10 Enterprise (64-bit) Windows 10 IoT Core (32- / 64-bit) WindRiver Linux 64-bit Yocto (64-bit) Android (planning)
Operating Temperature*	0°C ÷ +60°C (Commercial version) -40°C ÷ +85°C (industrial version)
Dimensions	100 x 72 mm (3,93" x 2,83")

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.



SBC

3.5" SBC with Rockchip RK3399

The Right Balance of Graphic/Computing Performance and Cost

SOLON



Processor	Rockchip RK3399 processor, 2x Cortex®-A72 MP cores + 4x Cortex®-A53 MPCores, up to 1.8GHz, 64-bit architecture
Max Cores	2+4
Memory	Soldered-down LPDDR4 memory, up to 4GB total, 64-bit interface
Graphics	4-Core Mali-T860MP4 GPU OpenGL ES 1.1/2.0/3.0/3.1, OpenVG 1.1, OpenCL, DX11 support Embedded VPU, able to offer: <ul style="list-style-type: none"><li>H.265 10-bit, H.264 10-bit, VP9 8-bit 4Kx2K@60fps HW Decoding</li><li>MPEG-4/MPEG-2/VP8 1080p@60fps HW Decoding</li><li>H.264, VP8 1080p@30fps HW encoding</li></ul> Supports 2 independent video outputs
Video Interfaces	LVDS Single / Dual Channel interface eDP 1.3 interface HDMI 4K interface DP 1.2 interface on USB Type-C connector (alternate mode)
Video Resolution	HDMI, DP: Up to 4K x 2K @60Hz eDP: Up to 4096 x 2160 (4K) LVDS: Up to 1920 x 1080 @60Hz
Mass Storage	SPI Flash (alternative to CAN Controller #1) eMMC 5.1 Drive soldered on-board microSD slot
Networking	Up to 2 x Gigabit Ethernet ports Optional soldered on-board M.2 1216 WLAN 802.11 a/b/g/n/ac + BT 5.0 module Optional on-board LTE Modem
USB	1 x USB 3.0 Type-C port (Alternate mode with DP) 1x USB 3.0 Host port on Type-A socket 2 x USB 2.0 Host ports on Dual Type-A socket Up to 2 x USB 2.0 Host ports on internal pin header
Audio	Optional I2S Audio Codec w/ TRSS Jack (MicIn / Lineout)
Serial Ports	1x Debug UARTs Up to 2x RS-232 (factory options) Up to 2x RS-485 (factory options) Up to 2x CAN ports (factory options).
Other Interfaces	Optional 2x MIPI-CSI Camera connectors, 4-lanes CSI input each one miniSIM slot or eSIM for on-board optional modem I/O Connector #1 with I2C interface + 1x Open-Drain + (RS-232 or RS-485 - factory alternatives) I/O Connector #2 with 3xGPIOs + 1x PWM + (RS-232 or RS-485 or TTL UART - factory alternatives) Dedicated connector for I2C Touch Screen Controller Support Optional Ultra-low Power RTC (Alternative to CAN Controller #2) Optional SPI external interface (alternative to CAN Controller #1) Optional LED Driver Optional Trust Secure Element on-board
Power Supply	+12V <sub>dc</sub> ÷ +24 V <sub>dc</sub> RTC battery
Operating System	Linux Yocto Android (under development)
Operating Temperature*	0°C ÷ +60°C (Commercial Temperature range) -20°C ÷ +85°C (Extended Temperature range)
Dimensions	146 x 102 mm (3.5" form factor)

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.

SBC

3.5" SBC with NXP i.MX 8X

A new generation of cost effective solutions for multimedia and industrial IoT applications

ALBION



Processor	NXP i.MX 8M Family, based on Arm® Cortex®-A53 MPCore + Cortex-M4 core platform: <b>i.MX 8M Quad</b> - Quad core up to 1.5GHz <b>i.MX 8M QuadLite</b> - Quad core up to 1.5 GHz per core <b>i.MX 8M Dual</b> - Dual core up to 1.5 GHz per core
Memory	Soldered down DDR3L memory, up to 2GB
Graphics	Vivante GC7000Lite GPU, supporting OpenGL ES 1.1 / 2.0 / 3.0 / 3.1, Open CL 1.2 and Vulkan Dedicated VPU (not for QuadLite), supporting 4Kp60 HEVC/H.265 main and main 10 decoder, 4Kp60 VP9 decoder, 4Kp30 AVC/H.264 decoder, 1080p60 MPEG-2, MPEG-4p2, VC-1, VP8, RV9, AVS, MJPEG, H.263 decoder Dual Display support
Video Interfaces	embedded Display Port 1.4 connector (switched with HDMI) Optional LVDS interface Optional HDMI 1.4 / 2.0a interface (switched with eDP) 4-lane MIPI CSI Camera interface
Video Resolution	HDMI, eDP: up to 4096x2160 LVDS: up to 1920x1080
Mass Storage	Optional eMMC drive on-board, up to 16GB microSD Card slot
Networking	Optional WiFi ac/a/b/g/n + BT 5 module with onboard U.FL antenna connectors Gigabit Ethernet port M.2 Socket 2 2260 / 3042 Key B slot for WWAN modules (modem) USB Device on USB 2.0 micro-AB connector (interface shared with USB 3.0 port) USB 3.0 Type-A connector (interface shared with USB 2.0 micro-AB) Optional USB 2.0 internal T/S connector (excludes one USB 2.0 Type-A interface)
Audio	I2S Audio Codec Speaker + Microphone + Earphone interfaces on internal pin headers Line Out + Mic In combo TRRS audio jack Optional 10W for channel amplified Speaker connector
Serial Ports	RS-232 Serial port connector Debug UART on internal pin header CAN Port
Other Interfaces	microSIM slot for M.2 modems SPI interface I2C Touch Screen dedicated connector 8 x GPIOs connector SPI Connector
Power Supply	+12V <sub>dc</sub> Coin cell battery for RTC
Operating System	Linux Android
Operating Temperature*	0°C ÷ +60°C (Commercial version) -40°C ÷ +85°C (industrial version, only boards without optional WiFi module)
Dimensions	101.6 x 147 mm (4" x 5.78")

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.



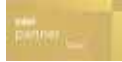


SBC

Embedded NUC™ SBC with  
Intel® Atom® X, Celeron® J / N and Pentium® N Series  
(formerly Apollo Lake)

Flexible and expandable full industrial  
x86 eNUC SBC

ALVIN



Processor	Intel® Atom™ <b>x5-E3930</b> Dual Core @1.3 GHz (Burst 1.8GHz), 2MB L2 Cache, 6.5W TDP Intel® Atom™ <b>x5-E3940</b> Quad Core @1.6 GHz (Burst 1.8GHz), 2MB L2 Cache, 9.5W TDP Intel® Atom™ <b>x7-E3950</b> Quad Core @1.6 GHz (Burst 2.0GHz), 2MB L2 Cache, 12W TDP Intel® Pentium® <b>N4200</b> Quad Core @1.1GHz (Burst 2.5GHz), 2MB L2 Cache, 6W TDP Intel® Celeron® <b>N3350</b> Dual Core @1.1GHz (Burst 2.4GHz), 2MB L2 Cache, 6W TDP Intel® Celeron® <b>J3455</b> , Quad Core @1.5GHz (Burst 2.3GHz), 2MB L2Cache, 10W TDP Intel® Celeron® <b>J3355</b> , Dual Core @2.0GHz (Burst 2.5GHz), 2MB L2Cache, 10W TDP
Max Cores	4
Max Thread	4
Memory	Quad Channel soldered down LPDDR4 memory, up to 8GB
Graphics	Integrated Intel® HD Graphics 500 series controller, with up to 18 Execution Units 4K HW decoding and encoding of HEVC(H.265), H.264, VP8, VP9, MVC Three independent display support Two DP++ 1.2 interfaces on miniDP connectors (supports HDMI displays through external adapter) embedded Display Port (eDP) internal connector LVDS through optional external adapter
Video Interfaces	DP: Up to 4096 x 2160 @60Hz eDP: Up to 3840 x 2160 @60Hz HDMI: Up to 3840 x 2160 @30Hz LVDS: Up to 1920 x 1200 @ 60Hz
Video Resolution	Optional eMMC drive onboard M.2 SATA SSD slot (Socket 2 Key B Type 3042/2260 **) microSD Card slot
Mass Storage	SATA 7p M connector
Networking	2x Gbit LAN / Intel Gigabit Ethernet i21x family controller M.2 WWAN Slot for Modems (Socket 2 Key B Type 3042/2260 **) M.2 WLAN Connectivity Slot for WiFi/BT (Socket 1 Key E type 2230) 2 x USB 3.0 Host ports on USB 3.0 Type-A sockets 2 x USB 2.0 Host ports on USB 2.0 Type-A sockets 2 x USB 2.0 Host ports on internal pin header 1 x USB 3.0 Host port on SSD/WWAN M.2 slot 1 x USB 2.0 Host port on WLAN M.2 slot
USB	1 x PCI-e x2 port on M.2 SSD/WWAN Slot 1 x PCI-e x1 port on WLAN M.2 Slot HD Audio codec / Cirrus Logic CS4207 Mic In and Line Out Audio jacks Amplified Speaker output on internal pin header
PCI-e	2 x RS-232/RS-422/RS-485 UARTs software configurable, on internal Pin Header
Audio	2 x I2C + 8 x GPIOs on Feature connector Button / LED front panel header CIR (Consumer InfraRed) sensor microSIM slot for M.2 WWAN Modem Optional TPM 2.0 on-board
Serial Ports	+18V <sub>DC</sub> ÷ +32 V <sub>DC</sub> recommended +15V <sub>DC</sub> ÷ +36 V <sub>DC</sub> absolute RTC battery
Other Interfaces	Microsoft® Windows 10 Enterprise (64 bit) Microsoft® Windows 10 IoT Core (64 bit) Linux
Power Supply	0°C ÷ +60°C (Commercial version) -40°C ÷ +85°C (Industrial version)
Operating System	0°C ÷ +60°C (Commercial version) -40°C ÷ +85°C (Industrial version)
Operating Temperature*	0°C ÷ +60°C (Commercial version) -40°C ÷ +85°C (Industrial version)
Dimensions	101.6 x 101.6 mm (4" x 4")

\* Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/ or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.  
\*\* SATA SSD and WWAN functionalities share the same slot and are therefore mutually exclusive.

SBC

SBC with NXP i.MX 6SoloX

All-in-one IoT hybrid computing solution

HAGAR



Processor	NXP <b>i.MX 6SoloX</b> , Single core Cortex®-A9 @ 1GHz + Cortex®-M4 core @ 227MHz
Max Cores	1 + 1
Memory	Soldered on-board DDR3L memory, 32-bit interface, up to 1GB
Graphics	Integrated Graphics Vivante GC400T, 2D and 3D HW accelerator OpenGL ES 2.0, OpenGL ES 1.1, OpenVG 1.1 supported
Video Interfaces	Single Channel 18-/24- bit LVDS connector + Touch Screen (I2C signals) 24-bit Parallel RGB Connector
Video Resolution	LVDS: up to 1366x768 @60Hz, 24bpp RGB: up to 1920x1080p @60Hz, 24bpp
Mass Storage	16MB NOR Quad-SPI Flash soldered onboard µSD Card slot Optional eMMC drive soldered on-board, up to 8GB
Networking	Up to 2x Fast Ethernet RJ-45 connectors Optional WiFi (802.11 b/g/n) + BT LE combo module + antenna onboard
USB	1 x USB 2.0 OTG port 3 x USB 2.0 Host port on standard Type-A socket 1 x USB 2.0 Host port on internal pin header
Audio	I2S Audio interface on programmable pin header S/PDIF interface (In and Out) on programmable pin header
Serial Ports	1 x CAN Port reconfigurable as GPIO 2x RS-232 (Tx/RX signals only) + 1x RS-485 serial ports on expansion pin header
Other Interfaces	2 x I2C dedicated connectors (one reserved for Touch Screen) 6 analog inputs for A/D Conversion Programmable (*) expansion pin header connector, able to offer: • CSI interface input (PAL and NTSC formats supported) • Up to 20 GPIO • SPI interface • SPDIF Audio interface • I2S Audio interface • CAN interface (TTL level) • 5 x PWM • 3 x I2C • 3 x serial ports (2x RS-232 +1xRS-485 interface)
Integrated Sensors	Embedded Low Power RTC (*) Please note that some of these interfaces are factory options, other configurations are made via SW using the pin multiplexing possibilities of the i.MX6SX processor.
Power Supply	Optional 9-Axis Motion Sensors (Accelerometer, Magnetometer and Digital Gyroscope) +12V <sub>DC</sub> nominal voltage +3V <sub>DC</sub> cabled Coin Cell Battery
Operating System	Linux Yocto
Operating Temperature*	0°C ÷ +60°C (Commercial version) -40°C ÷ +85°C (Industrial version)
Dimensions	89.5 x 87 mm (3.52" x 3.43")

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/ or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.

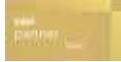


SBC

Embedded NUC™ SBC with  
N-series Intel® Pentium® / Celeron® and  
x5-Series Atom®

Multifunctional SBC on the eNUC form factor

NOLAN



Processor	Intel® Pentium® <b>N3710</b> , Quad Core @ 1.6GHz (Turbo Boost 2.56GHz), 2MB Cache, 6W TDP Intel® Celeron® <b>N3160</b> , Quad Core @ 1.6GHz (Turbo Boost 2.24GHz), 2MB Cache, 6W TDP Intel® Celeron® <b>N3060</b> , Dual Core @ 1.6GHz (Turbo Boost 2.48GHz), 2MB Cache, 6W TDP Intel® Celeron® <b>N3010</b> , Dual Core @ 1.04GHz (Turbo Boost 2.24GHz), 2MB Cache, 4W TDP Intel® Atom™ <b>x5-E8000</b> , Quad Core @ 1.04GHz (Turbo Boost 2.00GHz), 2MB Cache, 5W TDP
Max Cores	4
Max Thread	4
Memory	2 x DDR3L SO-DIMM Slots with Dual Channel Support, up to 8GB DDR3L-1600
Graphics	Integrated Graphics Three independent display support HW decoding of HEVC(H.265), H.264, MPEG2, MVC, VC-1, VP8, WMV9, JPEG/MJPEG formats HW encoding of H.264, MVC and JPEG/MPEG formats
Video Interfaces	HDMI connector miniDP++ connector embedded Display Port (eDP) internal connector
Video Resolution	HDMI, DP: up to 3840x2160 24bpp @30Hz, 2560x1600 24bpp @60Hz eDP: up to 2560x1440 24bpp @60Hz
Mass Storage	Optional eMMC drive on-board M.2 SATA SSD slot (Socket 2 Key B Type 2242 or 2260) microSD Card slot SATA 7p M connector
Networking	2 x Gigabit Ethernet ports
USB	2 x USB 3.0 Host ports on Type-A sockets 2 x USB 2.0 Host ports on internal pin header 1 x USB 2.0 Host port on M.2 Connectivity Slot
PCI-e	1 x PCI-e x1 port on M.2 Connectivity Slot
Audio	Audio available on HDMI and miniDP++ interfaces HD Audio codec Combo TRRS connector with LineOut and MicIn support
Serial Ports	2 x RS-232 / RS-422 / RS-485 UARTs, on internal Pin Header
Other Interfaces	I2C Touch Panel connector Front Panel Pin Header CIR (Consumer InfraRed) sensor 8 x GPIOs
Power Supply	+18V <sub>DC</sub> ÷ +32V <sub>DC</sub> recommended +15V <sub>DC</sub> ÷ +36V <sub>DC</sub> absolute RTC Battery
Operating System	Microsoft® Windows 7 (32 / 64 bit) Microsoft® Windows 8.1 (32 / 64 bit) Microsoft® Windows 10 (32 / 64 bit) Microsoft® Windows 10 IoT Linux Yocto
Operating Temperature*	0°C ÷ +60 °C
Dimensions	101.6 x 101.6 mm (4" x 4")

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/ or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.

SBC

SBC with NXP i.MX 6 Processor

Flexible, Open-source, Industrial SBC

DORIS



Processor	NXP i.MX 6 Family, based on Arm Cortex-A9 processors: <b>SBC-A62-J-SOLO</b> : Single Core (i.MX6S) @1GHz <b>SBC-A62-J-LITE</b> : Dual Core Lite (i.MX6DL) @1GHz <b>SBC-A62-J-PLUS</b> : Dual Core Plus (i.MX6DP) @1GHz <b>SBC-A62-J-QUAD</b> : Quad Core (i.MX6Q) @1GHz
Max Cores	4
Memory	Soldered on-board DDR3L memory***: SBC-A62-J-SOLO: 512MB 32-bit interface SBC-A62-J-LITE: 1GB 64-bit interface SBC-A62-J-PLUS: 2GB 64-bit interface SBC-A62-J-QUAD: 1GB 64-bit interface
Graphics	Integrated Graphics, with up to 3 separate HW accelerators for 2D, OpenGL® ES2.0 3D OpenVG™ accelerator (only SBC-A62-J-PLUS and SBC-A62-J-QUAD) HW encoding of MPEG-4, H.263 V2, H.264, MJPEG HW decoding of MPEG-2, VC1, MPEG-4 / XviD, H.263, H.264, DivX SBC-A62-J-SOLO and SBC-A62-J-LITE support up to 2 independent displays SBC-A62-J-PLUS and SBC-A62-J-QUAD support up to 3 independent displays
Video Interfaces	1 x Dual Channel or 2 x Single Channel 18 / 24 bit LVDS interface HDMI interface 1.4
Video Resolution	HDMI: up to 1920 x 1080p LVDS: up to 1920 x 1200
Mass Storage	4GB eMMC drive soldered on-board*** microSD Card slot SBC-A62-J-PLUS and SBC-A62-J-QUAD: SATA connector
Networking	Gigabit Ethernet connector Internal USB connector for Wi-Fi Module
USB	2 x USB 2.0 Type-A ports and 1 x USB 2.0 internal connector USB micro-B Client port
Audio	SBC-A62-J-LITE, SBC-A62-J-PLUS and SBC-A62-J-QUAD: AC'97 Audio Codec Realtek ALC655 with Mic-In, Line-Out audio Jacks Debug UART interface, TTL voltage level. SBC-A62-J-LITE, SBC-A62-J-PLUS and SBC-A62-J-QUAD: dedicated CAN Bus connector (Transceiver CAN 3.3V) Other serial interfaces on the expansion connector: SBC-A62-J-SOLO: 1 x Serial (TTL level) - 2 x Serial (RS-232) - 2 x CAN (TTL level); SBC-A62-J-LITE: 1 x Serial (TTL level) - 2 x Serial (RS-232) - 1 x CAN (TTL level); SBC-A62-J-PLUS and SBC-A62-J-QUAD: 1 x Serial (RS-485) - 2 x Serial (RS-232) - 1 x CAN (TTL level)
Serial Ports	Dedicated connector (I2C, GPIO signals) for external Touch Screen controller; MIPI-CSI Camera connector; Configurable* expansion connector with: Up to 28 GPIO - SPI interface - SPDIF Audio interface - CAN interface (TTL level) - SDIO interface - 3 x PWM - I2C - UARTs
Other Interfaces	+12V <sub>DC</sub> ; Additional embedded Low Power RTC; SBC-A62-J-SOLO and SBC-A62-J-LITE: internal i.MX6 Real Time Clock (external battery required for time/date retention, not included) SBC-A62-J-PLUS and SBC-A62-J-QUAD: low power Real Time Clock with onboard battery
Power Supply	Free Android and Linux community BSP available at UD00.org SECO Android (under development) and Linux BSP / WEC7 on request. Please contact us Yocto Guideline valid for SECO BSP
Operating System	Linux
Operating Temperature*	0°C ÷ +60 °C (Commercial temp.) For Industrial temp. (-40°C ÷ +85°C) please contact us
Dimensions	110 x 86.5 mm (4.5" x 3.7")

\* Please note that some of these interfaces are factory options, other configurations are made via SW.  
\*\* Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/ or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.  
\*\*\* For additional configurability please contact us.





SBC

Pico-ITX SBC with  
Intel® Atom® E3800 (formerly Bay Trail)

Limitless Embedded applications

LAMPoS



Available in Industrial  
Temperature Range

Processor	Intel® Atom™ <b>E3845</b> , Quad Core @1.91GHz, 2MB Cache, 10W TDP Intel® Atom™ <b>E3827</b> , Dual Core @1.75GHz, 1MB Cache, 8W TDP Intel® Atom™ <b>E3826</b> , Dual Core @1.46GHz, 1MB Cache, 7W TDP Intel® Atom™ <b>E3825</b> , Dual Core @1.33GHz, 1MB Cache, 6W TDP Intel® Atom™ <b>E3815</b> , Single Core @1.46GHz, 512KB Cache, 5W TDP Intel® Atom™ <b>E3805</b> , Dual Core @1.33GHz, 1MB Cache, 3W TDP
Max Cores	4
Max Thread	4
Memory	Up to 8GB on DDR3L-1333 ECC SO-DIMM Slot (DDR3L-1333 with E3845 and E3827, DDR3L-1067 the others)
Graphics	Integrated Intel® HD Graphics 4000 series controller (not for E3805) Dual independent display support HW decoding of H.264, MPEG2, MVC, VC1, VP8, MJPEG formats HW encoding of H.264, MPEG2 and MVC formats
Video Interfaces	HDMI connector Single / Dual Channel 18- / 24-bit LVDS connector
Video Resolution	HDMI, resolution up to 1080p @ 60Hz LVDS, resolution up to 1920 x 1200
Mass Storage	Optional eMMC drive on-board 1 x standard SATA connector mini mSATA interface on miniCard slot (shared with miniPCI-e) microSD Card slot
Networking	Dual Gigabit Ethernet connector
USB	2 x USB 3.0 Host ports on Dual Type-A socket 2 x USB 2.0 Host ports on internal pin header 1 x USB 2.0 Host port on miniPCI-e slot
PCI-e	Half miniPCI-e slot (shared with mSATA)
Audio	Optional HD Audio Codec Cirrus Logic CS4207 Mic In, Line out internal pin header connector
Other Interfaces	8 x GPIO FAN connector Switch / LED Front Header I2C connector with INT and RST# signals
Serial Ports	2 x optional RS-232 / RS-422 / RS-485 Serial ports on internal pin Header
Power Supply	12V <sub>DC</sub> ± 5% RTC Battery with lead cable and connector
Operating System	Microsoft® Windows 7 (32/64 bit) Microsoft® Windows 8.1 (32/64 bit) Microsoft® Windows 10 (32/64 bit) Microsoft® Windows 10 IoT Microsoft® Windows Embedded Standard 7 (32/64 bit) Microsoft® Windows Embedded Compact 7 Linux (32/64 bit) Yocto
Operating Temperature*	0°C ÷ +60°C (Commercial temperature) -40° ÷ +85°C (Industrial temperature)
Dimensions	72 x 100 mm (2.83" x 3.93")

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.

SBC

Modular SBC with NXP i.MX 8M Mini/Nano

Modularly expandable ready to use Single Board Computer (SBC)

SBCSOM by Keith & Koep



Processor	NXP i.MX 8M Mini Family based on ARM® Cortex®-A53 cores + general purpose Cortex®-M4 400MHz processor: i.MX 8M Mini Quad – Full featured, 4x Cortex®-A53 cores up to 1.8GHz i.MX 8M Mini Dual – Full featured, 2x Cortex®-A53 cores up to 1.8GHz i.MX 8M Mini Solo – Full featured, 1x Cortex®-A53 cores up to 1.8GHz i.MX 8M Mini Quad Lite Full featured, 4x Cortex®-A53 cores up to 1.8GHz i.MX 8M Mini Dual Lite – Full featured, 2x Cortex®-A53 cores up to 1.8GHz i.MX 8M Mini Solo Lite – Full featured, 1x Cortex®-A53 cores up to 1.8GHz
Memory	up tp 8 GB 32 bit LPDDR4
Graphics	GC320 2D accelerator + GCNanoUltra 3D accelerator Embedded VPU (not for Lite processors), able to offer: VP9, HEVC/H.265, AVC/H.264, VP8 HW Decoding AVC/H.264, VP8 HW encoding OpenGL ES 2.0, OpenVG 1.1 support
Video Interfaces	LVDS Single/Dual Channel connector HDMI
Video Resolution	Up to 1920x1080p60, 24bpp
Mass Storage	Onboard 4 Bit wide μSD Card Socket or onboard 8 Bit wide eMMC, eMMC
Networking	1x GbEthernet interfaces WLAN 2.4GHz/5Ghz, 802.11 a/b/g/n/ac 2x2 MU-MIMO / Bluetooth 5.0 mPCIe socket for modems
USB	1x USB 2.0 Type-C 1x USB 2.0 Type-A
Audio	Audio Codec
Other Interfaces	System Connector 1: Power-Supply, 2x UART or SPI, I2C, USB, SDIO, MIPI-DSI (4ch), MIPI-CSI (4ch), PCIe, GPIO (24) System Connector 2: Power-Supply, 2x UART, QSPI, I2C, USB, Speaker, Headphone, Line-In, Microphone, SPDIF, I2S, SIOP (Ethernet, fiber), GPIO (42) FFC Connectors: i-MOD UART (RS232/485), i-MOD USB/I2C, KUK-Modis (LVDS/MIPI), MIPI-CSI, Camera, Speaker
Power Supply	12 ÷ 24 VDC
Operating System	Windows 10 IoT Linux Debian Linux Yocto Android
Operating Temperature*	-40°C ÷ 85°C (Industrial), -25°C ÷ 85°C (Extended Consumer), 0 ÷ 70°C (Consumer)
Dimensions	95.0 x 73.0 x 20.0 mm

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.



SBC

SBC with NXP i.MX8M Mini

High performance with low power consumption for edge computing

TANARO CORE by Garz & Fricke



Processor	NXP i.MX 8M Mini Family based on ARM® Cortex®-A53 cores + general purpose Cortex®-M4 400MHz processor: i.MX 8M Mini Quad – Full featured, 4x Cortex®-A53 cores up to 1.8GHz i.MX 8M Mini Dual – Full featured, 2x Cortex®-A53 cores up to 1.8GHz i.MX 8M Mini Solo – Full featured, 1x Cortex®-A53 cores up to 1.8GHz i.MX 8M Mini Quad Lite Full featured, 4x Cortex®-A53 cores up to 1.8GHz i.MX 8M Mini Dual Lite – Full featured, 2x Cortex®-A53 cores up to 1.8GHz i.MX 8M Mini Solo Lite – Full featured, 1x Cortex®-A53 cores up to 1.8GHz
Memory	1 GB 32 bit LPDDR4
Graphics	GC320 2D accelerator + GCNanoUltra 3D accelerator Embedded VPU (not for Lite processors), able to offer: VP9, HEVC/H.265, AVC/H.264, VP8 HW Decoding AVC/H.264, VP8 HW encoding OpenGL ES 2.0, OpenVG 1.1 support
Video Interfaces	LVDS Single/Dual Channel connector MIPI-CSI Camera interface connector
Video Resolution	Up to 1920x1080p60, 24bpp
Mass Storage	eMMC: 4 GB MLC SD slot: 4 bit MMC/SDIO/SD/SDHC
Networking	1x GbEthernet interfaces 1x 100MbEthernet shielded single band WiFi 802.11 b/g/n with Bluetooth 4.0 mPCIe (half size) socket for modems
USB	1x USB 2.0 OTG micro-AB up to 2x USB 2.0 Type-A
Audio	1x speaker (connector), 1 W RMS (8Ω) parallel to internal speaker Digital Mic In connector (2x PDM inputs)
Serial Ports	2x RS-232, RS-485
Power Supply	9 ÷ 32 VDC
Operating System	Yocto
CAN Bus	1x CAN (ISO/DIS 11898)
Operating Temperature*	0°C ÷ +60°C
Dimensions	159.0 x 18.0 x 80.0 mm

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.

SBC

SBC with NXP i.MX6ULL

Optimized SBC for small sized HMI solutions

NALLINO CORE by Garz & Fricke



Processor	NXP i.MX 6 Family, based on ARM® CORTEX-A7 processors: i.MX6ULL 792 MHz
Memory	512 MB 32 bit DDR3L
Video Interfaces	24-bit parallel RGB interface
Video Resolution	Up to 1024 x 600, 24bpp
Mass Storage	eMMC: 4 GB MLC micro SD slot: 4 bit MMC/SDIO/SD/SDHC
Networking	1x 100MbEthernet
USB	1x USB 2.0 OTG micro-AB 1x USB 2.0 Type-A
Audio	1x speaker (connector), internal buzzer
Serial Ports	RS-232, RS-485
Power Supply	9 ÷ 32 V <sub>DC</sub>
Operating System	Yocto
CAN Bus	1x CAN (ISO/DIS 11898)
Operating Temperature*	0°C ÷ +60°C
Dimensions	113.0 x 18.0 x 47.0 mm

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.



SBC

SBC with **NXP i.MX6**

### Optimized SBC for small sized HMI solutions

**SANTINO LT CORE** by Garz & Fricke



Processor	NXP i.MX 6 Family, based on ARM® CORTEX-A9 processors: i.MX6S Solo - Single core up to 1 GHz i.MX6DL Dual Lite - Dual core up to 1 GHz per core
Memory	1 GB 32 bit DDR3L
Graphics	2D graphics accelerator OpenGL® ES 2.0 3D graphics accelerator with a shader
Video Interfaces	24-bit parallel RGB interface
Video Resolution	Up to 1024 x 600, 24bpp
Mass Storage	eMMC: 4 GB MLC micro SD slot: 4 bit MMC/SDIO/SD/SDHC
Networking	1x 100MbEthernet
USB	1x USB 2.0 OTG micro-AB 1x USB 2.0 Type-A
Audio	1x speaker (connector), 1 W RMS (8Ω) parallel to internal speaker
Serial Ports	RS-232, RS-485
Power Supply	9 ÷ 32 V <sub>DC</sub>
Operating System	Yocto
CAN Bus	1x CAN (ISO/DIS 11898)
Operating Temperature*	0°C ÷ +60°C
Dimensions	113.0 x 18.0 x 47.0 mm

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.



SBC

SBC with **NXP i.MX6**

### Optimized SBC for medium sized HMI solutions

**SANTINO CORE** by Garz & Fricke



Processor	NXP i.MX 6 Family, based on ARM® CORTEX-A9 processors: i.MX6S Solo - Single core up to 1 GHz i.MX6DL Dual Lite - Dual core up to 1 GHz per core
Memory	1 GB 32 bit LPDDR4
Graphics	2D graphics accelerator OpenGL® ES 2.0 3D graphics accelerator with a shader
Video Interfaces	18-bit parallel RGB interface
Video Resolution	Up to 1024 x 600, 18bpp
Mass Storage	eMMC: 4 GB MLC SD slot: 4 bit MMC/SDIO/SD/SDHC
Networking	1x 100MbEthernet
USB	1x USB 2.0 OTG micro-AB 1x USB 2.0 Type-A
Audio	1x speaker (connector), 1 W RMS (8Ω) parallel to internal speaker
Serial Ports	2x RS-232, RS-485
Power Supply	9 ÷ 32 V <sub>DC</sub>
Operating System	Yocto
CAN Bus	1x CAN (ISO/DIS 11898)
Operating Temperature*	0°C ÷ +60°C
Dimensions	138.0 x 18.0 x 80.0 mm

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.



SBC

SBC with **NXP i.MX6**

### Flexible, powerful all-rounder for any demanding applications

**SANTARO CORE** by Garz & Fricke



Processor	NXP i.MX 6 Family based on ARM® Cortex®-A9 cores : i.MX 6 Quad – Full featured, 4x Cortex®-A9 cores up to 1.0GHz i.MX 6 Dual – Full featured, 4x Cortex®-A9 cores up to 1.0GHz i.MX 6 Single – Full featured, 4x Cortex®-A9 cores up to 1.0GHz
Memory	1 GB 64 bit DDR3L
Graphics	Integrated Graphics, with up to 3 separate HW accelerators for 2D, OpenGL® ES2.0 3D OpenVG™ accelerator HW encoding of MPEG-4, H.263 V2, H.264, MJPEG HW decoding of MPEG-2, VC1, MPEG-4 / XviD, H.263, H.264, DivX
Video Interfaces	LVDS Single/Dual Channel connector HDMI interface
Video Resolution	Up to 1920x1080p60, 24bpp
Mass Storage	eMMC: 4 GB MLC SD slot: 4 bit MMC/SDIO/SD/SDHC
Networking	1x 100MbEthernet
USB	1x USB 2.0 OTG micro-AB 1x USB 2.0 Type-A
Audio	1x speaker (connector), 1 W RMS (8Ω) parallel to internal speaker
Serial Ports	2x RS-232, RS-485
Other Interfaces	2x Digital Input, 2x Digital Output
Power Supply	9 ÷ 32 V <sub>DC</sub>
Operating System	Yocto
CAN Bus	1x CAN (ISO/DIS 11898)
Operating Temperature*	0°C ÷ +60°C
Dimensions	159.0 x 18.0 x 80.0 mm

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.



SBC

SBC with **NXP i.MX6**

### Our IOT solution: PCIe interface for wireless connectivity and two Ethernet ports

**SANTOKA CORE** by Garz & Fricke



Processor	NXP i.MX 6 Family based on ARM® Cortex®-A9 cores : i.MX 6 Quad Plus – Full featured, 4x Cortex®-A9 cores up to 1.0GHz i.MX 6 Quad – Full featured, 4x Cortex®-A9 cores up to 1.0GHz i.MX 6 Dual – Full featured, 4x Cortex®-A9 cores up to 1.0GHz i.MX 6 Single – Full featured, 4x Cortex®-A9 cores up to 1.0GHz
Memory	1 GB 64 bit DDR3L
Graphics	Integrated Graphics, with up to 3 separate HW accelerators for 2D, OpenGL® ES2.0 3D OpenVG™ accelerator HW encoding of MPEG-4, H.263 V2, H.264, MJPEG HW decoding of MPEG-2, VC1, MPEG-4 / XviD, H.263, H.264, DivX
Video Interfaces	LVDS Single/Dual Channel connector HDMI interface
Video Resolution	Up to 1920x1080p60, 24bpp
Mass Storage	eMMC: 4 GB MLC SD slot: 4 bit MMC/SDIO/SD/SDHC
Networking	2x 100MbEthernet mPCIe (half size) socket for modems or Wifi/BT
USB	1x USB 2.0 OTG micro-AB up to 2x USB 2.0 Type-A
Audio	1x speaker (connector), 1 W RMS (8Ω) parallel to internal speaker
Serial Ports	2x RS-232, RS-485
Power Supply	9 ÷ 32 V <sub>DC</sub>
Operating System	Yocto
CAN Bus	1x CAN (ISO/DIS 11898)
Operating Temperature*	0°C ÷ +60°C
Dimensions	159.0 x 18.0 x 80.0 mm

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.





SBC

SBC with **NXP i.MX6**

Vending / IOT platform with 3G / 4G modem and MDB interfaces

**SANTVEND CORE** by Garz & Fricke



	Processor	NXP i.MX 6 Dual up to 1 GHz; based on ARM® Cortex®-A9 cores
	Memory	2 GB 32 bit DDR3L
	Graphics	Integrated Graphics, with up to 3 separate HW accelerators for 2D, OpenGL® ES2.0 3D OpenVG™ accelerator HW encoding of MPEG-4, H.263 V2, H.264, MJPEG HW decoding of MPEG-2, VC1, MPEG-4 / XviD, H.263, H.264, DivX
	Video Interfaces	LVDS Single/Dual Channel connector HDMI interface
	Video Resolution	Up to 1920x1080p60, 24bpp
	Mass Storage	eMMC: 4 GB MLC micro SD slot: 4 bit MMC/SDIO/SD/SDHC
	Networking	1x 100MbEthernet 2G/3G/4G GPS Modem Bluetooth BLE
	USB	1x USB 2.0 Type-A
	Audio	1x speaker (connector), 1 W RMS (8Ω)
	Serial Ports	1x RS-232
	Power Supply	10 ÷ 42 VDC
	Operating System	Yocto
	CAN Bus	1x CAN (ISO/DIS 11898)
	Operating Temperature*	0°C ÷ +60°C
	Dimensions	160.0 x 18.0 x 95.0 mm

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/ or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.

SBC

IoT Sensor to Cloud with **ESP32-D0WDQ6**

From sensors to Cloud in a single step

**SCORPIUS**



Available in Industrial Temperature Range

	Processor	ESP32-D0WDQ6 processor, Dual Core Xtensa® 32-bit LX6 Microprocessor
	Memory	Internal 520KB SRAM + 16KB SRAM in RTC
	Graphics	N.A.
	Mass Storage	4MB SPI Flash 8MB PSRAM Optional microSD slot (alternative to Expansion PCB-terminal block #2)
	Networking	Embedded WiFi (802.11 b/g/n) + BT 4.2/BT LE module with PCB antenna
	Serial Ports	Optional 4-wire TTL port on 5-pin dedicated PCB Terminal Block
	CAN	Optional CAN Port on 3-pin dedicated PCB Terminal Block
	Other Interfaces	Expansion 10-/11-pin PCB terminal block #1, able to manage: Up to 9 digital GPIOs (5 managed in UltraLow Power States too) Up to 5x analog Inputs Up to 2x DAC outputs SPI interface Expansion 8-pin PCB terminal block #2 (alternative to microSD Slot), able to manage: Up to 6x digital GPIOs, all managed in UltraLow Power States too Up to 6x analog Inputs Up to 6x Capacitive Sensing GPIOs SPI JTAG interface SD Host interface SD Slave interface 3x Pushbuttons Green LED for Power On Signaling Blue LED for Edgehog network connection signaling Yellow LED for WiFi/BT activity or other signaling
	Power Supply	PCB Terminal Block +9V <sub>DC</sub> ... +24V <sub>DC</sub>
	Operating Temperature	-40°÷+85°C (Industrial Temperature range)
	Dimensions	4x8 cm



Development Kits for Rapid POC

SBC with **Intel® Celeron®** and **Pentium®**

The Next-Gen Intel® X86 II Open Hardware SBC

**UDOO X86 II**



	Processor	Intel® Pentium® N3710, Quad Core @ 1.6GHz (Turbo Boost 2.56GHz), 2MB Cache, 6W TDP  Intel® Celeron® N3160, Quad Core @ 1.6GHz (Turbo Boost 2.24GHz), 2MB Cache, 6W TDP
	Memory	DDR3L soldered-down memory up to 8GB RAM dual channel
	Graphics	Intel HD Graphics Gen 8 LP Up to 700 MHz Up to 16 execution units Three independent display support HW decoding of HEVC(H.265), H.264, MPEG2, MVC, VC-1, VP8, WMV9, JPEG/MJPEG formats HW encoding of H.264, MVC and JPEG/MPEG formats
	Video Interfaces	HDMI connector 1.4 2 x miniDP++ connector
	Video Resolution	up to 3840x2160 24bpp @30Hz, 2560x1600 24bpp @60Hz
	Mass Storage	32GB eMMC 5.0 High Speed Drive M.2 SATA SSD slot (Socket 2 Key B Type 2242 or 2260) microSD Card slot SATA 7p M connector
	Networking	1x Gigabit Ethernet RJ45 connector Slot M.2 Socket 1 Key E 2230 for optional WiFi/BT combo
	USB	3 x USB 3.0 Type-A socket
	Audio	HD Audio codec Line Out + Mic In combo TRRS audio jack S/PDIF output Preamplified Stereo Speaker (up to 3W)
	Serial Ports	2 x UART
	Other Interfaces	Intel® Curie™ module (Quark SE core 32 MHz plus 32-bit ARC core 32 MHz) features Bluetooth LE, 6-axis accelerometer/gyro Arduino Leonardo-Compatible I/O: - 12x analog inputs - Up to 23 Digital I/O (7 PWM) - 1 x UART, 1 x I2C, 1 x SPI 2x HSUART ports 2x I2C interface 1x SDIO interface 1x LPC interface
	Other	IR receiver (RC5 compatible), RTC battery
	Power Supply	+12VDC, DC Power Jack
	Operating System	Linux Windows Android
	Operating Temperature*	0°C ÷ +70°C
	Dimensions	120 x 85 mm (4.72" x 3.35")

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/ or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.

Development Kits for Rapid POC

UDOO X86 in **Pico-ITX** form factor

Pico-ITX Single Board Computer for Computer Vision applications and rapid prototypes

**UDOO VISION**



	Processor	<b>Intel® Atom® x7-E3950</b> Quad Core @1.6 GHz (Burst 2.0GHz), 2MB L2 cache, 12W TDP <b>Intel® Atom® x5-E3940</b> Quad Core @1.6 GHz (Burst 1.8GHz), 2MB L2 cache, 9W TDP <b>Intel® Pentium® N4200</b> Quad Core @1.1GHz (burst 2.5GHz), 2MB L2 cache, 6W TDP <b>Intel® Celeron® N3350</b> Dual Core @1.1GHz (burst 2.4GHz), 2MB L2 cache, 6W TDP
	Max Cores	4
	Max Thread	4
	Memory	32-bit single-/dual-/quad-channel LPDDR4 soldered on-board, up to 2400 MT/s Max memory size 8GB
	Graphics	Integrated Intel® HD Graphics 500 series controller with up to 18 Execution Units HW decoding of HEVC(H.265), H.264, VP8, VP9, MPEG2, VC-1, WMV9, JPEG/MJPEG formats HW encoding of HEVC(H.265), H.264, MVC, VP8, VP9 and JPEG/MPEG formats Three independent display supported
	Video Interfaces	Multimode DP++ on MiniDP connector eDP on socket header connector
	Video Resolution	DP: up to 4096x2160 @ 60Hz HDMI: up to 3840x2160 @ 30Hz eDP: up to 3840x2160 @ 60Hz
	Mass Storage	eMMC 5.1 drive on-board, up to 64GB SATA Gen3 7p M connector SSD M.2 Socket 2 Key B lot, size 2260 / 3042 (excludes WWAN modules) microSD Card slot (combo with miniSIM slot)
	Networking	Dual Gigabit Ethernet connector WWAN (modem) M.2 Socket 2 Key B 2260 / 3042 slot (excludes SSD interface) Connectivity M.2 Socket 1 Key E 2230 slot for Wi-Fi+BTLE modules
	USB	USB 3.0 Dual Type-A connector Internal USB 2.0 Dual pin header
	Audio	HD audio codec Line out + microphone on TRSS connector
	Serial Ports	2x RS-232/RS-422/RS-485 Serial ports on internal pin header
	Other Interfaces	miniSIM slot for M.2 modems (combo with microSD slot) 8x GPIOs connector FAN connector Buttons / activity LED front panel header connector Optional TPM 2.0 on-board ATMEL ATmega32u4 microcontroller with Arduino Leonardo compatible header
	Power Supply	+12V <sub>DC</sub> Cabled coin cell battery for RTC
	Operating System	Windows 10 Enterprise (64-bit) Windows 10 IoT Core Linux LTS (64-bit) Yocto (64-bit)
	Operating Temperature*	0°C to +60°C (Commercial temperature range)
	Dimensions	100 x 72 mm (3,93" x 2,83")

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/ or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.



## SBC with AMD Embedded Ryzen™ V1000B

## Raising the Maker World to the Next Level

## UDOO BOLT



Processor	AMD Ryzen™ Embedded V1202B with GPU AMD Radeon™ Vega 3, dual core dual thread @ 2.3GHz (3.2 Boost), TDP 12-25W
Memory	AMD Ryzen™ Embedded V1605B with GPU AMD Radeon™ Vega 8, quad core dual thread @ 2.0GHz (3.6 Boost), TDP 12-25W 2 x DDR4 ECC and non-ECC SODIMM slots, support DDR4-2400 memories up to 32GB total
Graphics	GPU AMD Radeon™ VEGA with up to 8 Compute Units DirectX® 12 supported H.265 (10-bit) decode and 8-bit video encode VP9 decode 4 independent displays supported
Video Interfaces	2 X HDMI 1.4 / 2.0A 2 X DP Alternate Mode on USB Type-C
Video Resolution	Up to 4K
Mass Storage	32GB eMMC 5.0 High Speed Drive Optional SSD SATA module slot M.2 Key B 2260 Optional NVMe module slot M.2 Key M 2280 SATA 3.0 6 Gbps standard connector
Networking	1x Gigabit Ethernet RJ45 connector Slot M.2 Socket 1 Key E 2230 for optional Wi-Fi/BT combo
USB	2 x USB 3.0 Type-A socket 2 x USB 3.1 Gen2 Type-C connector (alternate mode with DP), Dual Role Port (DRP), USB Power Delivery (USB-PD) 3.0
Audio	HD Audio codec Line Out + Mic In combo TRRS audio jack 3.5" connector S/PDIF Optical + Stereo Out Preamplified Stereo Speaker (up to 3W)
Serial Ports	2 x UART
Other Interfaces	Arduino Leonardo-Compatible I/O: - 12x analog inputs - Up to 23 Digital I/O (7 PWM) - 1 x UART, 1 x I2C, 1 x SPI  3 x GROVE Connectors: - 1 x Analog Input - 1 x UART or Digital I/O - 1 x I2C or Digital I/O  EMBEDDED CONTROLLER I/O: - 2 x UART - 2 x I2C - 1 x SPI - WAKE# signal - 1 x Keyboard Scan - 1 x Fan Controller - 16 x GPIO
Other	IR receiver (RC5 compatible), RTC battery
Power Supply	+19VDC (60W), DC Power Jack USB Type-C Power Delivery sink profile 20V/3A(60W)
Operating System	Linux Windows 10 64bit
Operating Temperature*	0°C ÷ +70°C
Dimensions	120 x 120 mm

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.

## Boxed solution with AMD Embedded Ryzen™ V1605B

## The Speed Force turned Mini PC

## UDOO BOLT GEAR



Processor	AMD Ryzen™ Embedded V1605B with GPU AMD Radeon™ Vega 8, Quad Core Dual Thread @ 2.0GHz (3.6 Boost), TDP 12-25W
Memory	2 x DDR4 ECC and non-ECC SODIMM Slots, Support DDR4-2400 memories up to 32GB total
Graphics	GPU AMD Radeon™ VEGA 8 with 8 Compute Units DirectX® 12 supported H.265 (10-bit) decode and 8-bit video encode VP9 decode 4 independent displays supported
Video Interfaces	2 X HDMI 1.4 / 2.0A 2 X DP AAlternate Mode on USB Type-C
Video Resolution	Up to 4K
Mass Storage	Optional SSD SATA Module slot M.2 Key B 2260 Optional NVMe Module slot M.2 Key M 2280 SATA 3.0 6 Gbps standard connector on external panel
Networking	1x Gigabit Ethernet RJ45 connector Slot M.2 Socket 1 Key E 2230 for optional WiFi/BT combo
USB	2 x USB 3.0 Type-A socket 2 x USB 3.1 Gen2 Type-C connector (alternate mode with DP), Dual Role Port (DRP), USB Power Delivery (USB-PD) 3.0
Audio	HD Audio codec Line Out + Mic In combo TRRS audio jack 3.5" connector S/PDIF Optical + Stereo Out Preamplified Stereo Speaker (up to 3W) on internal connectors
Serial Ports	2 x UART
Other Interfaces	Arduino Leonardo-Compatible I/O: - 12x analog inputs - Up to 23 Digital I/O (7 PWM) - 1 x UART, 1 x I2C, 1 x SPI  3 x GROVE Connectors: - 1 x Analog Input - 1 x UART or Digital I/O - 1 x I2C or Digital I/O  EMBEDDED CONTROLLER I/O: - 2 x UART - 2 x I2C - 1 x SPI - WAKE# signal - 1 x Keyboard Scan - 1 x Fan Controller - 16 x GPIO
Other	Metal enclosure with VESA mounting holes, IR receiver (RC5 compatible), RTC battery
Power Supply	+19VDC (60W), DC Power Jack USB Type-C Power Delivery sink profile 20V/3A(60W)
Operating System	Linux Windows 10 64bit
Operating Temperature*	0°C ÷ +70°C
Dimensions	130 x 130 x 70 mm

\*Measured at any point of SECO standard heatspreader for this product, during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider application-specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.

AI Platform with  
Raspberry Pi RP2040, ESP32 and Clea AIFully programmable board made for AI  
applications and rapid prototypes

## UDOO KEY



Processor	ESP32-D0WDQ6 processor, Dual Core Xtensa® 32-bit LX6 Microprocessor and RP2040
Memory	Internal 520KB SRAM + 16KB SRAM in RTC
Mass Storage	16MB SPI Flash (on ESP32) 8MB PSRAM (on ESP32) 8MB Flash (on RP2040) 264kB SRAM (on RP2040)
Networking	Embedded Wi-Fi (802.11 b/g/n) + BT 4.2/BT LE module with PCB antenna
USB	USB 2.0 on Type-C connector for serial communication and programming of ESP32 or RP2040
Other Interfaces	Interfaces on UEXT connector: • +3.3V / GND • 1x UART (from ESP32) • 1x I2C (from ESP32) • 1x SPI (from ESP32)  On RP2040 header: • 24x GPIOs
Other	1x 6-axis Inertial Measurement Unit (IMU) 1x PDM microphone 2x programmable LEDs
Power Supply	+5V <sub>DC</sub> , USB Type-C connector
Operating Temperature	0° to +60°C
Dimensions	130 x 40 x 10.9 mm







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